

GEARS OFTEN CAUSE MUCH OF TROUBLE

Parts Wobble Out of True and Loud Noises Result.

REPLACEMENT IS NEEDED

Housing Must Be Opened and Loose Gear Located Before Howl or Hum Can Be Stopped.

Gear noises are objectionable for two reasons—they are not very pleasant and they indicate abnormal operation of the gears, which may quickly lead to expensive trouble. Transmission or axle gears, though mounted in a housing, even when in good condition will emit a slight hum, for it is almost impossible to operate two enmeshed gears without there being some slight noise. The noises that gears make when they are not operating properly are at once detected by the driver of the car because there usually is a severe stress in the sound, a loud howl or some noise which is quite different in character from that given off by two properly fitted gears.

So far as the engine is concerned the front end or timing gears usually run quietly for long periods, but when wear sets in, when bearings wear endwise and force the gears out of proper mesh, or when chips of foreign matter get between the gears there is an immediate increase in noise until it becomes a nuisance.

Much of the engine noise is due to these timing gears, the tappets being secondary. The unfortunate thing is that when the timing gears do become noisy one cannot come upon the cause of the trouble without examining the gears. They are noisy, the driver says, and the only way really to find out why is to take off the timing case cover, look at the gears, feel for backlash and end play, and then either put in a whole set or a non-metal gear. It is possible often to get a quiet front end by substituting a fiber or other non-metal gear for a metal one. Where all metal gears are demanded it is necessary to match the gears. Usually one new metal gear in the train will be noisy.

Gears Must Be True.

For some reason or other an average driver will put up with a noisy set of timing gears, whereas he demands quiet in the transmission and rear axle. There is a sound reason for this also, because the gear set and axle gears do more work under more severe conditions. All gears, whether in the transmission engine or axle, are designed to operate in line; the teeth must fit in one way only, and not deviate much from that setting. They must run always in a bath of oil. Should one gear run out of true, that is, wobble even the slightest bit, the tooth pressure will be greater and there will be more noise. The intermittent howl you hear from an axle or transmission is due to the alteration of this stress. One second it is relieved; the next it is severe again. Every time the gear wobbles you might say there is a pinching of teeth—they press too much against each other.

In the transmission there are two or three or more shafts mounted in bearings in the housings. These shafts carry gears, some of which slide on a shaft. When the transmission is new these shafts and gears are so fitted that the gears will run in one true circle all the time. Any change in the position of the shaft or any change in the gear teeth will upset the true running of the gear, and the result will be more noise.

On all speeds but high you hear more noise as a result of the higher tooth pressure; but that noise or hum is well fitted and well mounted shafts is a steady noise for any given speed. In abnormal operation there may be a rattling sound as though something was loose in the transmission and the sound instead of being a steady hum is a series of howls varying with intensity while the car moves along at the same speed. These noises may be caused by lack of proper lubrication, badly worn teeth, gears shifting slightly out of true positions (caused over a trifle), high spots on the gears caused by a soft tooth which has worn down quickly, or by foreign matter getting between the teeth, worn shaft bearings, bent shafts, chipped gear teeth.

Attention Saves Trouble.

