Ford Service Bulletin

PUBLISHED BY FORD MOTOR COMPANY OF CANADA, LIMITED, FORD, ONTARIO, CANADA

No. 9 | FEBRUARY, 1924 | Vol. 5 | Page 63

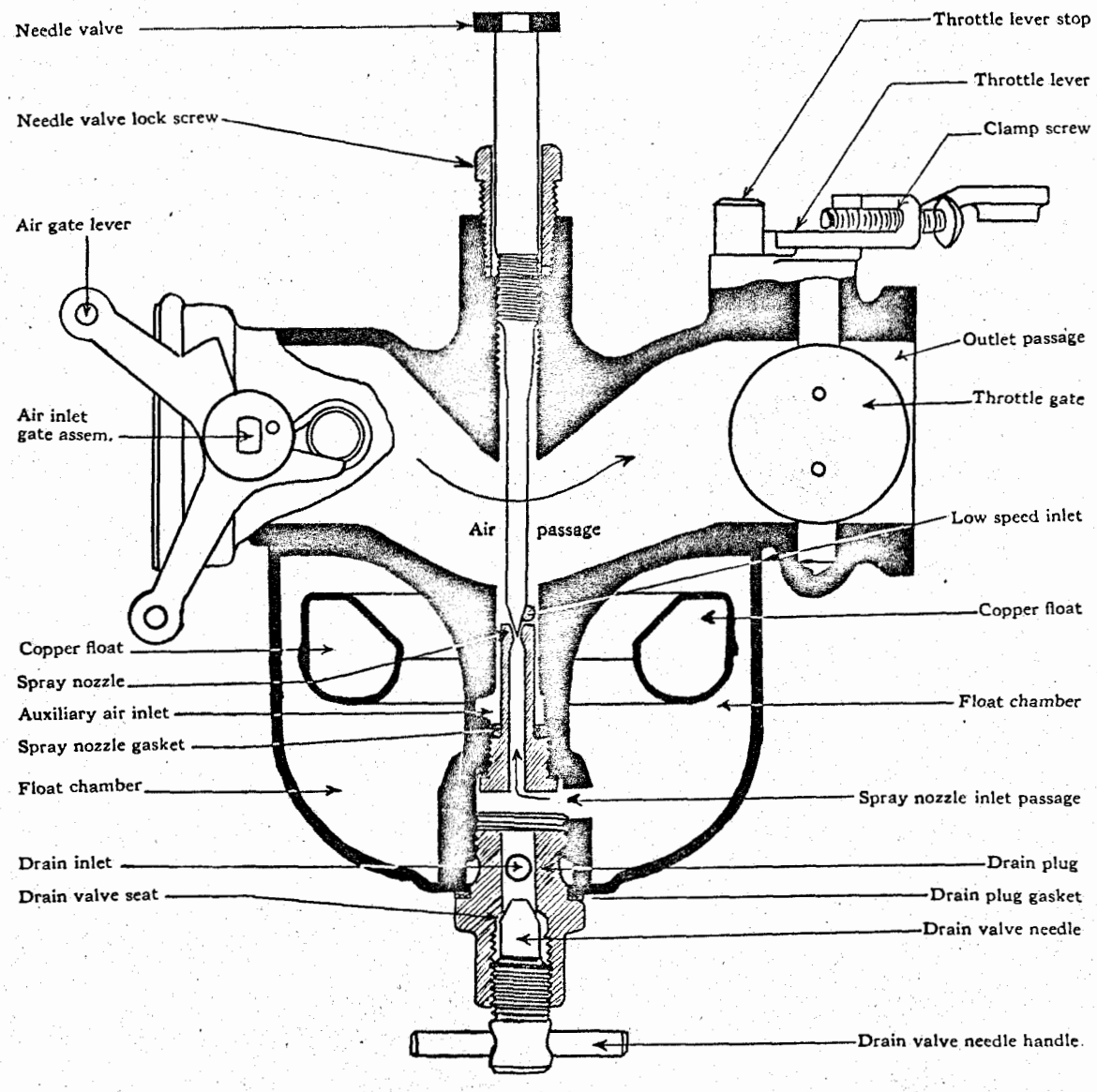


Fig. 70

Ford Mechanic's Section

(Continued from Page 59, January, 1924, Service Bulletin)

Fuel System

Under principles of internal combustion engines we explained how on the first or suction stroke of the motor, the fuel is drawn into the motor by the pumping action of the piston. This fuel is a mixture of gasoline and air in the proportions of from one part gasoline to 14-16 parts air by weight.

