

Transmission

BOTH the main and counter shafts of transmission should be examined occasionally to see that the ball bearings are in good condition. The case should be cleaned occasionally by removing the drain plug in the bottom and flushing with gasoline, then refilling with a mixture of good, clean, hard grease and a little oil.

The adjusting rings at the ends of the shafts for adjusting the play lengthwise of the bearings must not be screwed up so tight as to pinch the bearings, as these annular type bearings require some side play.

On Model 40 the speed reductions within the transmission are as follows:

1st speed forward 1 to 3.31,

2nd speed forward 1 to 1.67,

3rd speed forward 1 to 1 (direct drive),

Reverse 1 to 4.68.

On all these models the standard ratio of the driving gears in the rear system is practically 3 to 1, although special gears are furnished at times on special order. The different gears and pinions being, 13 or 14 or 15-tooth pinion with 45-tooth gear for touring cars; 16-tooth pinion with 45-tooth gear for toy tonneau and 17-tooth or 18-tooth pinion with 45-tooth gears for roadsters.

Ignition System on Roadsters

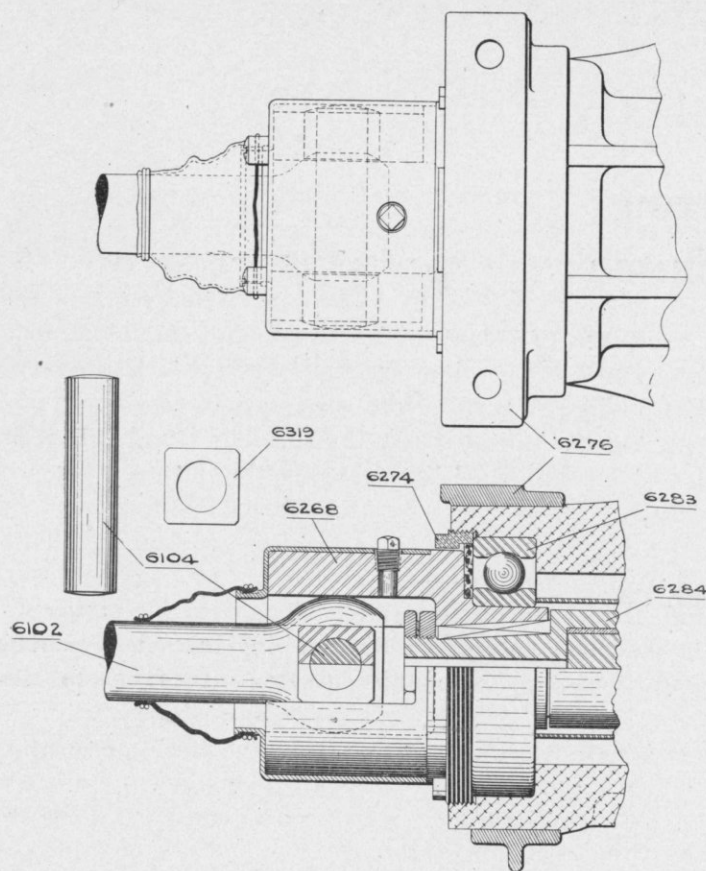
WHEN specified the ignition system on roadsters is the same as on the touring cars. Otherwise the system used consists of a Splitdorf double distributor magneto with a Splitdorf coil on dash and two sets of plugs. This system is so arranged that when switch on coil is turned to battery, the cylinders fire on both sets of plugs from battery; also when switch is thrown to magneto both sets of plugs fire simultaneously.

The Clutch

THE cone clutch which drives the car, with the exception of being oiled occasionally, should require very little attention. Should it show a tendency to slip at any time see that the clutch is properly engaging and that one of the foot pedals is not holding it out. (Note the instructions for adjusting the clutch given in the "Controller System.") If the clutch continues to slip after it is found that it is properly engaging, tighten the spiral spring 6203 which is accomplished by loosening the nut on taper pin and screwing up the clutch stud.

The removal of the clutch is only necessary when the leather on its face requires replacing. This leather with the eight flat springs under it should last at least one season.

To remove the clutch, first release the spiral spring, then take off the clutch shaft 6161 by removing clutch shaft brackets. The clutch coupling 6200 should then be removed by disengaging bolts which hold the coupling to the clutch hub and to the transmission coupling. After disconnecting these parts the clutch slides out without disturbing the transmission.



The Universal Joint

The sliding universal joint situated back of transmission consists of a main steel portion attached to the shaft of the transmission by two keys.

This main part of joint is held on the stationary tooth clutch 6284 by two nuts and revolves on the annular bearing 6283.

The driving shaft 6102 turned to a ball shape at one end has the hardened pin 6104 running through it, upon which work the two steel squares 6319 sliding in slots in the main portion of the joint, thus permitting a perfect universal motion, and also the sliding fore and aft movement of the driving shaft due to the action of the springs. There is a tubular sleeve which encloses the working parts of this joint. Moving back the sleeve allows for the removal of the squares and the packing of the joint with grease. The end of the joint is covered by a rawhide boot fastened at one end to the sleeve and at the other end to the drive shaft. A small hole through the center of the shaft of tooth clutch allows some oil to flow into the joint from the transmission case.

Steering

THE steering wheel operates an adjustable steering chuck consisting of a worm gear and sector; the shaft of sector has a steering arm attached to its outside end. The latter connects by a ball and socket jointed fore and aft rod, to the arm on the right steering knuckle.

A cross connecting rod ties the steering knuckles together. Care should be used to see that the connections on these rods are kept adjusted and that nuts and bolts are tight.

The bolts holding springs and other parts are secured with nuts and cotter pins and should be gone over occasionally to see that they are tight, there being much less wear on a tight than a loose bolt.

Brakes

TWO sets of brakes acting on the hubs of the rear wheels are provided, one an internal expanding metal to metal brake operated by the foot pedal, the other an external contracting brake operated by the emergency hand brake lever. Application of the foot brake also disengages the clutch. The brake shaft should be kept well oiled, also the metal brake should be oiled occasionally and examined to see that the adjustment is correct and that the clutch is properly drawn when the brakes are applied. The ordinary adjustment of the brakes is made by the turnbuckles on the brake rods. However, the external brake bands can also be adjusted. The external band is taken up by shortening the adjuster on this band. The grease cups on brake shields should be given a turn occasionally as a slight amount of grease will prevent brakes squeaking.

Rear System

THE rear system should require but little attention. It is well to jack it up occasionally and after taking off the dust caps and pulling out the inner squared axles, examine the adjustment of the wheels and their roller bearings, which run on the outer ends of the axle casing. The bearings of each wheel are held on by two nuts on the ends of the tubing and have a lock washer between them. These nuts should be kept tight. About every six weeks the wheels should be taken off entirely, the bearings examined and repacked with light cup grease. The bearings should be adjusted with a slight amount of play.

Every week or so the nuts on the forward end of the drive shaft should be inspected. These must not be drawn too tight or they will pinch the bearings, it being better to allow a slight play.

After a few weeks' run, the differential and driving gears should be inspected by removing the cover of the gear case. If it is found that the bevel gear is not meshing into the pinion sufficiently, the nuts or adjusting collars between differential and bearing should be tightened slightly. While the case is open remove the drain plug in bottom, thoroughly flush out with gasoline and refill with heavy grease and oil.

The castellated nut at pinion end of the drive shaft is not for adjusting purposes but simply to hold the pinion in place.

To remove the bevel gear and differential it is necessary to take off the two caps holding the differential bearings in the gear case and withdraw the two inner axles.

It will be noticed that the swivel hub front bearing support of drive shaft is loose on the drive shaft tubing. If this joint should become rusty or bind it would subject the drive shaft tubing to a severe, twisting strain, therefore, care should be taken to see that it is properly oiled by keeping the grease cup filled and turning it down occasionally.

Troubles and Their Remedies

1. *INADEQUATE LUBRICATION* is the most detrimental, and the utmost care should be used to see that the proper supply of oil is carried at all times and that all parts, such as the clutch and its bearings, steering connections, steering chuck, universal joint, etc., are properly oiled. Inadequate lubrication can be first noticed in the engine by a knocking sound and by a loss of power.

2. *FLOODING OF CARBURETOR*. This will be indicated by the stopping of the engine when running, or by gasoline running out of the carburetor when standing still, and is due to float sticking and its not closing the inlet valve to carburetor. It can be easily remedied, however, by taking off the carburetor, which is done by the removal of two cap screws on top of it. The float can then be seen and its sticking will probably be due to its binding on one side, it not being central. This can be remedied by loosening the screw in center of float and moving the cork slightly to one side or the other. It may also be due to dirt under the inlet valve of carburetor controlled by float.

