2. **Place flywheel on bench,** with gear side up.
3. Force a ball race into the flywheel casting. This must go in evenly and come to a seat evenly, otherwise the bearing will quickly destroy itself.
4. Assemble the balls and clutch-spring tension rod, packing the balls in grease.
5. Slip the clamp shown in Fig. 20 over the end of the stud. This holds it firmly in place and permits one man to put on the retaining springs.
6. Slip three old valve springs over the end of the stud and pin in place, as shown. The clamp may now be removed, and the stud, with the thrust bearing, cannot fall apart in reassembling the clutch.

   An alternative method, and one commonly used in assembling the tension rod and bearings is to place the ball race, balls and tension rod together before placing them in the flywheel. They may be held together by the three valve springs.
7. Lift the flywheel back into place on the engine. Bolt it back in the same position as before it was removed. Do not tighten any one bolt until all are drawn snug. This removes the possibility of having the flywheel out of true, which would ruin the thrust bearings.
8. Remove the pin and three old valve springs from the clutch-spring anchor stud.
9. Force the clutch back into position.
10. Bolt the clutch hub to the clutch spider. Draw all bolts up snug, before any one is tightened.
11. Put the clutch spring back in place and pack with grease.
12. Using the compressor shown in Figs. 18, 17, or 19, replace the clutch-spring retaining pin.
13. Lift the gearbox back into the frame. It will have to be sprung past the gearbox side-arm.
14. Replace the bolt holding the gearbox side-arm to the engine.
15. Replace the bolts on the rear clutch-hub drive ring. Bring all up snug together.
16. Replace the bolts holding the gearbox to the side-arms. (Make certain that the shims are replaced exactly in the same position from which they were removed.)
17. Replace the clutch release shaft with the clutch yoke and pedals.
18. Connect the brake rods.
19. Replace the V-brake, connecting gearbox support with engine.
20. Refill the oil reservoir on the clutch yoke and the grease cups on the clutch cross-shaft. Oil all working parts.
21. Replace the wiring. Start the engine and note whether everything seems to be working properly. If there is a rattle in the clutch drive ring it will indicate that the gearbox is out of line. The shims will have to be shifted, or possibly removed. When perfect alignment is reached, the rattle will cease. (*Motor World.*)

PARTS OF BORG & BECK SINGLE-PLATE CLUTCH; ASSEMBLY AND ADJUSTMENT

General Description

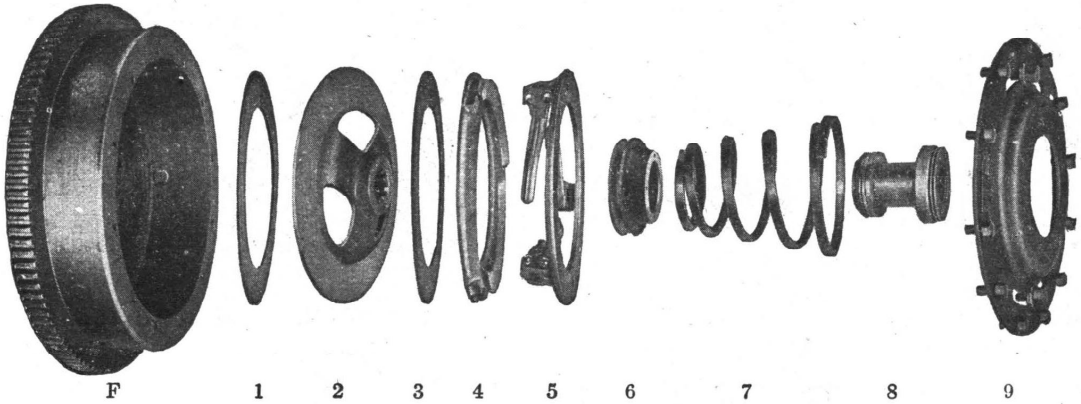
This clutch is termed a "single-plate clutch" because a single dry disk or plate (2) (Fig. 23) is locked to rotate with the flywheel by gradual pressure between two asbestos facings, or rings (1) and (3), thus driving the clutch shaft (S) (Fig. 26) that carries power to the transmission.

In two-bearing clutches[1] (Figs. 26, 27), all of the clutch except the driven plate (2), facings (1, 3), sleeve (8), and shaft (S), rotate at all times with the flywheel.[2] The sleeve (8) is keyed to shaft (S).

In single-bearing clutches[1] (Figs. 28, 29, 30) the sleeve (8) is not keyed to the shaft (S), and rotates with the flywheel.

The holding action is obtained by gripping the driven plate (2) between the friction rings (1 and 3) and the flywheel (F) and thrust ring (4) of the clutch. A spring (7), operating against three bell-crank levers (L), applies pressure to the thrust ring.