In order to make this mixture of gasoline and air burn properly inside the cylinders, it is necessary that they be thoroughly mixed with one another. This mixing operation is accomplished by the carburetor.

In the earlier days of the automotive industry the grade of gasoline was much higher than it is at the present time. This higher test gasoline was more volatile and mixed very readily with the air, in fact, it vaporized so easily that all that was necessary was to pass the air over a small amount of gasoline and the air picked up sufficient vapor to support combustion.

As the demand for fuel increased, the gasoline naturally became less volatile, this demanded more efficient mixing devices which would cause the gasoline to be sprayed into the air in order to thoroughly mix and vaporize it.

The present type of Holly NH carburetor is especially designed to handle this lower grade fuel. As the main source of supply (the gasoline tank) is usually located some distance from the carburetor or mixing device, it is necessary to carry a small supply of gasoline in the carburetor itself.

This is carried in the float chamber and serves two purposes—to maintain a supply of fuel to take care of a strong demand for fuel due to quick acceleration of the motor and also to maintain a constant level of fuel in the spray nozzle. This fuel level is maintained by a copper float which raises and lowers an inlet needle valve (see Fig. 71) to and from a bevelled seat.

As the fuel is lowered in the float chamber the float lowers with it allowing the needle valve to lower away from the seat and allowing the gasoline to flow into the float chamber by gravity from the tank.

In this way a constant level of fuel is maintained. This fuel level is a very important factor in the operation of the carburetor in that if too high, too much fuel will be admitted causing a loading and the motor will run unevenly, carbon will quickly form in the combustion chamber and on the valve seats. If the level is too low the motor will be hard to start and will also lack power at low speeds. The correct height for the fuel is approximately 1/64 of an inch below the top of the spray nozzle. This can be determined by measuring from the top of the float to the machined surface above the float chamber gasket. The measurement should be between $\frac{5}{16}$ and $\frac{3}{8}$ of an inch for best results. As this distance varies with different carburetors, it may be necessary to remove the carburetor several times before a correct adjustment is attained.

Action of Spray Nozzle

As the air rushes in through the air passage a strong suction is caused at the top of the spray nozzle which draws the gasoline into the air passage in a spray allowing it to become throroughly mixed with the air before passing into the cylinders.

To assist in this an air space around the spray nozzle is used, called the auxiliary air passage. The air is fed into this passage from the left hand side of the carburetor just above the float chamber; the inlet hole is partially covered by the name plate which also serves to keep the dirt from falling directly into the passage.

This passage allows a rush of air upward around the spray nozzle causing the fuel to enter the main air passage above in a spray.

Needle Valve Adjustment

The amount of fuel which passes from the spray nozzle is governed by the speed at which the air passes through the mixing chamber or air passage and also by the needle valve which is regulated by hand and works to and from the spray nozzle seat. The average setting of a needle valve is $\frac{7}{8}$ of a turn to the left, from a full closed position.

Low Speed Tube

Figure 71 shows low speed tube inlet just above the spray nozzle. This tube runs inward, toward the front on the main air passage, from it are drilled two small passages which lead into the main passage just ahead of the throttle gate when it is in a closed position. The purpose of this tube is to give a richer fuel mixture for starting and operating at low speeds.

By placing the outlet just ahead of the throttle gate, we get a very strong suction

direct from the motor on these outlets when the throttle is closed or partially closed and as the inlet for this passage is just above the spray nozzle, we get a richer supply of gasoline.

When examining a carburetor, always inspect this passage. If it is clogged or partially filled with dirt, the carburetor will not function properly. The Holley NH carburetor is very easy to understand and repair.

The float chamber may be easily inspected by placing the drain valve nut in a vise and turning the carburetor body anti clockwise; when the drain valve has been removed, the bowl can be removed exposing the float, float needle valve and seat and lower part of the spray nozzle. These parts can also be removed from the float chamber if clogged or not functioning properly.

NOTE—For explanation of the Lincoln carburetor see November 1923 Service Bulletin.