3. *OBSTRUCTION OF NEEDLE VALVE IN CARBURETOR*, causing stopping of engine or its refusal to start, is remedied by taking off the carburetor as above and unscrewing the needle of the needle valve and then blowing through the valve. Such obstruction is generally caused by there being some particles of dirt in the gasoline. Sometimes if the car slows down from this cause, releasing the clutch and opening the throttle, allowing the engine to race for a moment, will draw this dirt out of the needle valve.

4. *WATER IN GASOLINE*. In cold weather it will freeze in carburetor, preventing operation of the same. The most annoying symptom of this trouble, and which can be caused by an almost imperceptible amount of water, is popping in the carburetor and the cutting down of the power of the engine very perceptibly, and acts in every way as if the needle valve of the carburetor were set for too little gasoline. When there is considerable water in the gasoline it will stop the engine entirely. This can be remedied at the moment by opening the cock at bottom of carburetor and as the water is heavier it will drain out first. The cock directly under gasoline tank should also be opened for a few seconds. The only complete remedy, however, is a new supply of gasoline which should be drained through a chamois skin.

5. *LACK OF WATER CIRULATION*. This will cause the engine to heat very materially, lose its

power and begin to knock. It can be seen by looking in the opening in the top of radiator and noting whether the water is flowing from the engine. If not, either the hose or pipe connections are stopped up, which can easily be ascertained by disconnecting them, or else the pump is not working properly. The removal of the two bolts in pump, allowing its being taken off, will show where the trouble lies.

6. *VIBRATOR NOT SET PROPERLY OR PITTED.* This will cause the engine to miss and can be remedied by giving the thumb screw about one-fourth of a turn. If that will not do and the platinum points are pitted, file them off slightly. The lighter the tension on the vibrator spring the higher the musical note and the less current consumed. It must not, however, be too light.

7. *SOOTY SPARK PLUGS.* When the plugs have become fouled, due to excessive oil or long use, they should be removed and cleaned in gasoline. It should also be noted that the points are the correct distance apart (about one thirty-second inch for battery and about one-fortieth inch for magneto system).

8. *LOOSE OR BROKEN OR WEAK SPRING IN DISTRIBUTOR PLUNGER.* These troubles will cause a cylinder either to miss occasionally or not spark at all. The plunger spring can easily be fixed by removing and stretching it out, or else replacing it by a new spring.

Location of a broken wire can best be determined by using another piece of loose wire and by means of this piece bridging the different parts of the broken circuit from one connection to another until the defect is found, when the wire can be spliced or a new one put in.

9. *TIGHT BRAKES.* Refusal of the car to run easily or to climb hills may be due to the brakes binding. The tension rods may easily be adjusted to prevent this. A slight amount of oil should be put on internal brakes.

10. *LOSS OF COMPRESSION,* which very materially reduces the power of the engine, can readily be ascertained by turning the engine over by means of the crank, and trying each cylinder separately with the relief cocks on the others opened. This loss will in all probability be due to the valves not seating properly, due to their being covered with soot. This can be remedied by removing the valve caps and washing the valve seats and stems with kerosene; or, if they still refuse to seat, they should be ground with emery, turning the valve with a large screw driver or brace placed in slot in its top. The ports of the engine during this operation must be closed with waste to prevent the emery getting into the cylinders. A loose valve cap or spark plug will often cause loss of compression.

11. *BACK FIRING.* When an engine back fires into the carburetor, either it is not getting sufficient gasoline, due to the needle valve not being properly set or being obstructed, or else to an admission

valve sticking. The sticking of admission valve will be found due either to its having become sticky with soot (which is readily cleaned with kerosene), to a bent stem, or else to a weak spring. The spring can easily be removed by taking out the cross pin which holds it and withdrawing the valve. Back firing may be due to water in gasoline.

12. *CYLINDERS HEATING, PRE-IGNITION AND LOSS OF POWER.* This is due generally to too much gasoline being used. Turn off the gasoline slightly by means of the needle valve in carburetor. This may be due to carbon in cylinders.

13. *EXPLOSIONS IN MUFFLER.* This is due to one or more of the cylinders missing, allowing the unexploded gasoline vapor to collect in the muffler and can be traced either to the carburetor being set so as to give too much gasoline or else to trouble with the sparking. Quite often it is due to a weak battery.

14. *ADJUSTING BEARINGS.* When adjusting the Timken roller bearings, be careful not to run the nuts up so tight as to pinch them, as they must have some slight motion, that is, lengthwise on the shafts. Screwing up the adjusting nut too tight puts an excessive and unnecessary strain on these bearings.

List of Parts for 1911 Model 40

Please give both number and name of part when ordering, also number of car found on name plate on rear of frame. When ordering parts of engine give number of engine found on name plate on right side of engine, also car number. State if car is Roadster type.

FRONT WHEELS.

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|---|-----------------------------------|
| 6001 Front wheels with rims, without tires and bearings.
Specify rims and size of tires. | 6006 Nuts for spindle of knuckle. |
| 6002 Outside hubs for front wheels. | 6007 Felt dust washers. |
| 6003 Inside Timken front wheel bearings (Mfg.'s No. 337). | 6008 Front dust cap. |
| 6004 Outside Timken front wheel bearings (Mfg.'s No. 315). | 6009 Steel lock washer. |
| 6005 Bolts for holding spokes to hubs. | 6010 Flange for front wheel hubs. |
| | 6011 Steel spacing washer. |

REAR WHEELS.

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| 6013 Rear wheels with rims, without tires and bearings.
Specify rims and size of wheels and tires. | 6019 Lock washers for rear wheels. |
| 6014 Outside Timken rear wheel bearings (Mfg.'s No. 358). | 6020 Dog clutch. |
| 6015 Inside Timken rear wheel bearings (Mfg.'s No. 396). | 6021 Rear dust caps. |
| 6016 Felt dust washer. | 6022 Inside hubs for rear wheels. |
| 6017 Locking cap screw for rear hub dust caps. | 6023 Outside flanges for rear hubs. |
| 6018 Lock nuts for rear wheels. | 6024 Brake drums. |
| | 6025 Bolts for holding spokes to drums. |

SPRINGS AND CONNECTIONS.

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| 6027 Front springs, seven-passenger and Limousine bodies,
39½x2, 7 leaves. | 6037 Bracket for front end rear side springs. |
| 6028 Regular front springs, 39½x2, 6 leaves. | 6038 Rear spring links. |
| 6029 Front spring clips. | 6039 Short spring bolts with nuts. |
| 6030 Bracket for rear end front spring. | 6040 Long spring bolts with nuts. |
| 6031 Oiler for front spring bracket. | 6041 Ball oilers for front springs. |
| 6032 Links for front springs. | 6042 Ball oilers for rear springs. |
| 6033 Rebound clips complete. (Front springs.) | 6043 Clips with nuts for rear side springs. |
| 6034 Rear ¾ elliptic side spring (8 leaves), 47½x2. | 6044 Rebound clips complete (rear side spring). |
| 6035 Rear ¾ elliptic side springs for seven-passenger and
Limousine bodies, 47½x2 inches, 9 leaves. | 6045 Sheet steel holders for spring clips. Specify whether
front, rear lower or rear upper. |
| 6036 Rear side spring bracket. | 6046 Spring seat leather. Specify whether front, rear
lower or rear upper. |

FRONT SYSTEM.

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| 6048 Front axle complete with steering knuckles and
cross conn. rod. | 6058 Grease cups for steering knuckles and cross conn. rod. |
| 6049 I-Beam front axle forging only. (Machined.) | 6059 Cross conn. rod complete with adjusting end. |
| 6050 Right steering knuckle complete with arm. | 6060 Adjusting end for connecting rod. |
| 6051 Right steering knuckle arm with nut. | 6061 Bolt and nut for adjusting end. |
| 6052 Ball for right steering knuckle arm. | 6062 Ball rod complete. |
| 6053 Left steering knuckle complete with arm. | 6063 Ball rod end. (Knuckle end.) |
| 6054 Left steering knuckle arm with nut. | 6064 Ball rod end. (Steering chuck end.) |
| 6055 Lower steering knuckle bushing. | 6065 Adjusting screw in ball rod end. |
| 6056 Upper bushing for steering king bolt, in axle yoke
and knuckle. | 6066 Spring in ball rod end. |
| 6057 Lower bushing for steering king bolt, in knuckle. | 6067 King bolt through steering knuckle. |
| | 6068 Bushings in steering arms. |

REAR SYSTEM.

- 6070 Inner axles.
- 6071 Rear outside axle housing, only including front bearing for drive shaft, drive shaft tube, drive shaft lower bracket, brake supports, rear spring supports, cover for gear case, differential bearing caps and truss rod.
- 6072 Truss rods with nuts.
- 6073 Rear spring supports on axle.