The friction or driven plate (2) is mounted on the clutch shaft (S) by a splined fitting. It rotates between two wire-corded asbestos facings (1, 3) which are free to float in the flywheel. The facings absorb the



F 1 2 3 4 5 6 7 8 9

Fig. 23. **Parts of the Borg & Beck dry-plate clutch.** (F) represents the flywheel ready for the clutch parts, which are shown disassembled in the order in which they are to be assembled. Note that inside of the flywheel the dowel pins that carry the thrust ring (4) are shown projecting (see also (P) Fig. 26.) The Borg & Beck Co., Chicago, are the manufacturers.

(1) **Friction ring,** a duplicate of No. 3. These rings take all the clutch wear.

(2) **Friction disk,** or dry plate, keyed to the shaft by 10 splines.

(3) **Friction ring;** copper reinforced woven asbestos.

(4) **Thrust ring;** note the inclined face toward the center, and adjustment inclines.

(5) **Mounting ring;** fastens to the cover with adjustment bolts; it carries the bell-crank levers.

(6) **Retractor collar;** the ends of the bell cranks engage in slots

(7) **Spring** is compressed between cover (9) and the retractor collar; it operates the bell-crank levers.

(8) **Sleeve** carries retractor collar; note the thrust bearings.

(9) **Clutch cover** bolts to the flywheel; note the adjustment bolts in the slots which are shown as (A) in Fig. 25.

[1] See footnote page 847. [2] **Parts 1, 2, 3, and 8 come to rest when the clutch is disengaged.**

wear caused by slippage during engagement. When engaged, all parts are friction-locked into a solid unit and revolve with the flywheel. The driven plate (2) and shaft (S) come to rest when the clutch is released.

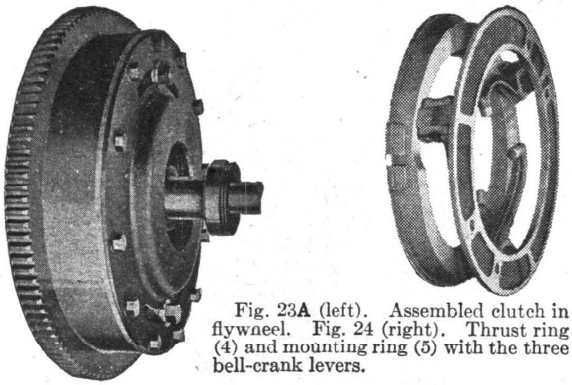


Fig. 23A (left). Assembled clutch in flywheel. Fig. 24 (right). Thrust ring (4) and mounting ring (5) with the three bell-crank levers.

The friction surface of the thrust ring (4) is a flat polished surface. The opposite face is a tripple cam surface against which pressure is applied (see Fig. 24). It is inclined radially to take the wedge action of the thrust shoes, and the three cam surfaces on the rear face provide adjustment. Three equally spaced dowel pins (P) (Fig. 26) drive the thrust ring (4) with the flywheel. It is mounted freely, however, to permit a slight forward and back movement as the pressure is applied or released.

The adjustment or mounting ring (5) carries three bell-crank levers (L) (Fig. 26) which transmit the spring pressure. Two slots are provided in the clutch cover (Fig. 25) that allow adjustment of this ring. It is bolted to inside of cover by the two adjusting screws (A). It should be readily understood that the pressure shoes come in contact with a thicker section of the thrust ring (4), or higher on the cams, when they are moved to the right, or clockwise, into a new position. This compensates for wear on the asbestos facings (1 and 3).

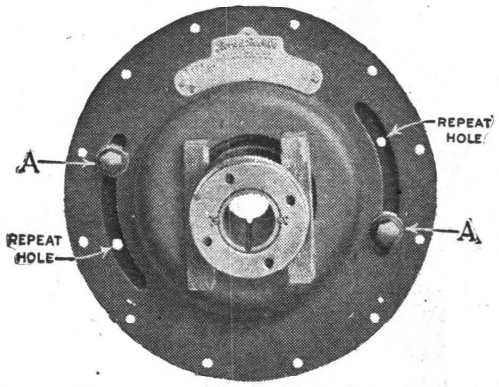


Fig. 25. View showing adjusting bolts (A) and slots.

Clutch troubles are not frequent. Ninety per cent of those which do occur are caused by failure to adjust when necessary. The pedal moves toward the floor-board as the clutch wears. Clearance must always be maintained between pedal and floor-board. Adjusting the clutch restores this clearance. Do not change pedal adjustment instead of adjusting clutch (see footnote, page 848).

Adjust the clutch (not the clutch pedal) at once, should it start slipping. The better plan is to inspect at intervals and adjust before slipping starts.

General Remarks on Adjusting

Refer to all illustrations (Figs. 26 to 30); **(A),** adjustment bolts; **(B),** correct engaged position; **(C)** correct released position.

As the clutch facings (1 and 3) wear, the engaged position of the sleeve assembly (8) changes, allowing increased travel toward the flywheel. The clutch adjustment is provided to compensate for this wear, and by moving adjustment bolts (A) to the right, the sleeve (8) travel is decreased as much as desired to return sleeve assembly to normal.

The distance from the correct engaged position (B) to the correct released position (C) is ½ inch; in other words, when the clutch pedal is pressed down, the sleeve assembly should be pulled away from the flywheel ½ inch.