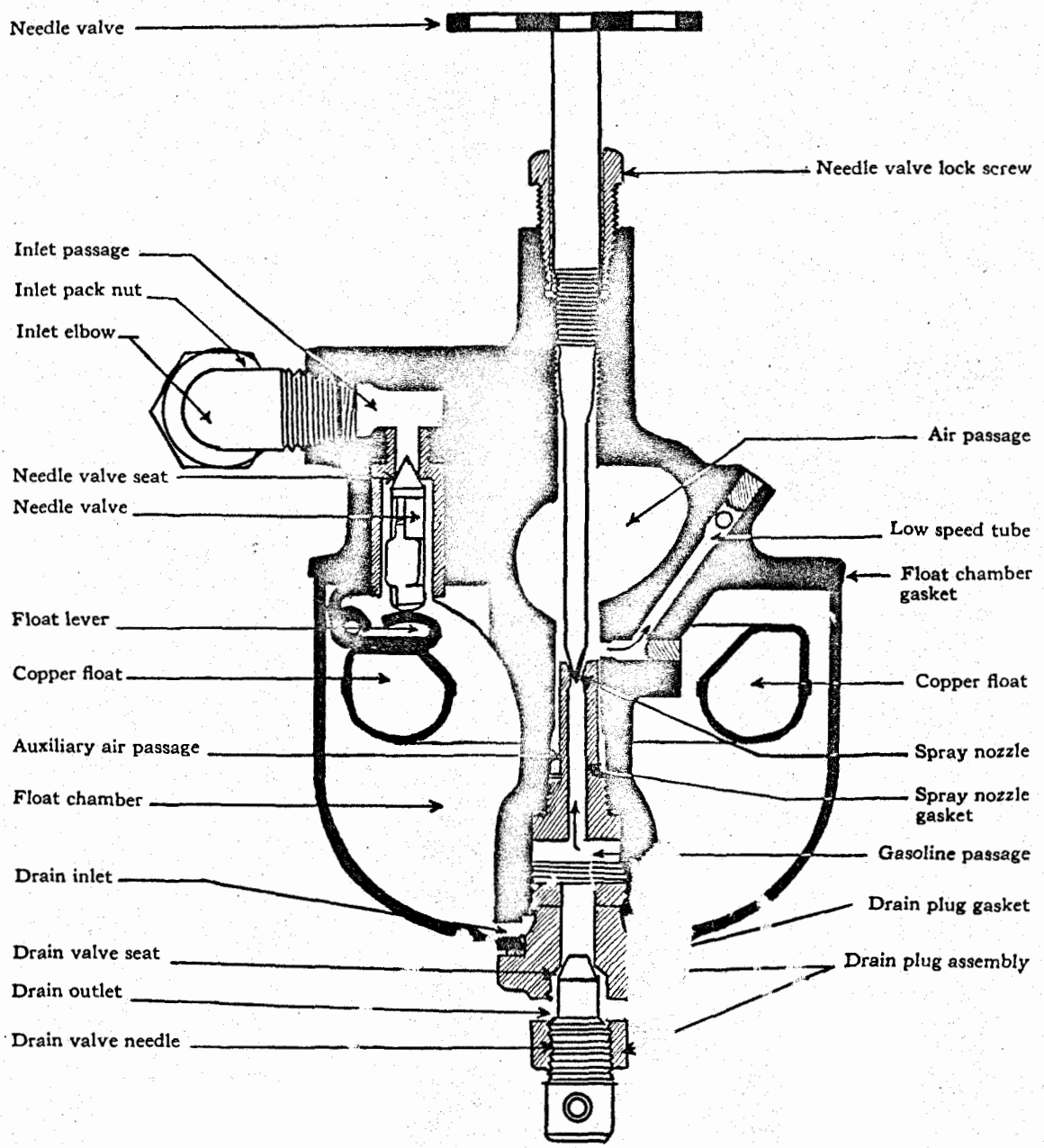
