

Oil once each month with **light, fine oil**. Remove motor cover in rear and drop a few drops of oil at each end of the armature shaft in the oil hole or groove indicated on illustration.

If horn fails to give proper results after bearings have been oiled, set the motor in motion by pressing button, and sand paper commutator. After this has been done, clean air gaps between commutator segments with piece of wood. Do not use metal of any kind for cleaning air gaps.

**ADJUSTMENT:** Turn adjusting screw in rear end of motor cover (a dime will serve as a wrench) to the right to tighten, to the left to loosen, until the desired tone is attained.

Do not adjust too tightly. The armature should always turn easily, when turned with the fingers.

If horn fails to operate, do not take it apart—you may lose some essential part. Oil and clean carefully in accordance with above instructions. If this does not cause it to operate examine the wiring, battery and push button.

If trouble cannot be found send the horn by parcel post to the factory where it will be taken care of promptly in accordance with the Sparton guarantee. With the horn should be sent a letter giving the serial number of the car, length of service, and a description of the trouble.

A regular charge will be made for cleaning, oiling and adjusting, made necessary by lack of attention on the part of the owner.

In ordering parts for horn, always specify model and serial number of the horn which are designated by letters imprinted on the name plate.

# CLUTCH INSTRUCTIONS FOR 4-44 MODELS

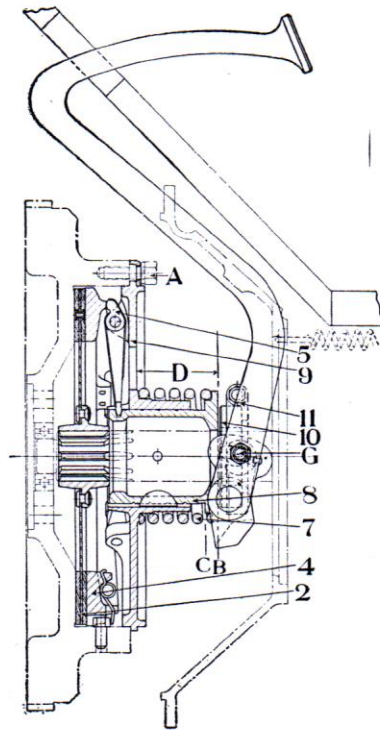


Fig. 1

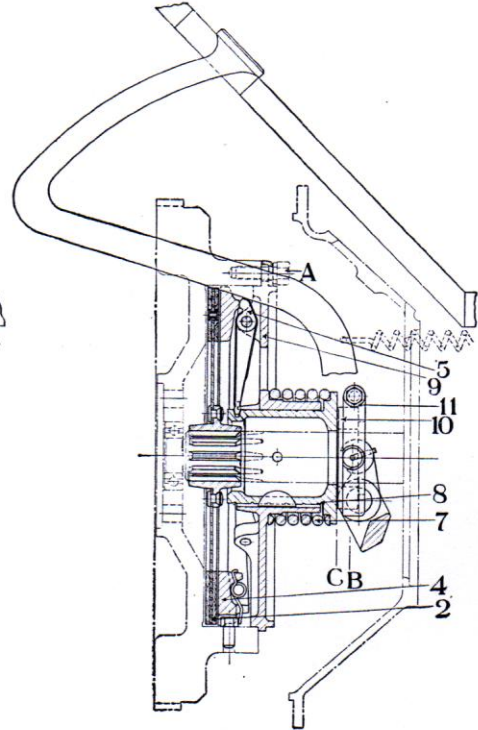


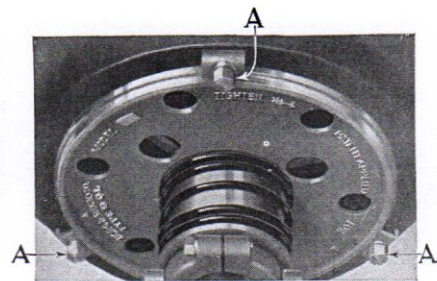
Fig. 2

The Borg and Beck Clutch described below is of the single Plate Dry Disc type.