- 6074 Spacing collars with bolts for spring supports.
- 6075 Bearings caps inside of gear case.
- 6076 Studs for holding bearing caps.
- 6077 Nuts for holding bearing caps.
- 6078 Cover for gear case.
- 6079 Screws and lock washers for cover for gear case.
- 6080 Grease cup in side of brake support.
- 6081 Grease cup in brake shoe supporting pin.

DIFFERENTIAL AND DRIVING GEARS.

- 6082 Differential complete without driving gears.
- 6083 Differential case without internal gears and pinions.
- 6084 Differential case half for driving gear.
- 6085 Differential case half opposite driving gear.
- 6086 Special cap screws and nuts for differential case.
- 6087 Bevel gears inside of differential.
- 6088 Bevel pinions inside of differential.
- 6089 Spider for bevel pinions in differential.
- 6090 Timken bearings on differential. (Mfg.'s No. 385.)
- 6091 Adjusting nuts for differential bearings.
- 6092 Lock washers for differential bearings.
- 6093 Hinged spacing collar between bearing and adjusting nut.
- 6094 Solid spacer against Timken bearing.

- 6095 Large bevel gear. (Give car number, also number of teeth, both gear and pinion.)
 - 13-45 Gear.
 - 14-45 Gear.
 - 15-45 Gear.
 - 16-45 Gear.
 - 17-45 Gear.
 - 18-45 Gear.
- 6096 Bevel drive pinion. (Give car number, also number of teeth on both pinion and gear.)
 - 13-45 Pinion.
 - 14-45 Pinion.
 - 15-45 Pinion.
 - 16-45 Pinion.
 - 17-45 Pinion.
 - 18-45 Pinion.

DRIVE SHAFT.

- 6099 Drive shaft tube complete with front bearing for drive shaft, locking collar and lower bracket.
- 6100 Drive shaft tube with locking collar.
- 6101 Drive shaft tube lower bracket.
- 6102 Drive shaft with cross pin and nut for pinion.
- 6103 Drive shaft pinion nut.
- 6104 Drive shaft cross pin.
- 6105 Timken bearings on drive shaft back of pinion. (Mfg.'s No. 441.)
- 6106 Timken bearings front end of drive shaft. (Mfg.'s No. 339.)
- 6107 Drive shaft thrust washer.

- 6108 Adjusting nuts for drive shaft.
- 6109 Lock washer for adjusting nuts on drive shaft.
- 6110 Swivel hub front bearing support without bearing.
- 6111 Metal dust washer over bearing.
- 6112 Locking key for drive shaft tube.
- 6113 Swivel yoke.
- 6114 Swivel yoke bracket.
- 6115 Steel bolt through swivel yoke bracket.
- 6116 Special cap screw holding swivel yoke to top drive shaft bearing support.
- 6117 Spacer behind Timken bearing on drive shaft.
- 6118 Grease cup in swivel hub bearing support.

BRAKE RODS.

- 6120 Tension rods with turnbuckle for hand brake.
- 6121 Tension rods with turnbuckle for foot brake.
- 6122 Turnbuckle for tension rods.
- 6123 Long end tension rods. (Hand brake.) R. H. thread.
- 6124 Long end tension rods. (Foot brake.) R. H. thread.
- 6125 Short end tension rods. (Hand or foot brake.) L. H. thread.
- 6126 Left outside brake tubing with levers.
- 6127 Right outside brake tubing with levers.
- 6128 Inside shaft with levers.
- 6129 Brake shaft bracket.
- 6130 Equalizing link complete, including rods, cross bar and clevis pins.
- 6131 Cross bar for equalizing link.

- 6132 Equalizing link rods.
- 6133 Equalizing levers on outside shaft for foot brakes.
- 6134 Clevis pins, $\frac{3}{8}$ in. diameter.
- 6135 Spiral springs for equalizing levers.
- 6136 Chain for equalizing levers.
- 6137 Side tension rods with turnbuckle. (Foot brake.)
- 6138 Side tension rods with turnbuckle. (Hand brake.)
- 6139 Turnbuckle for side tension rods.
- 6140 Long end side tension rod. (Hand brake.) R. H. thread.
- 6141 Long end side tension rod. (Foot brake.) R. H. thread.
- 6142 Short end side tension rod. (Hand or foot brake.) L. H. thread.

BRAKES.

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| <p>6145 Internal brake bands. (Two pieces for one wheel.)
 6146 Spring for internal brake band.
 6147 Cam shaft for internal brake band.
 6148 Supporting pin for internal brake band.
 6149 External brake band complete.
 6150 Lining for external brake band.
 6151 Supporting springs for external brake bands.</p> | <p>6152 Bracket for supporting springs.
 6153 Adjuster for external brake bands.
 6154 Pins for ends external brake bands.
 6155 External brake shaft with bell crank brazed on.
 6156 Grease cup for brake shaft.
 6157 Levers for internal and external brake shaft.</p> |
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HAND LEVERS AND CONTROL.

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| <p>6158 Clutch yoke.
 6159 Clutch lever adjuster on clutch shaft.
 6160 Clutch shaft bracket.
 6161 Clutch shaft complete.
 6162 Clutch adjusting screw with lock nut.
 6163 Brake lever shaft tubing with lever for outside control.
 6164 Brake lever shaft tubing with lever for inside control.
 6165 Controller lever shaft for outside control.
 6166 Controller lever shaft for inside control.
 6167 Short gear shifting lever.
 6168 Ratchet bracket for controller and brake hand levers for outside control.
 6169 Ratchet bracket for controller and brake hand levers for inside control.
 6170 Hexagon nut for controller shaft.
 6171 Collar for controller shaft.
 6172 Brake foot pedal with flat spring.
 6173 Clutch foot pedal with flat spring.
 6174 Brake hand lever complete for outside control.</p> | <p>6175 Brake hand lever complete for inside control.
 6176 Brake hand lever slide.
 6177 Brake hand lever grip.
 6178 Controller hand lever complete for outside control.
 6179 Controller hand lever complete for inside control.
 6180 Controller hand lever catch.
 6181 Controller hand lever finger grip.
 6182 Tension rods and ends for brake and controller hand levers for outside control.
 6183 Tension rods and ends for brake and controller hand levers for inside control.
 6184 Springs for brake and controller hand lever tension rods.
 6185 Special screws in brake and controller hand lever slide and catch.
 6186 Clutch lever.
 6187 Foot brake lever.
 6188 Foot brake lever adjuster.
 6189 Clutch and brake lever pedal plungers, brass plated. (State length.)</p> |
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CLUTCH AND CLUTCH COUPLING.

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| <p>6190 Cone clutch complete with clutch hub, bushing, slide, bumper pulley and thrust bearing.
 6191 Clutch spider with leather and springs under leather.
 6192 Clutch leather.
 6193 Springs under clutch leather.
 6194 Clutch hub.
 6195 Clutch hub sleeve.
 6196 Bushing in clutch hub.
 6197 Ball thrust bearing complete with washers on clutch hub.
 6198 Hardened washers for thrust bearing on clutch hub.
 6199 Clutch slide.
 6200 Clutch coupling universal joint ends.
 6201 Clutch coupling sliding squares.
 6202 Clutch coupling shaft. (Dumbbell shape.)</p> | <p>6203 Large spiral spring in clutch hub. (Clutch spring.)
 6204 Washer for clutch spring.
 6205 Clutch stud.
 6206 Taper pin and nut for clutch stud.
 6207 Ball thrust bearing complete with washers for clutch stud. (Laird.)
 6208 Hardened washers for clutch stud thrust bearing.
 6209 Clutch bumper pulley on clutch hub.
 6210 Clutch coupling transmission end.
 6211 Clutch brake complete.
 6212 Clutch brake adjuster with lock nut.
 6213 Clutch brake spring.
 6214 Clutch brake shoe with guide stem.
 6215 Thermoid lining for clutch brake shoe.</p> |
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STEERING AND STEERING CLUTCH.