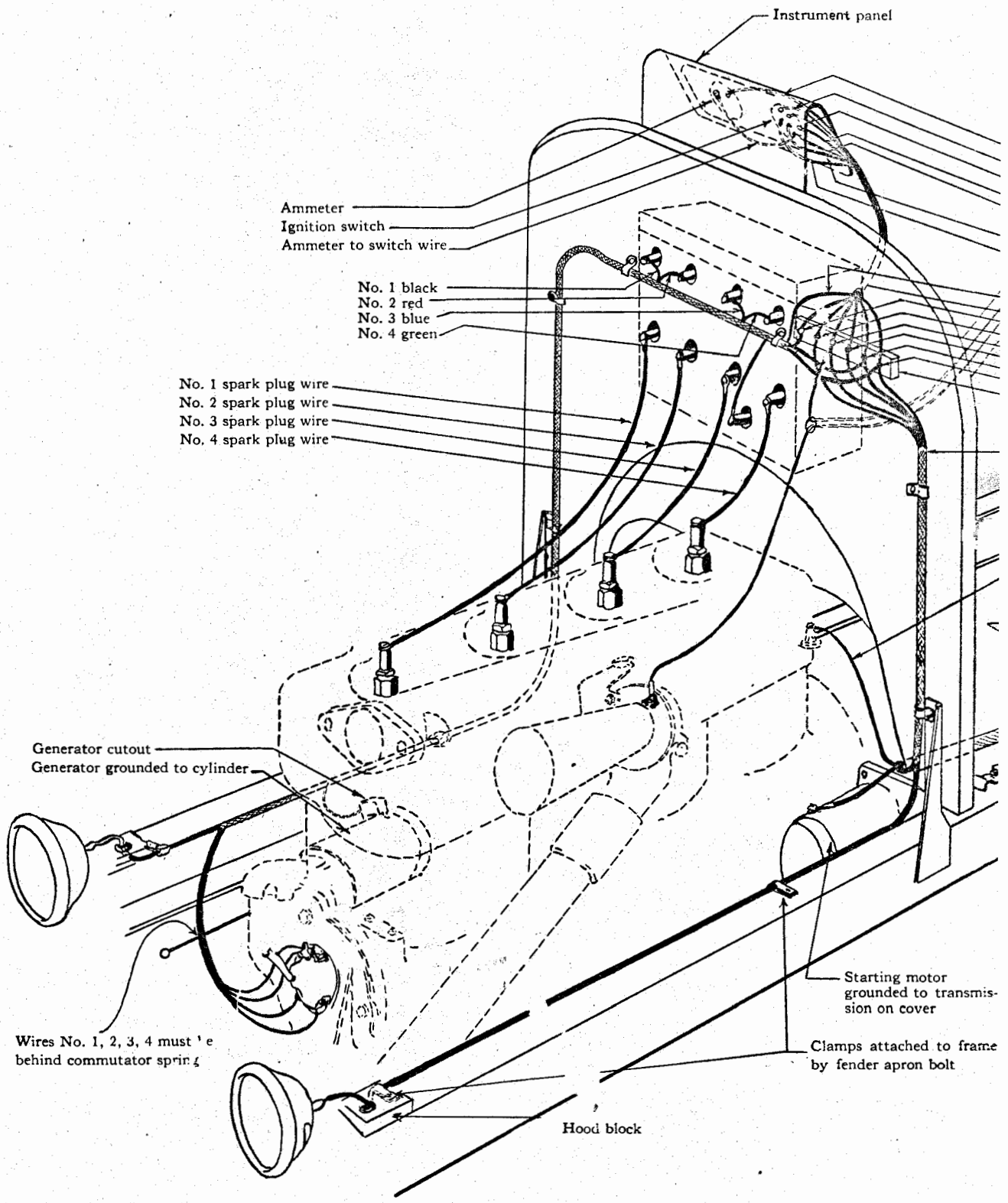