The released position of the forward end of the sleeve assembly is not affected by wear or clutch adjustment, and, when correctly set, is always the same distance from face of flywheel. There are several ways of measuring this position, but the easiest way is to remove hand-hole plate (by removing screws H, Fig. 27) and observe position of retractor collar (6), as shown in Fig. 27.

A gauge made of wire with a bend at one end may be used

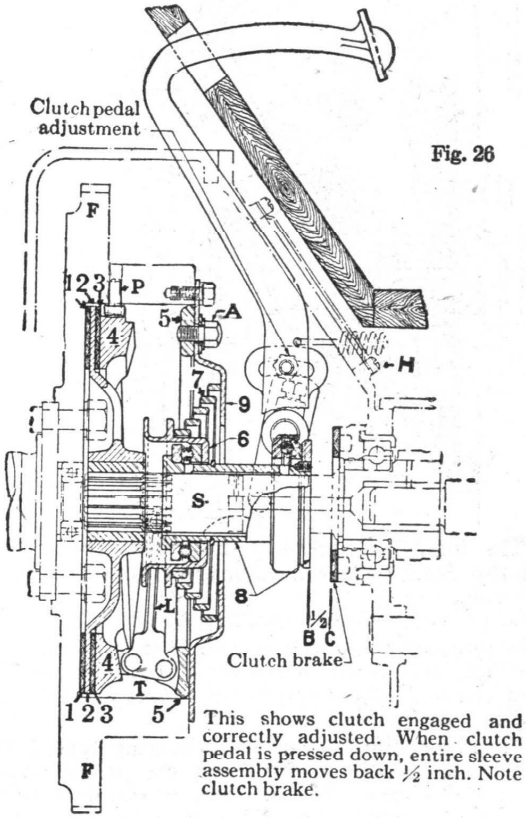


Fig. 26

This shows clutch engaged and correctly adjusted. When clutch pedal is pressed down, entire sleeve assembly moves back ½ inch. Note clutch brake.

To Adjust Two-Bearing Types

To adjust two-bearing types DX, DAX, DAX-1, GX, GX-1, SGX, SGX-1, RGX, JX, proceed as follows:[1]

1. Loosen both adjustment bolts (see Fig. 25). As both bolts are screwed into the same mounting ring (Fig. 24), moving one also moves the other.

2. Hold clutch pedal down. Move bolts (A) to the right, or clockwise, which tightens the clutch.

3. While the pedal is down, note position of retractor collar (6). The rear face of it should be about flush with the face of clutch cover (9) (see Fig. 27). If it is inside the cover, the pedal adjust-

[1] **The type of clutch can be found on name plate** located at front of clutch (see Fig. 25).

The **"two-bearing clutch"** refers to the two ball bearings, one at each end of clutch sleeve (Figs. 26, 27). The **"single-bearing clutch"** refers to the one bearing shown at right end of clutch **sleeve only in Figs. 28, 29, 30.**

ment should be changed, raising the pedal enough to bring retractor collar to that position.[2]

4. Let in clutch and note the distance that the sleeve travels. If more than ½ inch, throw out clutch and move bolt (A) to right. If less than ½ inch, move bolt (A) to left. After ½ inch travel has been obtained, tighten both bolts (A). This completes clutch adjustment. When bolts (A) reach the right ends of the cover clots (Fig. 25), due to repeated adjustment, remove them and screw into the repeat holes which have been exposed at opposite ends of slots, thus doubling adjustment range.

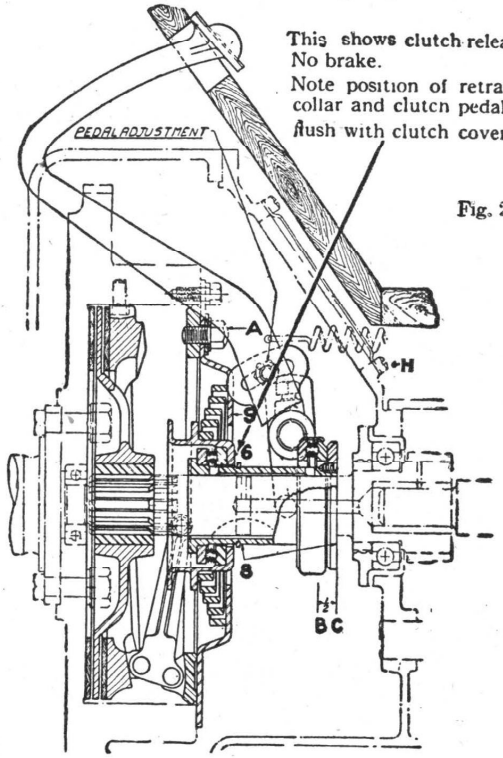


Fig. 27

The foregoing describes the manner of adjusting the clutch pedal where no clutch brake is used, allowing the pedal to be pressed down until it touches the floor-board (see Fig. 27).

