REFER TO THIS LETTER BY NUMBER

TO BE NOTED AND INITIALED BY	

PACKARD MOTOR CAR COMPANY

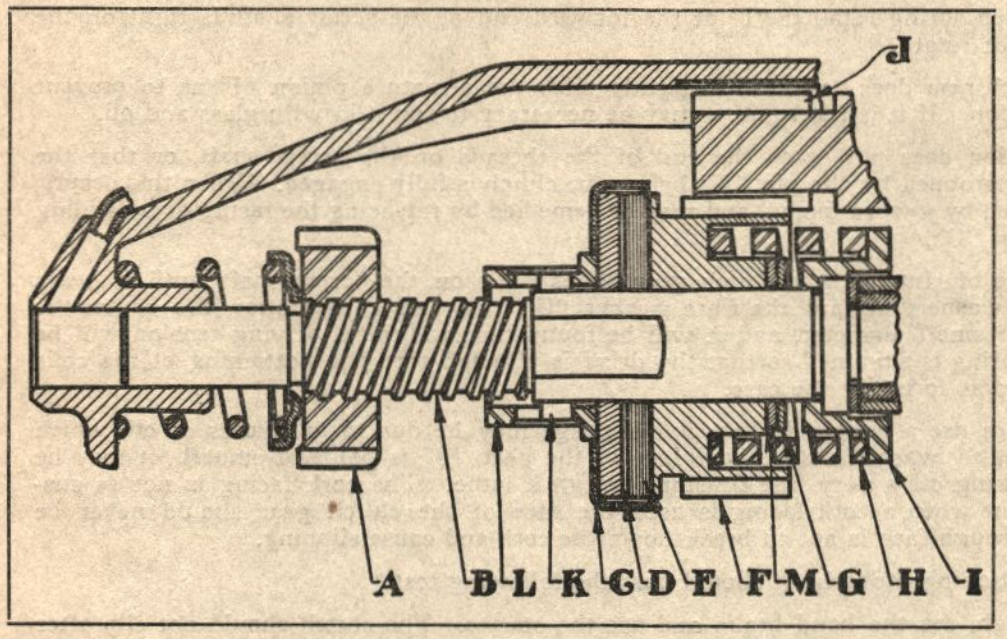
DETROIT MICHIGAN

April 23, 1921

Reprinted June 27, 1922

To Packard Distributers.

Subject, Twin-Six Motor Starter Clutch



If a Twin-Six starter motor revolves without turning over the engine, the difficulty is due to the fact that the starter motor clutch is not functioning properly, and the difficulty should be remedied without delay. Continued slippage is almost sure to burn out the clutch facing.

Slipping clutches in general may be divided into two classes:

1—Clutches which slip before the engagement of the pinion with the fly wheel. When this occurs, the starter motor revolves at a comparatively high speed.

2—Clutches which slip after the teeth engage. These may be distinguished by the much slower rotating speed of the motor. This is the condition usually found.

Considering clutches which slip before engagement, you will find it necessary to check the following conditions:

1—The teeth of the pinion "A" may mesh too tightly with the fly wheel, which will prevent the pinion from traveling freely along the screw shaft "B". This may be due to some variation in the housing, and may be checked by the substitution of another housing. It will very seldom be encountered.

2—The screw shaft "B" may bind in its bearings. If it does not turn freely, it should be disassembled and the bearings should be line reamed and thoroughly lubricated before the shaft is replaced.

3—See that the punched steel plate "D" which carries the clutch facing "E" is not slipping inside of the driven member "C." This plate is used only with clutches employing the cork facing. In some cases it may be found that the small projections on the punched plate have not been engaging with the holes in the driven member, so as to prevent movement between the two. These two pieces are being riveted together in current production.

4—The initial clutch tension may be insufficient to rotate the screw shaft and start the movement of the pinion along the shaft. The proper tension is 4 ft. pounds minimum up to 12 ft. pounds maximum, or a pull of 4 pounds on a lever arm 12" long, which may most easily be checked by fastening the screw shaft securely in a vice and engaging a hook spanner wrench or some similar tool with the teeth of the clutch gear "F" and exerting the pull with a spring scale at the proper distance from the center of the shaft. The spanner wrench in the Twin-Six tool equipment, Piece No. 55763, may be used for this purpose, altho in this case the lever arm will be only 9", so that a pull of over 5 pounds minimum will be necessary. If the tension is too low, it may be necessary to:

(a) Replace a badly worn or glazed facing.

(b) Add washers back of the clutch spring to increase the initial tension, or replace the spring.

When the slipping of the clutch is accompanied by such a slow motor speed as to indicate that the slippage is occurring after the engagement of the teeth, a temporary relief may sometimes be found by letting up on the starter button and trying again until the clutch takes hold. It should be remedied as soon as possible as continued slippage will surely result in injury to the facing. When the clutch slips after engagement, the condition is always aggravated by a cold or stiff motor.

1—See that the clutch gear "F" is free to slide on the shaft. If it cannot slide, the pinion will be unable to force the gear back and compress the spring so as to get the necessary clutch action in starting.

2—See that the clutch spring retainer "I" at the forward end of the screw shaft is tight on the shaft and does not rotate.

3—See that the clutch gear does not mesh so tightly with the armature pinion "J" as to prevent a free sliding action. If it is too tight, it may be necessary to run it in with glass and oil.

4—See that the pinion does not reach the end of the threads on the screw shaft, or that the collar "L" is not stopped by the pin "K" before the clutch is fully engaged. When this occurs, it is usually caused by a worn facing, and may be remedied by replacing the facing or by adding another washer at "G".

5—On the later type of clutches, the clutch gear slides back on the screw shaft until it bears against the steel washer "M" and the fibre washer "G". In this construction the contact is made on a rather small diameter, and it will be found that additional driving tension will be obtained if the spring is shimmed so that the drive is effected thru the bottoming of the coils of the spring as was formerly the case.

6—The early clutches use a leather facing, and slippage may be due to an excess of oil, which should be thoroughly washed out. If the face of the gear "F" is polished smooth, it may be roughened by taking off a very fine finishing cut in a lathe. The cork facing is not as susceptible to oil, but when a cork facing is used the face of the clutch gear should never be roughened, as a rough face is apt to break down the cork and cause slipping.

If the clutch is functioning properly, it should pass the following test:

Put the gears in high, set the hand brake and use the starter. The clutch should not slip after the first contact. If it does, it should be taken down and the conditions checked which we have outlined above. This test causes a heavy drain on the battery, and should not be continued for more than a few seconds.

Yours very truly,

PACKARD MOTOR CAR COMPANY.

H. N. Davock.

H. N. DAVOCK, Manager,
Technical Service Department.