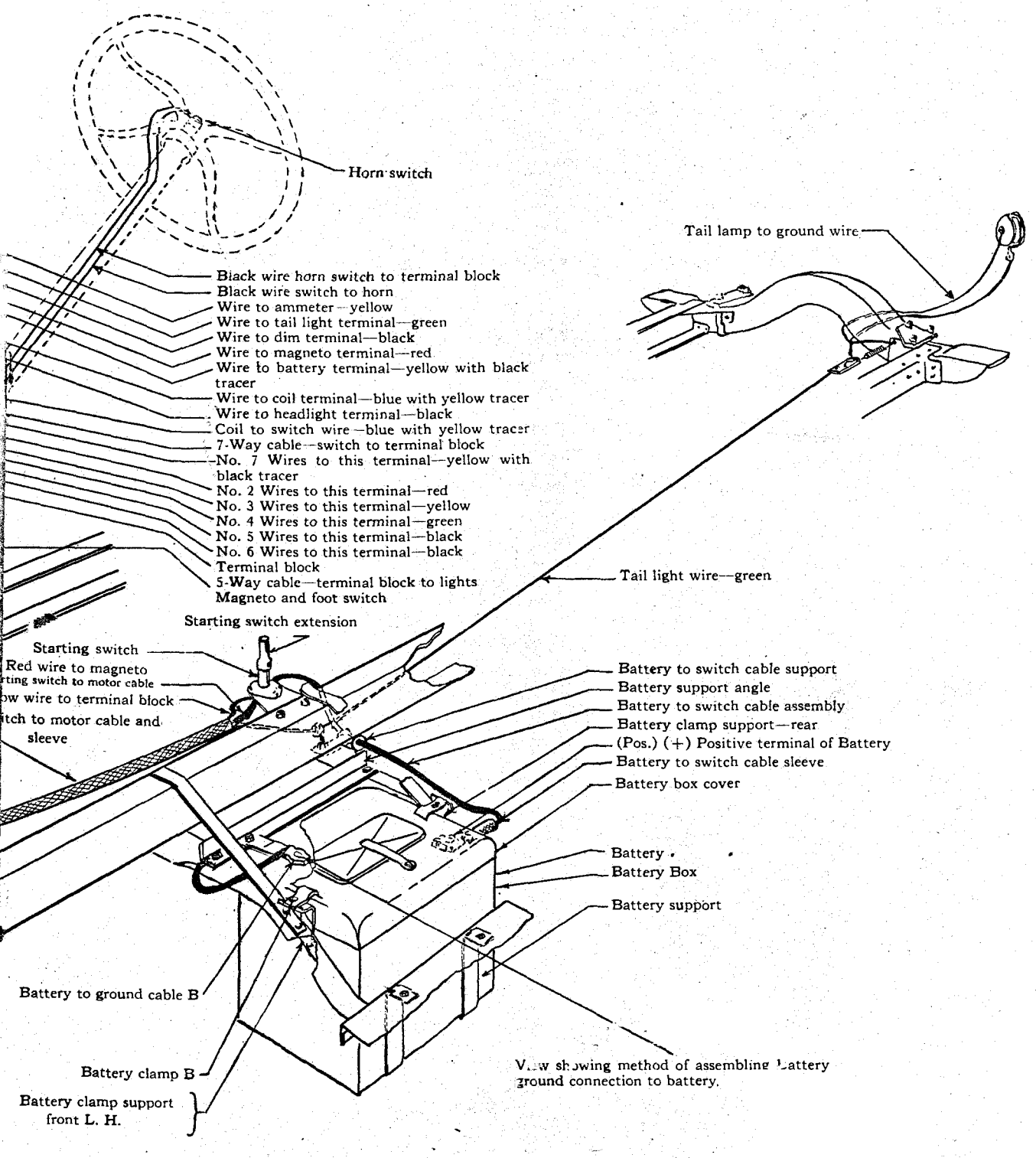