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| <p>6216 Steering post complete, with chuck, throttle pedal, bracket, hand wheel and connections.
 6218 Steering post. Specify if roadster.
 6219 Bracket for throttle pedal. Specify body.
 6220 Steering wheel 18 in. diameter.</p> | <p>6221 Hexagon nut holding steering wheel on stem.
 6222 Steering post jacket tube.
 6223 Sector on wheel with tubing through stem.
 6224 Spark lever on hand wheel.
 6225 Tubing through post for spark lever.</p> |
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STEERING AND STEERING CLUTCH (Continued)

6226	Throttle lever on hand wheel.	6239	Thrust collar.
6227	Rod through post for throttle lever	6240	Ball thrust bearing.
6228	Auxiliary air lever.	6241	Adjusting nut.
6229	Cable for auxiliary air.	6242	Timing bevels. (Advise which required.)
6230	Steering chuck complete.	6243	Timing levers. (Advise which required.)
6231	Case for steering chuck.	6244	Clamp at bottom of chuck.
6232	Worm with shaft.	6245	Oilers.
6234	Gear with shaft.	6246	Grease cups.
6235	Gear shaft bushings.	6247	Vertical throttle rod, gear at bottom, lever at top.
6236	Upper and lower bushing for worm.	6248	Vertical spark tubing, gear at bottom, lever at top.
6237	Steering arm with bolt and nut.	6249	Cover for timing bevels.
6238	Steering arm bolt and nut.		

SPARK AND THROTTLE CONTROL DETAIL.

6250	Throttle foot plunger.	6260	Spark control shaft only.
6251	Throttle foot pedal button.	6261	Bearings or brackets for spark control shaft.
6252	Spiral spring for throttle foot pedal.	6262	Levers on spark control shaft. (State how long.)
6253	Rod complete from throttle pedal to carburetor.	6263	Lever on steering chuck for spark control.
6254	Rod from carburetor to vertical post lever.	6264	Ball rod complete, chuck to spark control shaft.
6255	Rod from throttle pedal to carburetor only.	6265	Distributor ball rod complete.
6256	Stop with set screw on throttle rod.	6266	Magneto ball rod complete.
6257	Lever on steering chuck.	6267	Ball rod ends for spark control rod.
6258	Horizontal shaft with bearing and two levers for control of magneto.		

TRANSMISSION.

6268	Universal joint.	6296	Inspection plate.
6269	Transmission complete with universal joint, coupling end, rear hanger and all gears.	6297	Thumb screws for inspection plate.
6270	Transmission case complete with cap for reverse bearing and cover and inspection plate.	6298	17-tooth sliding pinion.
6271	Transmission case cover complete.	6299	25-tooth sliding pinion and clutch.
6272	Screws for cover.	6300	20-tooth reverse pinion.
6273	Counter shaft adjuster.	6301	14-tooth sliding pinion. (Reverse.)
6274	Long bearing end adjuster, rear.	6302	Reverse bearing for rear end of reverse shaft.
6275	Main bearing adjuster, front.	6303	Plug bearing for front end of reverse shaft.
6276	Hanger for rear of transmission case.	6304	Pinion shifter rod No. 1. (First speed and reverse.)
6277	9-16 in. ball for locking shifter rods.	6305	Pinion shifter rod No. 2.
6278	Vertical bolts for transmission hanger.	6306	Counter shaft only.
6279	Horizontal bolts for transmission arm.	6307	Counter shaft complete with gears.
6280	No. 307 bearings for counter shaft.	6308	Main shaft only.
6281	No. 308 bearing for main shaft.	6309	Reverse shaft only.
6282	No. 211 bearing for stationary tooth clutch.	6310	Reverse shaft with pinions.
6283	No. 311 bearing for universal joint.	6311	Reverse shaft spring.
6284	Stationary tooth clutch.	6312	Felt washer long bearing end.
6285	Stationary tooth clutch bushing.	6313	Pinion shifter yoke No. 1, with plunger lock complete. (1st speed and rev.)
6286	Collar for counter shaft 3-16 in. long.	6314	Pinion shifter yoke No. 2, with plunger lock complete.
6287	Collar for counter shaft 7-16 in. long.	6315	Plugs in bottom and end of case.
6288	Collar for counter shaft 1 in. long.	6316	Equalizing spring for short gear shifting lever.
6289	Collar for counter shaft 1 3-16 in. long.	6317	Felt washer back of front main bearing adjuster.
6290	Main shaft distance collar.	6318	Felt washer in front main bearing adjuster.
6291	Gear on counter shaft, 31-tooth.	6319	Universal joint squares back of transmission.
6292	Gear on counter shaft 23-tooth.	6320	Steel washer in front of No. 308 bearing on main shaft.
6293	Gear on counter shaft 17-tooth.	6321	Steel washer in rear of No. 308 bearing on main shaft.
6294	Gear on stationary tooth clutch.	6322	Flat locking key for countershaft adjuster.
6295	Guard for sliding reverse pinion.	6323	Spring for plunger lock for shifter rods.

GASOLINE SYSTEM.

- Specify if for regular car or roadster.
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|------|--|------|---|
| 6324 | Gasoline tank. | 6337 | Coil to pressure regulator complete for roadster. |
| 6325 | Gasoline tank cap. | 6338 | Branch pipe complete, connecting pressure regulator gauge and hand pump for roadster. |
| 6326 | Gasoline tank strainer. | 6339 | Pressure pipe complete. Branch pipe to tank for roadster. |
| 6327 | Bottom connection in gasoline tank complete. | 6340 | Bands for gasoline tank for roadster. |
| 6328 | Gasoline tank supports. | 6341 | Bands for oil tank for roadster. |
| 6329 | Gasoline tank straps. | 6342 | Hand pump with cut-off cock for roadster. |
| 6330 | Cut-off rod to gasoline tank. | 6343 | Pet cocks in tanks for roadster. |
| 6331 | Gasoline pipe to carburetor. Complete. | 6344 | Cut-off cock in tanks for roadster. |
| 6332 | Hot air pipe to carburetor. Complete. | 6345 | Oil tank complete for roadster. |
| 6333 | Exhaust hot air pipe from carburetor. | 6346 | Gasoline tank complete for roadster. |
| 6334 | Gasoline pressure gauge for roadster. | 6347 | Supports for oil tank for roadster. |
| 6335 | Pressure regulator for roadster. | 6348 | Supports for gasoline tank for roadster. |
| 6336 | Pet cock in pressure regulator for roadster. | | |

MUFFLER AND CONNECTIONS.

- | | | | |
|------|-----------------------------------|------|--|
| 6350 | Muffler complete. | 6359 | Muffler support at center. |
| 6351 | Front head complete with cut out. | 6360 | Muffler support at end. |
| 6352 | Cut out lever on muffler. | 6361 | Muffler cut out bracket on foot board. |
| 6353 | Cut out spring on muffler. | 6362 | Muffler cut out bell crank. |
| 6354 | Cut out muffler without head. | 6363 | Muffler cut out escutcheon plate, lower. |
| 6355 | Cut out rod and nut on muffler. | 6364 | Muffler cut out escutcheon plate, upper. |
| 6356 | Cut out valve on muffler. | 6365 | Muffler cut out pulley and guard. |
| 6357 | Rear head. | 6366 | Muffler cut out plunger. |
| 6358 | Rods binding heads and sections. | 6368 | Muffler cable. |

FRAME AND DASH.

- | | | | |
|------|--|------|--|
| 6370 | Pressed steel frame with parts riveted on, including fender and spring brackets. Rear spring brackets $\frac{3}{4}$ elliptic. Rear spring bracket for front end of spring. | 6373 | Dash brackets. Specify regular or roadster. |
| 6371 | Fender brackets. | 6374 | Hood rest on dash, state whether pressed steel or cast aluminum. |
| 6372 | Mahogany dash with brass moulding, state style of body. | 6375 | Wood dash, specify what type of body. |
| | | 6376 | Brass moulding for dash. State style of body. |

HOOD AND RADIATOR.

- | | | | |
|------|----------------------------------|------|--|
| 6378 | Hood | 6387 | Bottom hose from radiator to pump. |
| 6379 | Hood fasteners. | 6388 | Hose clamps. (State where used.) |
| 6380 | Hood boards. Right and left. | 6389 | Hose nipples. |
| 6381 | Studs for hood boards. | 6390 | Strainer in top of radiator. |
| 6382 | Cap nuts for hood boards. | 6391 | Radiator filler cap. |
| 6383 | Escutcheon plates for fasteners. | 6392 | Nut on radiator supporting rod. |
| 6384 | Radiator. | 6393 | Drain cock in bottom of radiator. |
| 6385 | Rod from radiator to dash. | 6394 | Street elbows, state whether plain or tapped for pet cock. |
| 6386 | Top hose for radiator. | | |

FENDERS AND DUST SHIELD.

- | | | | |
|---|-------------------------------------|------|---------------------------------------|
| Specify if for touring car or roadster. | | 6398 | Left hand rear fender with irons. |
| 6395 | Right hand front fender with irons. | 6399 | Right hand running board dust shield. |
| 6396 | Left hand front fender with irons. | 6400 | Left hand running board dust shield. |
| 6397 | Right hand rear fender with irons. | | |

ENGINE DUST PANS.