Where a clutch brake is used, it is located at (C) position, and pedal adjustment should be set so that sleeve makes contact with brake before pedal touches the floor-board (see Fig. 28).

To adjust clutch of the two-bearing type DXY, follow instructions given above, except that when the pedal is down, the rear face of retractor collar (6) should extend about ¼ inch out of clutch cover (9). If it does not extend out that far, the pedal adjustment should be changed, raising pedal enough to bring retractor collar to that position.

To adjust two-bearing type FGX: All have clutch brakes. Adjust pedal as shown in Fig. 28, and adjust clutch to allow ½ inch travel of sleeve from engaged position (B) to brake (C).

To adjust two-bearing heavy duty types 13FX, FJX and single-bearing heavy duty type FJS: These have **three adjustment bolts instead of two, and all have clutch brakes.** Adjust pedal as shown in Fig. 28, and adjust clutch to allow a little more than ½ inch but not more than ⅝ inch travel of sleeve from engaged position (B) to brake (C).

[2] If the clutch pedal is adjusted alone without adjusting the clutch, the left end of sleeve (8) will come in contact with hub of driven disk (2) and will prevent spring from operating levers and thus cause clutch to slip. To correct, adjust clutch first and raise pedal adjustment afterwards.

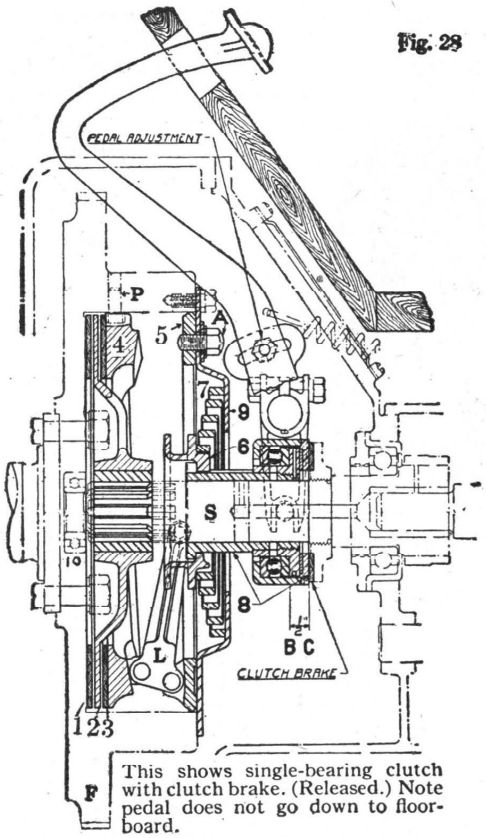


Fig. 28

This shows single-bearing clutch with clutch brake. (Released.) Note pedal does not go down to floor-board.

To Adjust Single-Bearing Types

To adjust single-bearing types, M, D, DN, DA, DU, GA, GA-1 follow instructions given above, except that when pedal is down the rear face of retractor collar (6) should be ½ inch in from face of clutch cover (9), as shown in Fig. 29. If more than ½ inch from face of cover, the pedal adjustment should be changed, raising the pedal enough to bring it to that position.

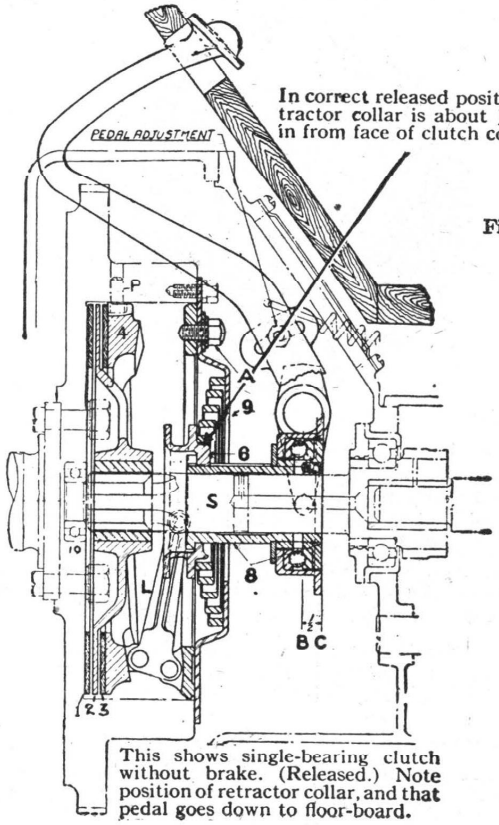


Fig. 29

This shows single-bearing clutch without brake. (Released.) Note position of retractor collar, and that pedal goes down to floor-board.

To adjust single-bearing types DS, G, G-1, GS, SGS, RGS, J, JS: These types all have clutch brakes. Adjust pedal as shown in Fig. 28, and adjust clutch to allow ½ inch travel of sleeve from engaged position (B) to brake (C) (see Fig. 30).

If the foregoing instructions are correctly followed, there will be proper clearance between floor-board and clutch pedal when clutch is engaged, as shown in Fig. 26.