Fig. 71


Instrument panel
Ammeter
Ignition switch
Ammeter to switch wire
No. 1 black
No. 2 red
No. 3 blue
No. 4 green
No. 1 spark plug wire
No. 2 spark plug wire
No. 3 spark plug wire
No. 4 spark plug wire
Generator cutout
Generator grounded to cylinder
Wires No. 1, 2, 3, 4 must be behind commutator spring
Starting motor grounded to transmission on cover
Clamps attached to frame by fender apron bolt
Hood block



WIRING DIAGRAM T T CHASSIS L. H. C.

Lincoln Steering Gear

The worm and sector semi-reversible type steering gear is used on the Lincoln car and is adjustable for wear.

The steering gear usually requires little attention. The gear housing is filled with lubricant at the factory. With ordinary usage, an inspection every 2,000 miles will be sufficient. If the lost motion or back lash at the steering wheels becomes too great, an adjustment should be made.

Should the car seem to steer harder or stiffer than normal see that the front tires are inflated to the normal pressure. If so, then examine the front wheels and see that they are in proper alignment. If the fault is not here, then jack up both front wheels clear of the ground and turn the steering wheel. If it turns hard the trouble is probably due to insufficient lubrication. Fill the gear housing with one pint of gear lubricant.

NEVER put cup grease into the steering gear housing. Examine carefully all working parts not enclosed in the housing, and see that they are well lubricated. Thoroughly lubricate with gear lubricant all the steering mechanism of the front axle, including both ends of the steering connecting rod or drag link.

REMOVAL OF COMPLETE STEERING UNIT—The steering gear can be removed without disturbing the engine or body.

To remove the steering gear, proceed as follows:

Disconnect horn wire from terminal on the junction block located on right hand side of the dash under the hood.

Remove floor and toeboards from the driving compartment. Disconnect the spark throttle and the tilting headlight operating rods at bottom of column.

Remove the screw (25)Fig. 72 and pull off the steering arm (28).

Remove the sector eccentric bushing lock (26).

Unbolt 3 bolts (24) also 1 (27).

Uncap the bracket that secures the steering column to the instrument board and the steering gear ca be removed throug.i driver'scompartment.

In replacing the column observe the following precautions: First put in upper rear bolt (24). Then ca the bracket at instrument board. After th unit is bolted to the chassis frame omitting the lower rear bolt (27), make any adjustment necessary for back lash in the tee of the worm and sector. (Always have wheels in a straight ahead position when adjusting steering worm and sector). Replace the lock (26) and bolt (27).

Make sure that the steering wheel and front wheels are properly positioned, relatively, before securing arm (28) on the sector shaft (32)

LUBRICATION OF STEERING GEAR—The internal mechanism of the steering gear may be lubricated at (6) Fig. 72, with the lubricator gun provided in the tool kit. Use gear lubricant. NEVER use cup grease. An oil hole will be found under lever arm at back side under steering wheel (see Fig. 72), also oil all joints at top of steering column.

ADJUSTMENTS, INCIDENTAL TO WHEEL ALIGNMENT—At (31) Fig. 72 are two stop screws. These screws act as stops for the sector in the housing. They are properly adjusted when the car leaves the factory and will need attention only in case of re-

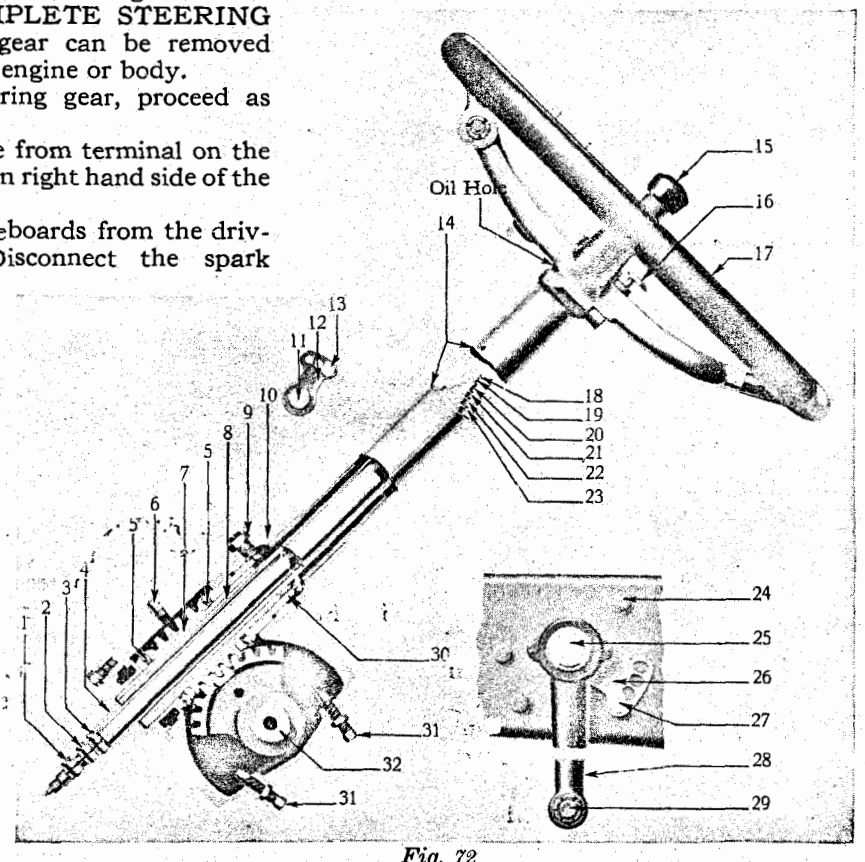


Fig. 72

alignment of the front wheels or accidents. In such cases the steering knuckle stop screws on the front axle MUST always be first set to properly limit the turning movement of front wheels. The sector stop screws (31) must then be set correspondingly. Locking nuts should be backed off and the screws (31) turned several revolutions in an anticlockwise direction in order to provide clearance for making adjustment of steering knuckle stop.