- | | |
|---|--|
| 6401 Complete set dust pans. | 6403 Dust pan on right side of engine. |
| 6402 Dust pan under fly wheel and clutch. | 6404 Dust pan on left side of engine. |

RUNNING BOARDS AND STEPS.

- | | |
|---|---|
| Specify if regular car or roadster. | 6408 Pressed steel supporting irons for running boards. |
| 6406 Right hand running board complete with mat and brass edge strip. (Linoleum.) | 6409 Brass edge strip around running boards. |
| 6407 Left hand running board complete with mat and brass edge strip. (Linoleum.) | 6410 Linoleum for running board, if used. |
| | 6411 Rubber matting for running boards, if used. |

BATTERY AND TOOL BOXES AND TOOLS.

- | | |
|--|--------------------------------------|
| 6414 Battery box. | 6426 Tire pump. |
| 6415 Tool box. Specify for touring or roadster. | 6427 Tire repair kit. |
| 6416 Keys for battery and tool box locks. | 6428 Coil plug. |
| 6417 Bicycle wrench. | 6429 Jack. |
| 6418 Combination water pump and rear wheel nut wrench. | 6430 Magneto wrench. |
| 6419 Combination socket wrench for clutch stud, valve caps, spark plugs, and front wheel nuts. | 6431 Gas tank wrench. |
| 6420 Open end wrench for differential nuts. | 6432 Hammer. |
| 6421 Small open end wrench for carburetor connections and gear cover for crank case. | 6433 Chisel. |
| 6422 Large screw driver. | 6434 Auto jack and handle. |
| 6423 Small screw driver. | 6435 Dust cap wrench. |
| 6424 8-in. x 1/2-in. steel bar for socket wrench. | 6436 Priming can for motor. |
| 6425 Pair pliers. | 6437 Oil can. |
| | 6438 Priming can holder and bracket. |

LAMPS, HORNS ETC.

- | | |
|--|------------------------------|
| 6440 Tail lamp bracket. | 6448 Tail lamp. |
| 6441 Right hand front lamp bracket. | 6449 Prest-O-Lite gas tank. |
| 6442 Left hand front lamp bracket. | 6450 Horn complete. |
| 6443 Right hand side lamp bracket (Brass plated.) State style of body. | 6451 Bulb for horn. |
| 6444 Left hand side lamp bracket. (Brass plated.) State style of body. | 6452 Flexible tube for horn. |
| 6445 Horn bracket. (Brass plated.) | 6453 Reed for horn. |
| 6446 Side oil lamps. (Right and left.) | 6454 Screen for horn |
| 6447 Front gas lamps. | 6455 Robe rail. |
| | 6456 Foot rail. |

BODY PARTS.

- | | |
|---|--|
| 6459 Body complete, painted and upholstered with cushions, coat and foot rails. | 6466 Tonneau carpet. |
| 6460 Tonneau door hinges. Upper and lower. Right and left | 6467 Top bank board, bound and covered with linoleum. |
| 6461 Tonneau door locks. Right and left. | 6468 Middle bank board bound and covered with linoleum. Give width and length. |
| 6462 Tonneau door handles. Right and left. | 6469 Bottom bank board bound and covered with linoleum. Give width and length. |
| 6463 Cushions for front seats. | 6470 Floor board bound and covered with linoleum. Give width and length. |
| 6464 Tonneau cushions. | |
| 6465 Front mat. | |

TOP IRONS.

- | | |
|---|---|
| Specify type of body | 6474 Top irons on tonneau rear, right and left. |
| 6473 Top irons on tonneau seat, right and left. | 6475 Top irons on front seat, right and left. |

Engine

CRANK CASE.

Give number of engine shown on plate on right side.

- | | | | |
|------|--|------|--|
| 6478 | Crank case complete, including caps for crank and cam shaft bearings, gear cover, oil filler and crank case pan. | 6495 | Main bearing gear end. |
| 6479 | Upper half of crank case, studded without gear cover and oil filler. | 6496 | Aluminum main bearing caps. |
| 6480 | Bottom half of crank case complete with gear, oil pump, and oil level float and stem. | 6497 | Nuts for crank shaft bearing cap. |
| 6481 | Crank case pan. Pressed steel. | 6498 | Horizontal $\frac{1}{2}$ -in. arm bolt. Rear. |
| 6482 | Bearing for oil pump shaft. | 6499 | Crank case arm brackets. (For frame.) |
| 6483 | Long 9-16-in. studs for crank shaft bearing cap. | 6500 | Ball bearings on pump and magneto shaft. (Mfg's No. 305.) |
| 6484 | Medium 9-16-in. studs for crank shaft bearing cap. | 6501 | Steel thrust washer at front of crank case. |
| 6485 | Short 9-16-in. studs for crank shaft bearing cap. | 6502 | Fibre thrust washer at front of crank case. |
| 6486 | Short main bearing, fly wheel end. | 6503 | Thumb nuts for inspection plate. |
| 6487 | Bushing for No. 305 bearing. | 6504 | Steel magneto and pump gear. |
| 6488 | Front crank case arm. | 6505 | Front end bearing sleeve. |
| 6489 | Rear crank case tubing arm. | 6506 | Front end bearing nut. |
| 6490 | Long 7-16-in. arm bolt. Front. | 6507 | Crank case oil filler. |
| 6491 | Vertical $\frac{5}{8}$ -in. arm bolts. Rear. | 6508 | Studs for crank case oil filler. |
| 6492 | Horizontal 7-16-in. arm bolt. Front. | 6509 | Oil filler complete. |
| 6493 | Front gear cover cam shaft gears. | 6510 | Fan Bracket. |
| 6494 | Main bearing fly wheel end and center. | 6511 | Cork float with stem, wire and ball. |
| | | 6512 | Float guide stem with pipe plug. |
| | | 6513 | Float tubing with solid plug in top and threaded plug in bottom. |

CYLINDERS.

- | | | | |
|------|--|------|---|
| 6515 | Pair cylinders complete with valves, cocks, caps, etc. (State which pair is wanted. No. 1 and No. 2 cylinders are next to dash.) | 6521 | Drain cocks. $\frac{1}{4}$ -in. |
| 6516 | Pair cylinders bare with valve stem guides. | 6522 | Cylinder plates for top of cylinder. |
| 6517 | Studs for holding cylinders to crank case. | 6523 | Pair cylinders plain with valve stem guides for roadster. |
| 6518 | Nuts for studs for holding down cylinders. | 6524 | Pair cylinders complete with valves, cocks, caps, etc., for roadster. (State which pair is wanted. No. 1 and No. 2 cylinders are next to dash.) |
| 6519 | Solid water jacket plug. | | |
| 6520 | Priming cocks. $\frac{1}{4}$ -in. | | |

PISTONS.

- | | | | |
|------|---------------------------------------|------|-------------------------------|
| 6527 | Pistons complete with rings and pins. | 6531 | Piston pin set screw. |
| 6528 | Pistons plain. | 6532 | Nut for piston set screw. |
| 6529 | Piston rings. | 6533 | Piston complete for roadster. |
| 6530 | Piston pin. | 6534 | Piston plain for roadster. |

CRANK SHAFT, CONNECTING RODS AND FLY WHEEL.

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|------|---|------|---|
| 6537 | Crank shaft plain. | 6546 | Fly wheel bolts with nuts and washers. |
| 6538 | Connecting rod complete with bearing, bushings and studs. | 6547 | Steel timing gear on crank shaft. |
| 6539 | Connecting rod forging, machined. | 6548 | Ratchet on crank shaft for starting crank. |
| 6540 | Connecting rod piston pin bushing. | 6549 | Taper pin through ratchet. |
| 6541 | Connecting rod bearing bushing, crank shaft end. | 6550 | Crank shaft nut for holding timing gear on crank shaft. |
| 6542 | Connecting rod studs. Lower end. | 6551 | Connecting rods for roadster. |
| 6543 | Connecting rod stud nuts. Lower end. | 6552 | Connecting rod stud for roadster. |
| 6544 | Liners for connecting rod bearings. | 6553 | Connecting rod stud nut for roadster. |
| 6545 | Fly wheel. | | |

CAM SHAFT AND GEARS.