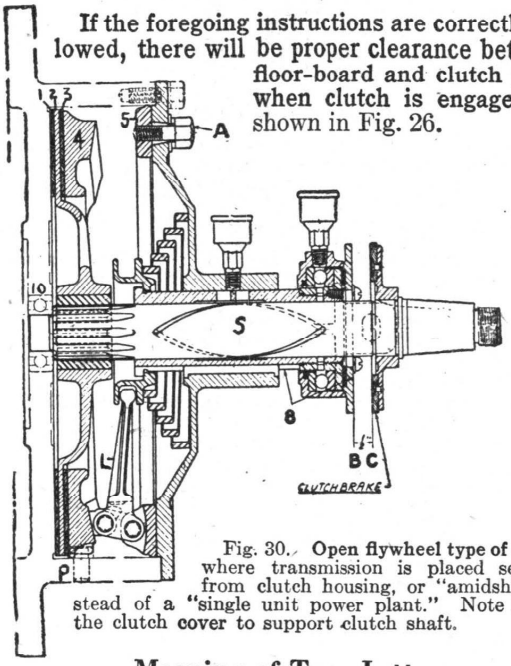


Fig. 30. **Open flywheel type of clutch,** where transmission is placed separate from clutch housing, or "amidship" instead of a "single unit power plant." Note hub in the clutch **cover** to support clutch shaft.

Meaning of Type Letters

The first clutches manufactured were of the single-bearing type, and the letter used referred to its diameter as follows: **M**—8 inch; **G**—12 inch; **D**—10 inch; **J**—14 inch. Latter types are indicated by adding letters as follows:

S means open flywheel type, as in Fig. 30.

A indicates a bearing cup required in crowded housings, as in Fig. 29.

X signifies a two-bearing clutch with the sleeve keyed to shaft, as in Fig. 26.

U indicates the use of self-contained T.O. bearing without a bearing cup and no retractor collar bearing.

Y indicates new sleeve design. **1** indicates special clutch cover.

When letters are **prefixed: S** indicates wide friction-surface parts; **R** indicates wide friction-surface parts, but slightly narrower than those with prefix **S**; **F** indicates heavy-duty truck clutches.

On latest clutches the size or diameter is prefixed in figures, and letter code for size is dropped, as in **13FX.**

Care and Lubrication

If clutch seems to drag and gear shifting is difficult after adjustment instructions have been carried out, there is probably surplus oil in the clutch.

***To correct, wash out or clean clutch** by pouring about one-half pint of kerosene through a funnel or chute into the large opening in the clutch cover while engine is running, and engage and disengage the clutch as it runs. The surplus kerosene can be drained from the clutch by letting the car stand overnight with the front wheels higher than the rear. This permits the liquid to work its way between the friction surfaces readily if the clutch is released and gear in mesh. If the first application is not sufficient, repeat the operation.

Care should be taken to see that the oil level in transmission is not too high—approximately up to the center of the lower shaft.

Lubrication: Oil for sleeve (8) **and bearings** is provided from the transmission through the hollow clutch shaft and holes bored in the sleeve itself. Care should be taken to see that the **oil level in the transmission** is not too high; it should come approximately up to the center of the lower, or secondary, transmission shaft. An **oil of a liquid nature** should be used in the transmission of about the consistency of 600 W.

Over-lubrication will cause clutch plates to slip and also **drag. Under-lubrication will cause clutch sleeve and bearings** to become noisy. The surplus of oil may be removed by washing it out with kerosene, as explained in text above.

After about **every thousand miles,** remove the adjusting bolt and squirt a little cylinder oil into the clutch—**just enough to moisten the asbestos rings.** Too much oil will cause the clutch to slip until the oil is burned out.

If trouble is encountered after these instructions have been carried out, it is an indication that facings require replacement or that some part of the clutch is out of position or incorrectly assembled.

Pointers on Operating Clutch

Do not slip the clutch excessively instead of shifting gears. Slipping it makes the clutch do all the work that the transmission was designed to do.

Do not drive with the foot on the clutch pedal. It puts a constant pressure on the throw-out bearing and shortens its life, and tends to wear clutch facings. Keep the clutch properly adjusted.

Clutch Troubles: Cause; Remedy (Borg & Beck)

Slipping is a bad condition that may ruin facings, drive disk, bearings, sleeve, in fact the whole clutch, if allowed to continue.

It is usually caused by a continual pedal pressure on the under side of the floor-board which holds the clutch partially "out", thus wearing the facings, or it may result from an excess of oil in the clutch, or driving with foot on the clutch pedal.

Remedy: Adjust the clutch by moving the two adjustment bolts, as described on the preceding pages. If slipping comes from too loose an adjustment of the clutch, the same remedy will correct it. If there is too much oil, drain the clutch housing and wash it out with kerosene. If this does not relieve the trouble, the clutch facings (1 and 3) may be worn, or the spring (7) damaged.

Slipping of the clutch, followed by chattering and grabbing: This indicates that the asbestos facings (1 and 3) are glazed and should be replaced, and this necessitates the removal of the clutch.