For example, when the steering wheel is revolved hard over in the position to give the car direction to the left, after having adjusted steering knuckle stop screws, to insure tire clearing nearest interference by from 3/8" to 1/4" when the wheel is revolving, the upper stop screw (31) is to be screwed in until it just touches the steering sector (32) without pushing the steering knuckle away from its stop more than 1/64 inch. Place a piece of paper between the steering knuckle and its stop screw on axle. When the sector stop screw (31) properly engages sector (32) the paper will fall or can be easily pulled out. Proceed same for steering to right then lock adjusting screws (31).

ADJUSTMENTS TO COMPENSATE FOR WEAR—Provision has been made in the design of the steering gear so that all wear which finally results in excessive back-lash at the steering wheel can be taken up.

Owing to the fact that tooth wear between the worm and sector cannot easily be distinguished from worm and sector end play when tested at the steering wheel, it is always advisable to make adjustment for tooth wear after an attempt has been made to eliminate back-lash play in worm and sector.

If this procedure is not followed, and an attempt is first made to reduce the back-lash by adjusting the eccentric bushing and bringing the teeth of the worm and sector together, it is probable that the teeth of the worm and sector will be crowded together with excessive force. This may appear to eliminate the back lash, due to friction alone but it is done in a manner which will probably introduce destructive wear of teeth and a sacrifice of steering qualities.

By proceeding as advised, first eliminating end play in the worm and sector, it is possible to adjust the teeth of the worm and sector together as directed under "To Take up Tooth Wear in Worm and Sector," and reduce the back-lash at wheel to a satisfactory condition, which should be a minimum of 3/8 inch, measured at circumference of wheel, for the best steering qualities.

TO TAKE UP END PLAY IN THE WORM—The end thrust of the worm (7) is taken on ball thrust bearings. Adjustment is provided to take up end play. To do this proceed as follows:

Loosen lock nut (9) and remove the lock screw, also the plug (located similarly but not shown). Then with a stout screw driver applied to the notches in the adjusting collar (30) which can be seen through the holes from which the lock screw and plug were removed, screw down (turn clockwise) the adjusting collar (30) until the endwise movement of worm is corrected.

The holes for the lock screw and plug are so positioned in the steering gear housing that when one is directly over a slot in the castellated end of the adjusting collar (30) the other will be between two of the slots.

After adjusting the collar (30) it will be necessary to insert the lock screw in the proper hole for locking the adjustment, and the plug in the other hole.

NOTE: Frequently after an ideal adjustment is made, the slots in the adjusting collar (30) will not register in the center of either locking screw hole. In such cases NEVER tighten the adjustment, but select the position which most nearly matches—and unscrew (turn anti-clockwise) the adjusting collar (30) until the lock screw can be inserted.

TO TAKE UP END PLAY IN SECTOR SHAFT—An adjustment is provided at the inner end of the sector shaft (32) for taking up end play. To do this proceed as follows:

Remove the locking screw (13) and without removing the locking arm (12) turn the adjusting screw (11) (clockwise) until all end play is compensated for, then replace locking washis compensated for, then replace locking washer and screw (13) and tighten.

NOTE: Frequently when an ideal adjustment has been made and all end play and wear is compensated for, the holes in locking arms (12) or (26) will not register with screw holes by which they are to be secured. In such cases NEVER turn the adjustment up tighter, but loosen it until locking screw can be applied This caution applies most particularly to the adjustment for wear between teeth of worm and sector.

TO TAKE UP TOOTH WEAR IN WORM AND SECTOR—This should be the last adjustment to be attempted when it is desired to take back-lash out of steering wheel.

The sector (32) has its bearing in an eccentric steel bushing and wear between the teeth of the worm (7) and sector (32) may be taken

up by turning this eccentric bushing so that it throws the sector into closer mesh with the worm. To do this proceed as follows:

First turn the front wheels so that they point straight ahead. Unscrew the nut on the inside of frame from bolt (27) and withdraw the bolt. This releases the arm (26). To take up wear in teeth, turn the arm (26) down (clockwise). This should be carefully done as it is possible to apply a heavy load with this adjustment. There should be a perceptible amount of play after this adjustment is complete.