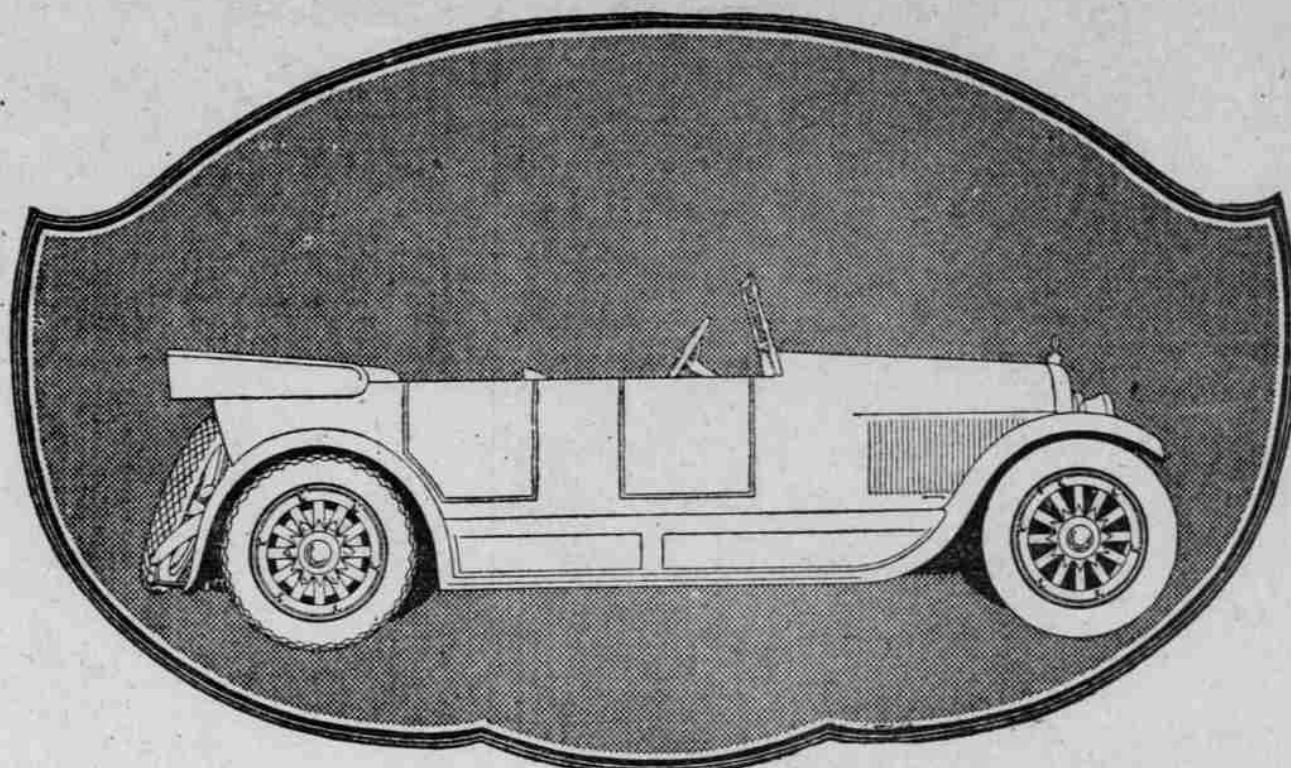
A transmission may operate for thousands of miles with any of these troubles, but it always is cheaper to attend to any serious matter at the beginning. For example, shaft bearings when worn badly allow the whole shaft to sway, throwing all the gears on that and the adjacent shafts out of the proper mesh. The result is that the gears wear unevenly. The condition existing for some time may call for practically a new transmission. Especially where bearings are adjusted should advantage be taken of the feature and the shafts be kept in proper alignment.

Rear axles of today are none too good as a whole, but they would give far better and longer service if the driving were properly done. Quick engagement of the clutch, heavy overloads, even though for an instant, harsh application of brakes on rough roads, lack of lubrication are some of the causes of worn pinions and differential bearings and worn gears. The average car has an adjustable driving pinion and differential unit. When new these bevel gears operate so that the gears mesh in one certain way. If a bearing wears and allows the pinion to change its mesh, or if the differential bearings wear and allow the whole unit to shift over away from or toward the pinion, there is bound to be noise produced and noise or an unpleasant character. The bearings, if they are of the ball type with ball separators or cages, may show a breaking down of the cage. Pieces of the cage fall between the gear teeth, chipping them and causing more noise. The bearings themselves then allow more freedom of movement of the differential or pinion. It is absolutely necessary that the two gears retain a fixed position, and as soon as there is an unusual gear noise from the axle, it is a warning that the gears are not running so or that there is solid matter between the teeth.

Where the pinion is keyed to the end of the propeller shaft there often is wear in the key and keyway. This will allow the pinion rotational freedom and will be heard in the form of a loud click on starting the car or stopping. Usually when pulling this play will not be heard.

Lacquering Brass.

It is possible to protect metal surfaces by applying several coats of lacquer or celluloid varnish. The lacquer should be applied with a camel's hair brush after the metal has been polished highly. There must be no trace of grease on the brass or other metal when it is lacquered.



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