Dragging, which makes gear-shifting difficult.

Cause: Failure of the clutch to release properly, and so to allow the driven disk (2) and the clutch shaft (S) to come to rest. It may come from: too tight an adjustment of the clutch; failure of the clutch-brake action; accumulation of oil and dirt in the clutch; bent, worn, or incorrectly assembled parts; worn out pilot bearing (10) in flywheel.

Remedy: Adjust correctly; wash off brake facing with gasoline, or renew brake facing; wash out with kerosene; remove clutch and make any necessary repairs; put in new pilot bearing.

Grabbing or stuttering: This condition causes the car to jump and shake as the clutch is let in, and shows uneven gripping of the friction or drive disk by the asbestos friction rings.

Cause: It has been found that this is nearly always caused by imperfect alignment of the clutch in installing.

Remedy: Take the clutch down and secure proper alignment of the clutch shaft. If the grabbing comes from a warped drive disk, caused by overheating from slipping, it will be necessary to replace the drive disk and friction rings.

At times, grabbing may be caused by the accumulation of dirt or foreign matter on the asbestos facings and drive disk.

Remedy: Wash out the clutch by cleaning it with kerosene, as described on this page. Do not fail to oil the clutch after using kerosene, as explained **under** "Lubrication."

*See pp. 1091-1094 for *later* clutches. Oil or kerosene must not be put into these clutches and facings must be kept *dry and free from oil.* These clutches permit full facing wear without any adjustment—only the *clutch pedal* should be adjusted. If clutch *"slips," "chatters"* or *"grabs"* and pedal adjustment does not remedy trouble clutch is disassembled.

If clutch facings (1 and 3) **are worn, trouble will be experienced when shifting gears** into first speed when car is standing.

Remedy: Remove clutch and put in new facings.

Noise may develop at the three points on the thrust ring where it is driven by the dowel pins (**P**) (Fig. 26) in the flywheel.

Cause: The fact that the pins were not properly fitted at the time of installation, and the fact that the backlash causes wear in the slots of thrust ring.

Remedy: Take down the clutch and replace the dowel pins with pins of proper fit for thrust-ring slots.

Improper lubrication will cause the retractor collar bearing or throw-out bearing to become noisy.

Remedy: Open up the oil holes in the clutch shaft, replacing the bearings, if worn.

These bearings may also become noisy if the bearing seat on the clutch sleeve is allowed to get out of line, or if the clutch shaft is out of line.

Cause: This sometimes results from hasty installation or from bad alignment of the throw-out yoke.

Remedy: Straighten the bearings on the sleeve and set the clutch-pedal yoke to bear evenly on the throw-out bearing.

If clutch will not pull when engaged, or drags when disengaged after having correctly made adjustment.

Cause: Clutch shaft, flywheel, or other bearings may be out of line, or drive disk may be in wrong (the clutch shaft may have been sprung when assembling and replacing transmission).

Actual failure of the clutch to operate, or excessive noise when the clutch pedal is pushed out, indicating that the clutch spring or some of the operating members are worn or broken, and necessitating a removal of the clutch.

Ordinarily a washing and adjustment of the clutch will place all parts in good condition. Unless it is positively indicated that a removal is necessary, cleaning and adjustment should always take place before tearing the clutch down.

To Remove Clutch and Disassemble

This is necessitated by worn clutch rings, by actual failure of the clutch to operate, or by continued presence of oil after repeated cleanings.

In order to remove clutch, it is necessary first to remove transmission and disconnect clutch pedal.

1. Punch the remounting "line-up" marks on the cover and flywheel, so that the cover may be replaced exactly as removed. If the cover should be replaced wrong, or shifted in remounting, the clutch will not operate properly.
2. Throw the clutch "out" and lock out the spring, by placing two blocks of wood (space block), as shown in Fig. 25 (see also Fig. 30B) between the cover and the throw-out yoke.

Note: It is best to use two wood blocks as shown in Fig. 25 because one block is liable to slip out when used in (**X**) type clutches and allow bearing to go through hole in cover.

3. Remove clutch-cover bolts and draw out clutch.

Note: If all working members are in good condition and are not worn excessively, new friction rings should be slipped in place and the clutch should be reassembled.

It may, however, be necessary to completely dismantle clutch, in order to replace the spring or some other worn member. The **average tolerance in wear of parts is .016".**

4. To remove spring, the assembly can be placed in an arbor press or drill press, and the pressure of the spring removed from the levers, after which the adjustment screws (**A**) may be removed allowing complete disassembling.

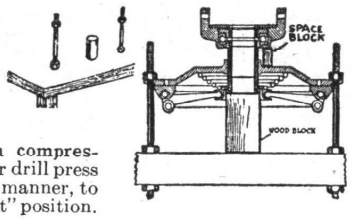


Fig. 30A. Details of **a simple clutch compressor** which can be easily constructed on the bench and used for disassembling and assembling a clutch.

Fig. 30B. **The clutch compressor in use.** An arbor or drill press may be used in a similar manner, to hold the clutch in the "out" position.