Release is accomplished by moving the release bearing toward the flywheel, the heavy spring (7) which provides driving pressure being located on the rear face of the clutch cover (9). All parts of the clutch except the driven plate are locked to the flywheel and rotate with it, the driven plate coming to rest when the clutch is released.

The release sleeve (8) is supported in the hub of the clutch cover and does not run on the shaft. It is prevented from turning in the cover by a key. The rear face is made wide and smooth to provide contact for the release bearing.

The release bearing (10) is made of a special graphite composition



Clutch Face

and is carried in a throw out cup (11) mounted on the pedal shaft throw out yoke. When the clutch pedal is depressed to release the clutch, the bearing is moved forward against the flat, smooth surface of the release sleeve.

Three pressure levers (5) are mounted directly on the clutch cover (9). The outer ends of these levers bear against the three cam surfaces of the pressure plate (4).

As the clutch facings wear, the pressure plate (4) moves closer to flywheel face, and the outer ends of levers follow. This causes inner ends of levers and release sleeve to travel farther toward the transmission, and decreases clearance between face of sleeve and release bearing. The effect on clutch pedal is to decrease clearance under toe board, which is the distance pedal moves away from toe board before release bearing (10) comes in contact with sleeve (8). The clutch adjustment is provided to compensate for facing wear, and by turning clutch cover clockwise into a new position, the three levers move higher on the cams and bear at thicker sections of the pressure plate. Thus the sleeve travel is decreased and the space between release bearing and sleeve, as well as pedal clearance under toe board, is increased.

**CAUTION:**

Do not slip clutch excessively instead of shifting gears.

Do not drive with foot on clutch pedal.

If clutch starts to slip, have it adjusted immediately, as the friction due to clutch slipping causes excessive heat and may ruin clutch.

It is important to understand and remember that compensation for wear should be taken care of by adjusting the clutch. Do not change clutch pedal adjustment to correct toe board clearance. Carefully follow clutch adjustment instructions.

The clutch is accessible by removing toe board and hand hole plate on bell housing.

**TO ADJUST CLUTCH:**

1. Loosen all holding screws until clutch cover will turn in flywheel.
2. Turn clutch cover about 1/2 inch in the direction opposite to flywheel rotation, as indicated by arrow, on clutch cover.
3. Tighten holding screws.
4. Now measure distance from rear face of release sleeve to clutch cover. This distance should be 2-3/16 inches, and a gauge made of wire with a 2-3/16 inch bend at one end may be used to advantage.
5. If this space is more than 2-3/16 inches, loosen holding screws as above and turn in same direction. If less than 2-3/16 inches, turn cover back in the direction of flywheel rotation. After correct setting has been obtained, be sure holding screws are tightened.

This completes clutch adjustment.

**TO ADJUST PEDAL:**

This is correctly set at the factory and should not require changing. However, if necessary to correct setting proceed as follows:



The pedal pad should come in contact with toe board when pedal is pressed down. If a solid obstruction is encountered before moving that far, shift pedal down a little by means of clutch pedal adjustment.

Press pedal down and note distance release sleeve travels. It should be pushed toward flywheel about 5/16 inch, which is necessary for a clean release. If it does not travel that distance, shift the pedal up, bearing in mind that pedal pad must touch toe board as above.

The clutch pedal adjustment has now been set in its correct position and should not be changed again, because adjusting the clutch automatically restores clearance under toe board.

If the clutch is to be removed from the flywheel, first remove all holding screws and clamps, which allows the cover assembly to come off; then the pressure plate can be lifted out. Next remove the dowel pins with pliers and last the driven plate assembly.

When placing driven plate in flywheel, be sure that flange end of hub is toward the outside. Place small amount of hard oil in splines.

Pressure plate must slide freely on the three dowel pins in the flywheel. Do not file slots if the ring sticks. See that pins are turned so that flat sides are parallel with slots in plate.

Line up pilot bearing and driven plate with stub shaft before tightening clutch cover holding screws. Tighten holding screws before pulling out shaft.