6555	Bronze timing gear on admission cam shaft.	6564	Front bearing for cam shafts.
6556	Bronze timing gear on exhaust cam shaft.	6565	Center and rear bearings for cam shafts.
6557	Mitre gear on exhaust cam shaft for distributor and oil pump.	6566	Studs for front cam shaft bearings.
6558	Admission cam shaft complete with gear, cams and bearings.	6567	Nuts for front cam shaft bearings.
6559	Exhaust cam shaft complete with gears, cams and bearings.	6568	$\frac{3}{8}$ -in. pins for holding gear to cam shaft flange.
6560	Admission cam shaft, plain.	6569	Cam shaft nut for holding gear on shaft.
6561	Exhaust cam shaft, plain.	6570	Admission cam shaft, plain, for roadster.
6562	Cam shaft bearing caps. (Center or rear.)	6571	Admission cam shaft complete with gears and bearings for roadster.
6563	Cap screw for cam shaft bearing caps.	6572	Exhaust cam shaft, plain, for roadster.
		6573	Exhaust cam shaft complete with gear and bearings for roadster.

VALVE DETAIL.

6575	Valve stem guide.	6587	Valve spring washer.
6576	Valves.	6588	Valve spring washer keys.
6577	Valve caps with tapped hole for spark plug.	6589	Valve lifter complete with cage. (State if for roadster.)
6578	Valve caps, plain, if wanted	6590	Valve lifter with cap screw adjuster in top.
6579	Valve cap ring.	6591	Cap screw with lock nut for top of valve lifter.
6580	Valve lifter only.	6592	Lock washer for cap screw.
6581	Valve lifter roller.	6593	Valve lifter studs for holding valve lifter cage to crank case.
6582	Valve lifter roller pin.	6594	Valve lifter stud nuts.
6583	Valve lifter cage with cap.	6595	Valves for roadster.
6584	Valve lifter springs in cage.	6596	Valve lifter only for roadster.
6585	Valve spring admission side.		
6586	Valve spring exhaust side.		

DISTRIBUTOR AND PARTS.

6599	Distributor complete with shaft, brackets and gear at bottom of shaft.	6613	Ball sockets. (Primary and secondary ball contacts.)
6600	Distributor only.	6614	Binding post nuts.
6601	Distributor shaft, plain.	6615	3-16-in. balls.
6602	Brass tubing on outside of shaft.	6616	Thin hexagon nuts.
6603	Distributor control lever.	6617	$\frac{1}{4}$ -in. x 20 set screws.
6604	Bracket for distributor shaft attached to crank case.	6618	Thin knurled nuts.
6605	Bracket for distributor shaft attached to cylinder.	6619	5-16-in. balls.
6606	Mitre gear at bottom of distributor shaft.	6620	Stationary ball cone.
6607	Steel center.	6621	Outer ball cone.
6608	Brass case.	6622	Adjusting washer.
6609	Rubber case.	6623	Adjusting washer lock spring.
6610	Rubber cover	6624	Oil hole cover.
6611	Rubber post.	6625	Oil hole cover screw.
6612	Brass sweep.	6626	Distributor base.

WATER PUMP.

6629	Centrifugal water pump complete.	6632	Centrifugal water pump shaft.
6630	Centrifugal water pump case.	6633	Packing nuts on centrifugal pump.
6631	Centrifugal water pump rotor with shaft.	6634	Fan pulley on pump shaft.

EXHAUST, ADMISSION AND WATER PIPES.

6638	Exhaust pipe complete with tee and elbow.	6648	Auxiliary air valve cage.
6639	Exhaust pipe, plain.	6649	Auxiliary air valve head and stem.
6640	Tee connection for exhaust pipe.	6650	Auxiliary air valve lever.
6641	Elbow for exhaust pipe.	6651	Auxiliary air valve spring.
6642	Pipe yokes.	6652	Water pipe, outlet with tapered tee and elbow.
6643	Pipe yoke studs.	6653	Water pipe, inlet with tapered tee and elbow.
6644	Nuts for pipe yoke studs.	6654	Water pipe tees.
6645	Double tapered nipples for exhaust and admission pipes.	6655	Water pipe elbows.
6646	Admission pipe complete.	6656	Hose connections on water pipes, between cylinders, between water pipe and pump.
6647	Auxiliary air valve complete.	6657	Admission pipe complete for roadster.

MAGNETO CONNECTIONS.

6660	Magneto gear shaft.	6665	Coupling end attached to pump shaft.
6661	Magneto strap (2 pieces) complete.	6666	Coupling end attached to magneto.
6662	Magneto strap yoke nut.	6667	Dowel pins in plate under magneto.
6663	Magneto strap plate.	6668	Water pump coupling gear end.
6664	Coupling for driving magneto complete. (State if for roadster.)	6669	Water pump coupling pump end.
		6670	Water pump coupling center.

STARTING CRANK CONNECTIONS.

6673	Starting crank complete with bracket.	6678	Starting crank.
6674	Starting crank handle.	6679	Starting crank spring.
6675	Starting crank handle pin.	6680	Starting crank bracket.
6676	Starting crank ratchet.	6681	Grease cup in starting crank bracket.
6677	Starting crank collar.		

FAN PARTS.

6685	Fan complete with shaft nuts and bearings.	6690	Fan belt.
6686	Fan only.	6691	Fan bearings. (Mfg's No. 302.)
6687	Fan blade.	6692	Eccentric for fan shaft.
6688	Fan shaft.	6693	Fan belt fastener.
6689	Small pulley for fan.		

MAGNETO AND PARTS.

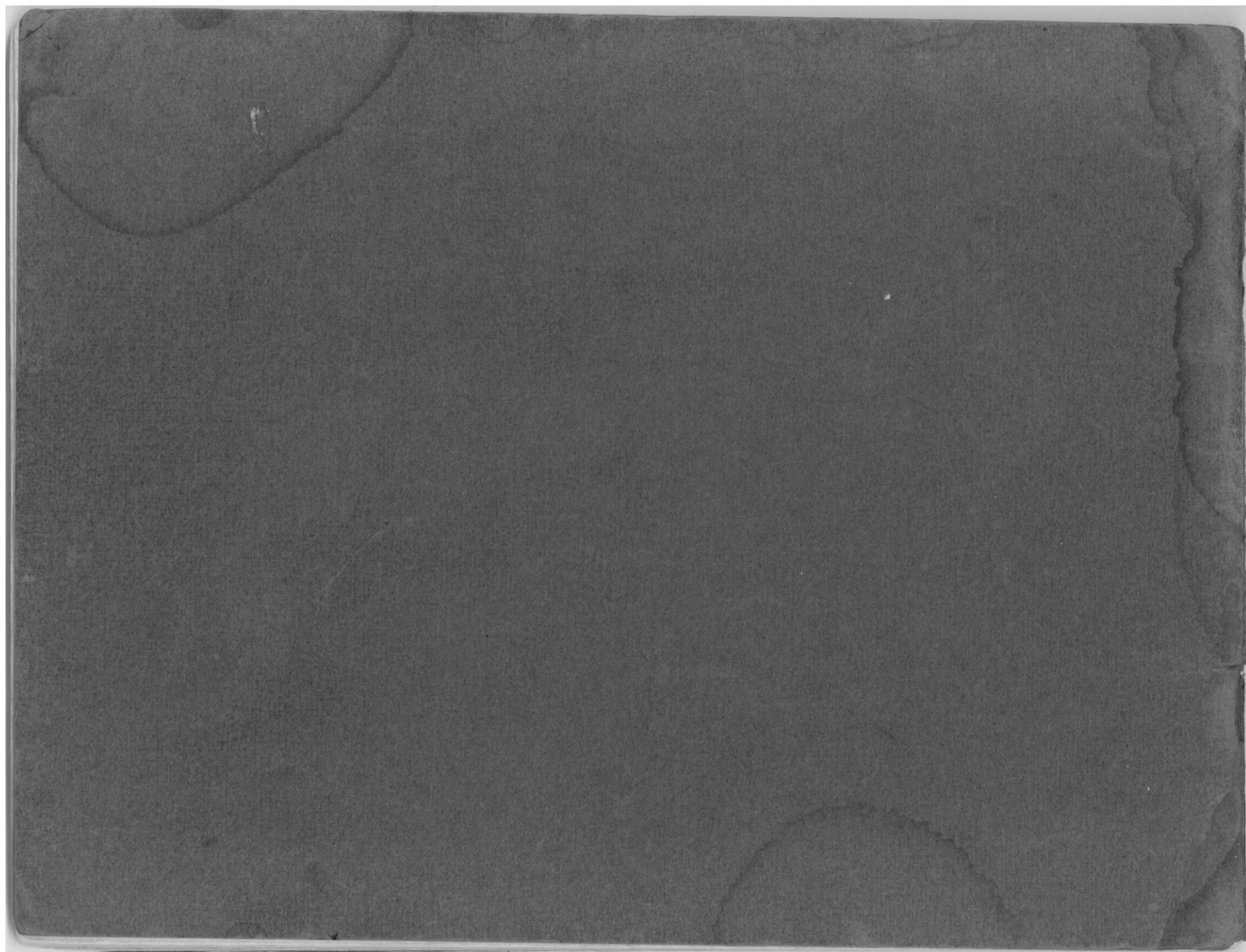
6694	Splitdorf magneto for roadster. (See Splitdorf list for parts.)	6708	Two-wire cleats.
6695	Bosch magneto. (For repair parts, see Bosch list.)	6709	½-in. fibre tubing cleats.
6696	Wiring bracket, exhaust side.	6710	Contact screw with platinum point for con.
6697	Wiring bracket, admission side.	6711	Bridge.
6698	Fibre block for wiring bracket.	6712	Bridge spring.
6699	Spark coil complete. Heinze or Splitdorf.	6713	Bridge nut.
6700	Plug for spark coil.	6714	Vibrator spring with platinum contact.
6701	Terminal for wires at spark plugs.	6715	Vibrator adjusting screw.
6702	Spark plugs.	6716	Secondary binding post.
6703	Terminals for distributor wires.	6717	Retaining screw for rocker base and bridge.
6704	Storage battery, 3-cell, 6-volt.	6718	Primary binding post nut.
6705	Rubber covered cable.	6719	Primary binding post washer.
6706	Bare flexible copper ground wire.	6720	Unit primary contact spring.
6707	Single wire cleats.	6721	Screw for above spring.