To Reassemble Clutch

1. Reassemble clutch, using the compressor shown in Figs 30**A**, 30**B**, or use an arbor, or drill press.
2. Place the space block in position, and remove the clutch from the compressor.
3. Place the friction ring (1), then the clutch-driven plate (2) in the flywheel, followed by the other friction ring (3) and as shown in assembly (Fig. 23, page 846). Then insert the three dowel pins in their holes in the flywheel. Next put in the thrust ring (4) (see note).
4. Then put the clutch assembly in place.
5. Replace the clutch cover bolts, making sure that the cover is in the same position as when removed.
6. Replace the transmission, drive shaft, etc.
7. Check up adjustment of pedals and clutch as outlined, and see that clutch brake is working all right.
8. Grease all parts, and replace all fittings.

Note: The thrust ring, or pressure plate (4) **must slide freely on the three dowel pins** (**P**) **in the flywheel.** Do not file slots if ring sticks. See that pins are turned so that flat sides are parallel with slots in ring.

Line up flywheel bearing and driven plate with clutch shaft before tightening clutch cover cap screws.

Tighten cap screws before pulling out shaft.

Place a small amount of hard oil on sleeve before assembling transmission to engine. **Do not let transmission hang** in clutch assembly.

Inspection and Repair of Clutch Brake

The purpose of the clutch brake is to stop the spinning of the clutch and to prevent gears clashing when shifting. To examine see below:

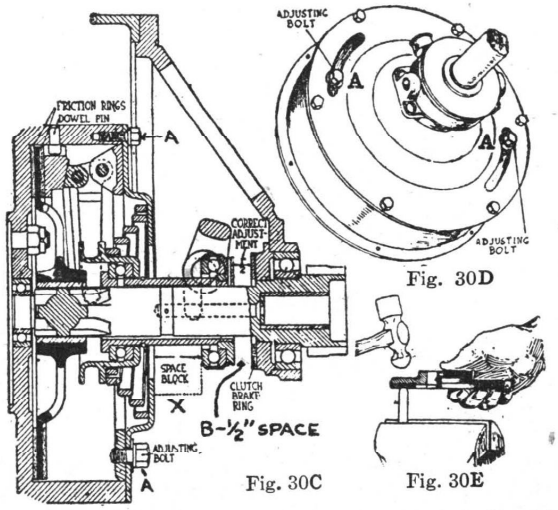


Fig. 30C

Fig. 30D

Fig. 30E

1. Press the clutch pedal down fully. The clutch brake with the "X" type clutches is fastened onto the forward side of transmission and if the clutch has been assembled with the correct length sleeve for the housing on which it is used, the end of the sleeve will come in contact with the brake, if the clutch pedal is set so that it does not strike the floor board when fully depressed.
2. Examine the brake (see Fig. 30C showing the clutch-brake ring), and see whether it actually touches the end of sleeve or not. If it does not touch, it is due to incorrect adjustment of clutch pedal. Adjust clutch pedal as directed above.
3. If the clutch-brake facing is worn very thin or is glazed, it should be removed and a new one should be riveted on in its place. Brass tubular rivets should be used, and should be countersunk well beneath the surface of the facing (see Fig. 30E) (on some transmissions the clutch-brake facing is not riveted, but floats in a flanged ring).

The transmission must be removed in order to remove or replace clutch-brake facing.

One common cause of wear of clutch-brake facing is coasting, as the clutch brake then not only stops clutch parts from spinning, but also acts as a brake through the transmission.

Adjusting Borg & Beck Type "9KP" and "10KP" Clutch

This clutch differs from those shown in Figs. 23 to 30E, in that this clutch is termed a **"push type,"** that is to say, the throw-out bearing (8) is **pushed against the tension of spring (7) in order to release clutch, instead of "pulling."** Also note that the two friction rings are riveted to the friction disk.

To adjust types 9KP proceed as follows:

1. Loosen both adjustment bolts (**A**). As both bolts are screwed into the same ring (5), moving one also moves the other.
2. Throw out clutch by pushing pedal down until pad rests on toe board. (As shown in Fig. 30F, the spring should then be compressed nearly flat against the cover.) Move bolt (**A**) to the right, or clockwise, which tightens the clutch.
3. Let in clutch and measure distance from rear face of release collar (8) to clutch cover (9). This should be 1″, and a gauge made of wire with a 1″ bend at one end may be used to advantage.
4. If this space is more than 1″, throw out clutch and move bolt (**A**) a little more to the right. If less than 1″, move bolt (**A**) to the left. After correct setting has been obtained, tighten both bolts (**A**). This completes clutch adjustment.
5. The clearance (**E**) between the clutch pedal (when clutch is "in"; now shown "out") and under side of toe-board (**E1**) should now be 1″ or more. If less than 1″, the clutch pedal adjustment (**G**) should be changed, shifting the pedal down until that clearance is obtained. Now let clutch "in" by pressing the pedal down (position shown in illustration) and note distance the release collar (8) travels. It should be pushed toward the flywheel about ¼″, which is necessary for a clean release. If it does not travel that distance, shift pedal up a notch so as to allow little more travel.
6. The clutch pedal adjustment has now been set in its correct position and should not be touched again, because adjusting the clutch automatically returns pedal to its correct position and restores clearance under the toe-board.