**Do not under any circumstances let transmission hang in clutch assembly.**

## TRANSMISSION

The Transmission used on our Model 4-44 has four speeds, three forward and one reverse, which are controlled by the hand shifting lever.

The transmission consists of the case, containing two shafts, a main or sliding gear shift, and a countershaft, a main shaft drive gear, and a series of gears, together with bearings and means of adjustment.

The main shaft is in a direct line with the main shaft drive gear, or constant-mesh pinion, the end of the main shaft turning in a Hyatt Roller Bearing in the end of the main drive gear. The countershaft is parallel with the main shaft and is stationary, the gear revolving on bronze bushing.

The main shaft carries two gears of unequal size designed to slide into mesh with gears of correspondingly unequal size on the countershaft.

One of the sliding gears may also be moved into mesh with the reverse idler gear which is on a shaft supported by the transmission case, thus obtaining the change called "reverse."

The countershaft carries the following revolving but non-sliding gears: countershaft drive gear, intermediate or second-speed gear, low-speed gear, and reverse gear. Although the countershaft drive gear is always in mesh with the main shaft drive gear it does not transmit power when in direct or high gear. However, it keeps the lubricant agitated and in circulation, which is essential.

The transmission is so constructed to be oil-tight. To prevent oil leakage the shifter rails in the top housing are a drive fit, as are also

the countershaft and idler gear shaft. Care must therefore be used in handling these parts when dis-assembled, so as to avoid battering and damaging them. Should any oil be found on the case, the reason for the leak should be sought immediately.

Just back of the bearing, at rear end of main shaft, there is a space that contains the speedometer parts. Oil is prevented from leaking out of this space around the sliding gear shaft by the use of a double oil fling. If grease were to be put in the transmission case the drain hole from this space or chamber might become plugged up, thus causing oil to overflow at this point. Any undue gear noise may be due to an improper kind or amount of lubricant. When refastening the transmission to the engine after overhauling is done, care must be taken to see that all burrs are removed from the face of the bell housing. The bell of the transmission housing must be drawn up tightly against the engine flywheel housing to prevent misalignment.

Be careful with the lubrication. See that the right grade of oil is used whenever necessary. Some grades of oil sold for transmission lubrication function satisfactorily in moderate weather but become very heavy and stiff at low temperatures, not only making gear shifting difficult, but in some cases actually resulting in damage to the parts, such as breaking of shift levers, or bending of gear shifting forks, due to forcing the shift too much.

If a too heavy-bodied lubricant is used, there is a tendency either to throw out to the side walls of transmission case or to "channel out" in such a way that very little lubricant actually gets on the gear teeth, or into the bearings and bushings. Some lubricants are so light that when thoroughly whipped up or in warm weather they result in noisy gears. It is recommended by our Engineering Department that when cold weather appears, the transmission case be thoroughly cleaned out with kerosene, and then filled again with a high-grade transmission oil, such as 600-W, Mobiloil C, Polarine transmission oil, or something of equal lubrication strength, adding to it about 10% of kerosene.

As soon as freezing weather is over, the transmission should be drained, cleaned and refilled with any of the above oils, but not adding kerosene.

The transmission oil filler plug is located at the left side of housing, and lubricant should reach the level of this plug.

### EMERGENCY BRAKE ADJUSTMENT

The Emergency Brake on our 4-44 Models is easily accessible as it is located on the transmission, and is controlled by brake lever to the right of shifting lever. It can easily be reached for adjustment by lifting the floor boards.

Two points of adjustment are all that are necessary. The brake band and lining may be adjusted at "X" (as shown in cut,) so as to obtain a firmer grip on the drum, and the ends of the brake band and lining may be adjusted at "Y".

At the brake anchor "X" turn the screw to the right until the clear-



ance between the lining and the drum is about one thirty-second of an inch, and at "Y" turn the nut upon the bolt to the left until the clearance at both ends of the band and lining is approximately one thirty-second of an inch. When it is necessary to remove the brake band for relining, the bolt "Z" can be easily removed by unscrewing nut "Y".

Keep movable parts well oiled. The clevis pins at brake connections should have a few drops of lubricating oil at least once a month.