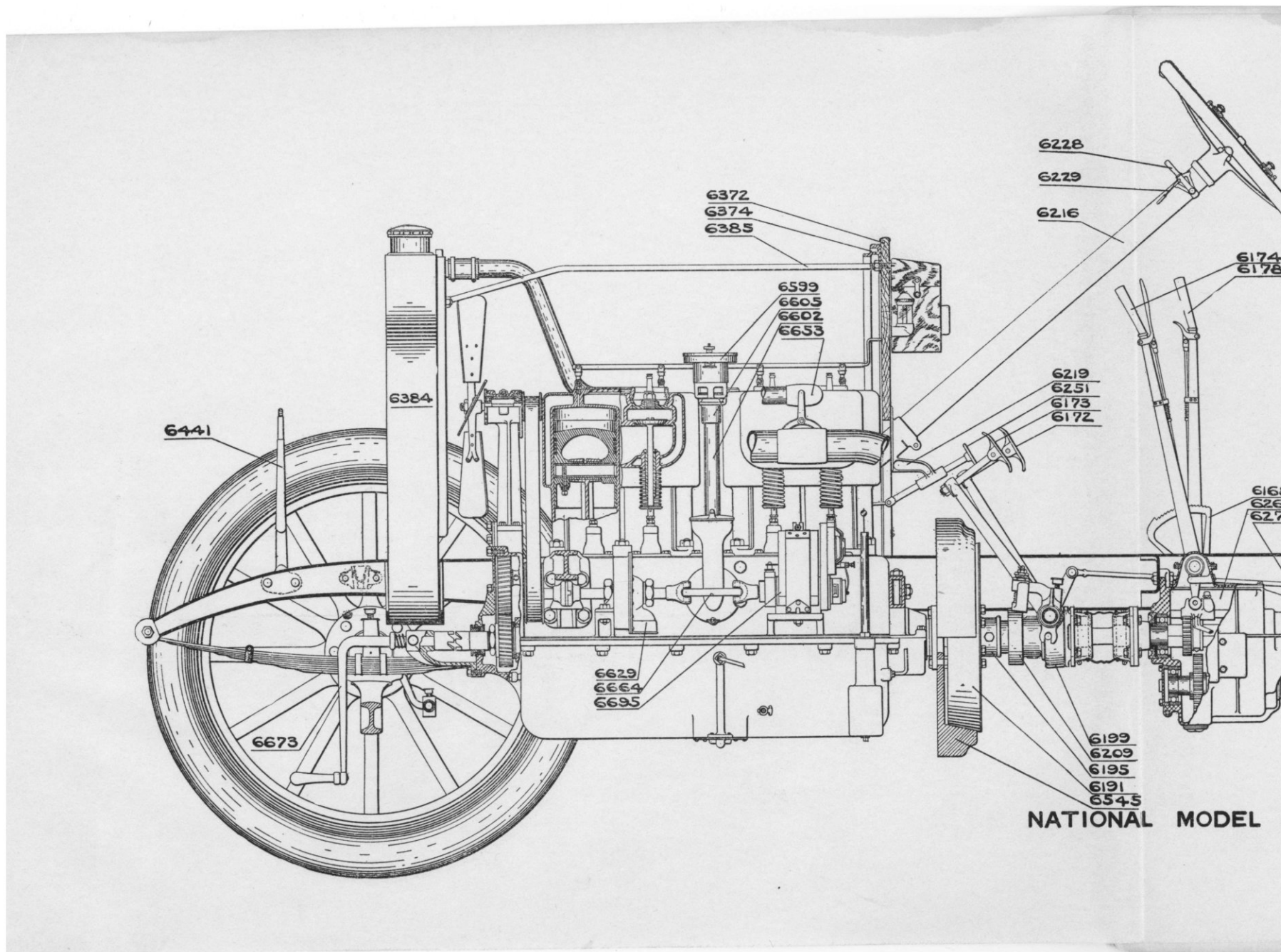
OIL AND PUMP PARTS.

6722	Oil pump complete.	6726	Oil pump countershaft and gear.
6723	Oil pump case.	6727	Oil pump driving shaft.
6724	Oil pump cover.	6728	Intermediate oil pump shaft complete with mitre gear.
6725	Oil pump main shaft and gear.		