Fig. 30F

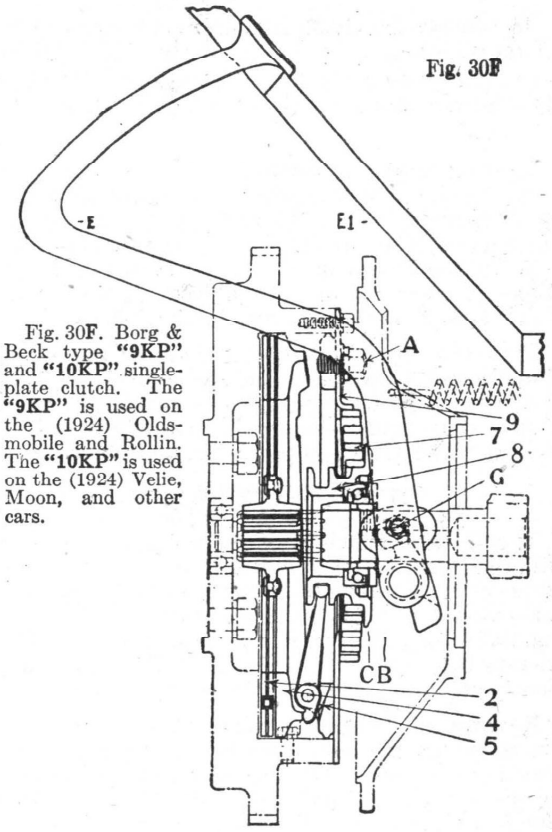


Fig. 30F. Borg & Beck type **"9KP"** and **"10KP"** single-plate clutch. The **"9KP"** is used on the (1924) Oldsmobile and Rollin. The **"10KP"** is used on the (1924) Velie, Moon, and other cars.

If the clutch is to be removed from the flywheel, first punch remounting line-up marks on cover and flywheel, as clutch will not operate if cover is shifted in mounting.

Before the holding screws are removed, be sure that the two adjustment screws (**A**) are in place and securely tightened. Then, after all the holding screws have been relieved about ½″, the levers will strike the cover (9) and retain collar (8) and spring (7) in place. **To remove spring,** the assembly can be placed in an arbor or drill press and the pressure of the spring removed from the levers, after which the adjustment screws (**A**) may be removed, allowing complete disassembling.

When placing driven plate in flywheel, be sure that the **flange end** of hub is toward the outside.

To adjust type 10KP clutch, follow the foregoing instructions, except that the dimensions differ as follows: Distance in items 3 and 4 should be 1 3/16″ instead of 1″.

ADJUSTMENT OF A MULTIPLE-DISK CORK-INSERT LUBRICATED TYPE OF CLUTCH

This clutch, as an example, is made with seven driving and seven driven members. They are provided with cork inserts and run in oil.

New corks may be inserted in the disks by the use of a special tool after the corks have been soaked in warm water to make them pliable. They are trimmed off so as to leave a projection of about 1/32′ on each side, and then they are ground to an even surface on the disk grinder.

A more convenient method for the average repairman is to use fine sandpaper. The disks should be trued by rubbing them on a flat surface which has a very thick coating of prussian blue or lamp black. The cork inserts should not project too far over the disk or the clutch will drag; 1/32″ is the maximum.

The clutch spring (S) (Fig. 31) is not adjustable; a new and stronger spring is installed if greater tension is required. The position of pedal will shift toward floorboard after clutch has been in service a short time, because inserts, when brought under pressure of clutch spring, will compress slightly.

If the pedal is not adjusted, it will cause a continuous pressure against the clutch and eventually produce slipping. There should be ¾″ clearance between the clutch pedal and the upper side of the floorboard. This is adjusted by loosening the lock nut at the end of the turnbuckle.

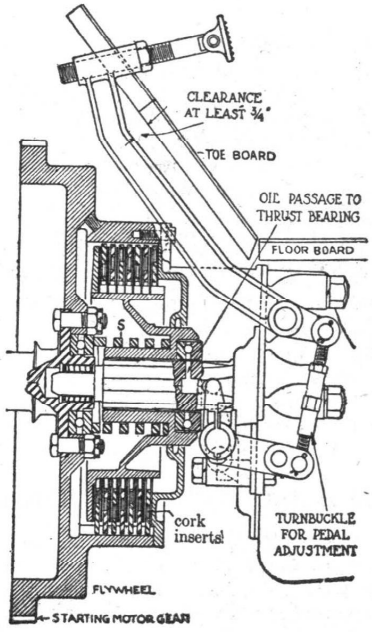


Fig. 31. Sectional view of a multiple-disk cork-insert lubricated type of clutch. Note adjustable foot-pedal.