Lincoln Transmission Lubricant

In cold weather, if difficulty is experienced in shifting gears with a cold engine the transmission lubricant should be thinned with about 50% engine oil. This also applies to the rear axle as the pinion bearings will not receive proper lubrication when the lubricant solidifies due to extreme low temperatures.

This point is very important, especially with reference to the rear axle as the pinion shaft bearings are liable to be destroyed through running dry.

New Style Battery Box for Truck

Figure 73 illustrates the new style battery box installed in the truck chassis.

This box assembly is identical with the battery box used in the Model T car and replaces the old truck battery box.

By studying the cut you will be able to understand the method by which it is assembled in the cradle between the two running board brackets.

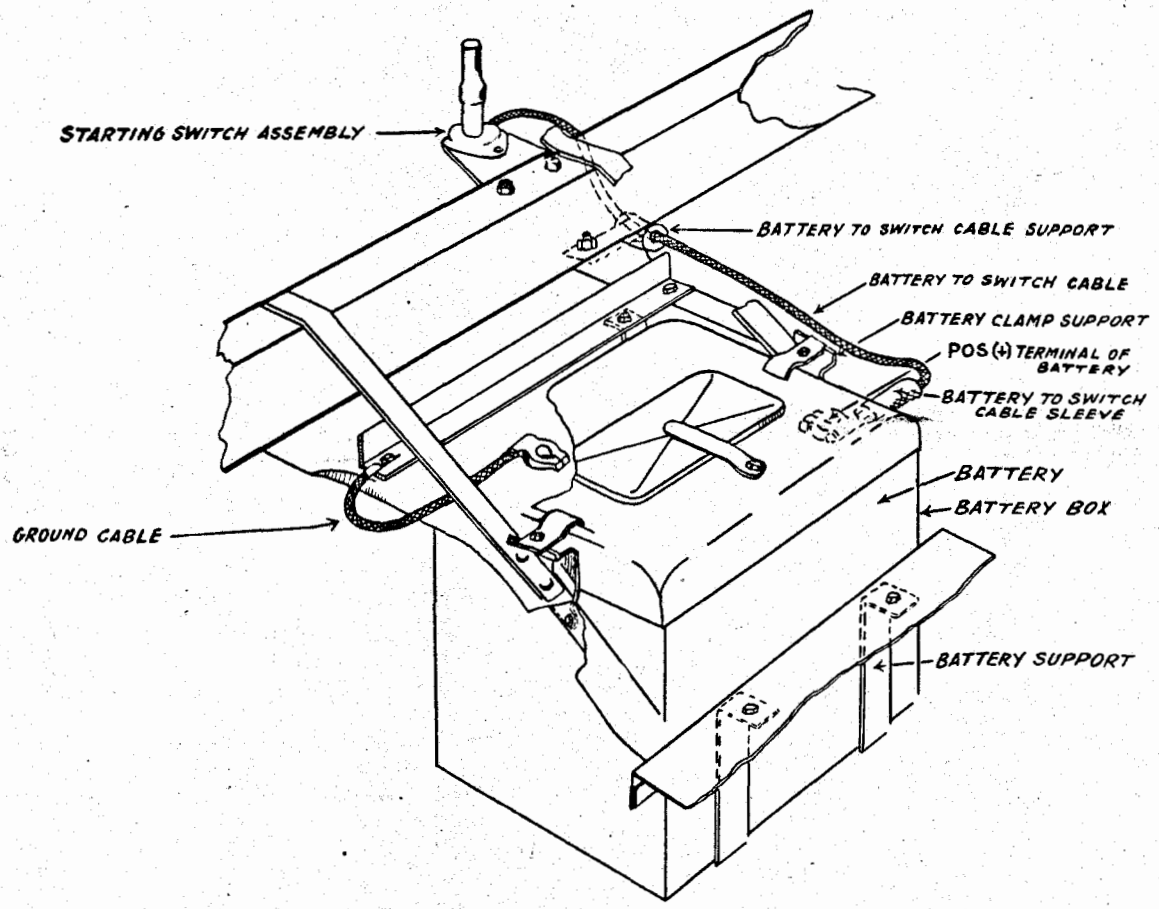


Fig. 73