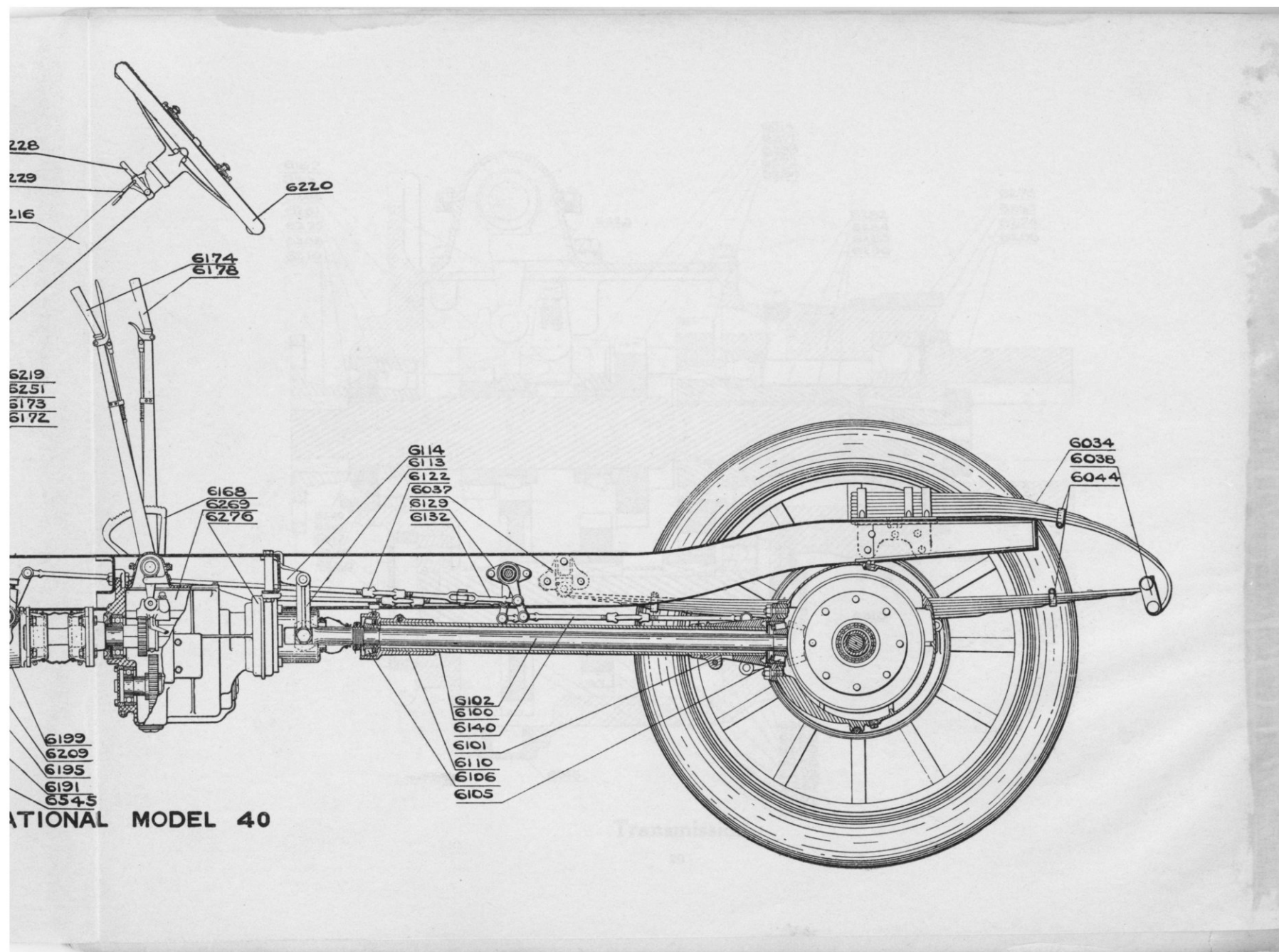




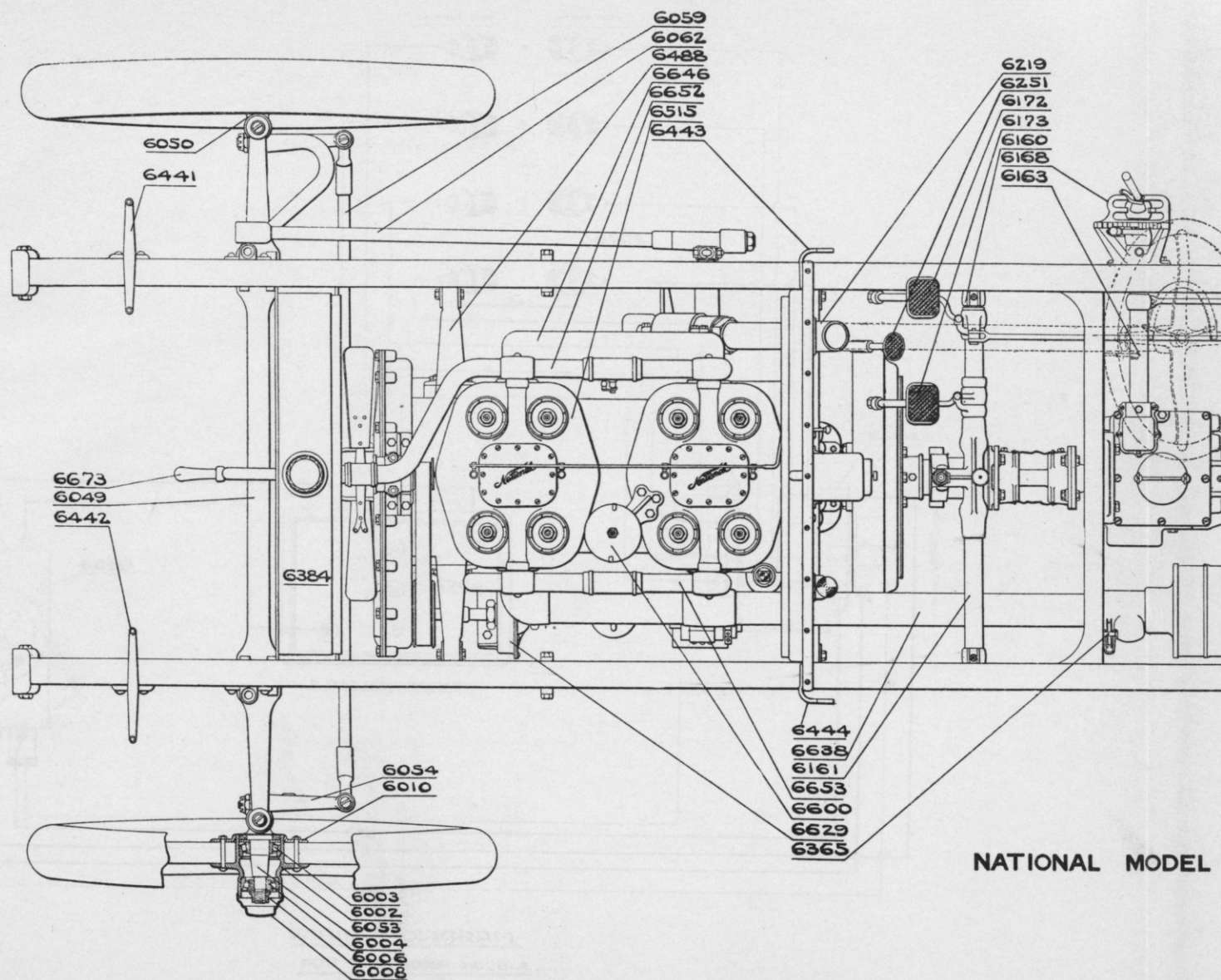




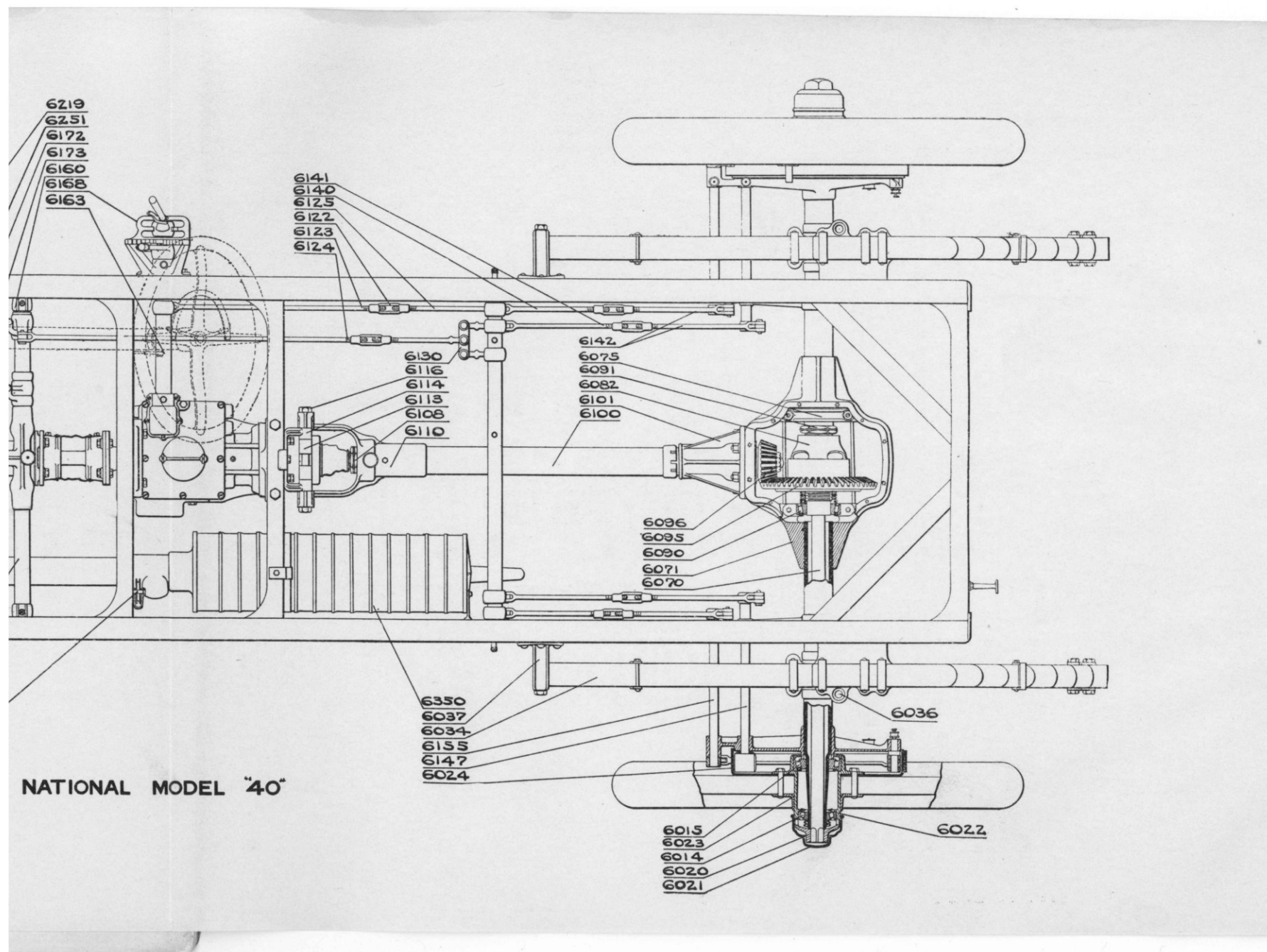
Modern viewing panel: original chassis A, left half; overlaps adjoining panel.



Modern viewing panel: original chassis A, right half; overlaps adjoining panel.



Modern viewing panel: original chassis B, left half; overlaps adjoining panel.



Modern viewing panel: original chassis B, right half; overlaps adjoining panel.