

A REVIEW ON BENDIX DRIVE IN AUTOMOBILES

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ABSTRACT

In these review paper we are going to do research study of Bendix Drive Mechanism. We will explore various pattern of Bendix drive Mechanism. This study examines importance of Bendix drive Mechanism in Automobile system .we will also study various components of bendix drive . Bendix drive plays a vital role in engagement of automobile vehicles.

Keywords: Analysis, investigation, research, Bendix Drive, Automobile.

I. INTRODUCTION

One of popular starting Mechanism is Bendix drive .Throughout the history of motor vehicles Bendix drive has helped in starting I. c .engines. Vincent Hugo Bendix was the American industrialist and inventor who invented Bendix drive Mechanism. Chevrolet "Baby Grand"Was the first the first automobile to use Bendix starter Drive in 1914. It became standard in all cars produced U. S. A. In 1929. Bendix drive mechanism has several types .This mechanism is built in very skillfull way . It mechanism is Such that while engagement of vehicle to protect the starter motor it brings disengagement also. Thus the life of starter motor is not affected.

II. METHODOLOGY

Definition :

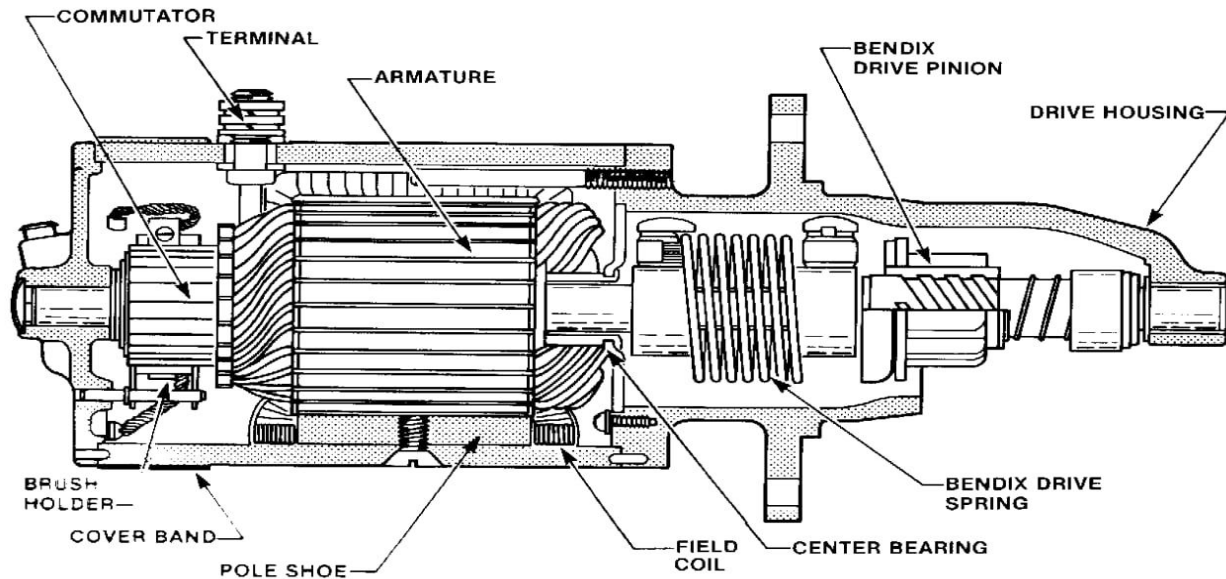


Bendix Drive Mechanism is one of the engagement mechanism used in starter motor of IC engines . It is a type of drive which is used to transfer rotation of starter motor to flywheel. It is generally an assembly of pinion drive gear on a splined shaft and mounted on the shaft of the starter motor. There are two types of design inboard and outboard . Generally in outboard type of Bendix drive the pinion moves away from the starting motor to engage flywheels and in case of inboard type Bendix drive pinion move towards the starting motor. Inboard Bendix drive are commonly used whereas outboard are used less as it experiences bending stress as the shaft is longer compared to inboard and length make it less rigid due to high bending stress it experiences.

Bendix drive function :

Firstly, to start an I. C. Engine there is need of starter motor .The required forces are generated by starter motor but the motor cannot achieve it requires a helping mechanisms. This helping mechanism is Bendix drive mechanism . This mechanism help to transfer motor's rotation to the flywheel though it cranking up the engine. The engine get started the Bendix drive disengages the pinion gear with from its mesh with the flywheel .It ensures the engine rotation does not end up driving the starter motor and damages it. For electric transfer

system Bendix drive performs function as , It transfers the turning force of starter motor to engine to help the produce the compression cycles.



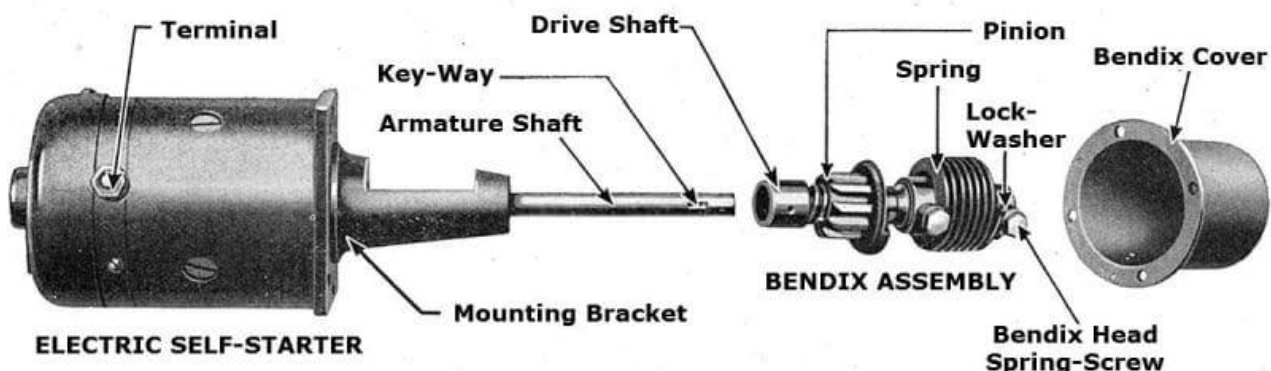
Bendix drive principle:

Inertial pinion Bendix drive : This process can be subdivided into two phases engagement and disengagement.

Engagement : Firstly, we have turn the ignition switch powers up the starter motor .The armature winding of an electric machine which carries alternating current. which causes Bendix drive shaft also to rotate . The weighted pinion gear does not along with does not rotate immediately . It is loosely attached to the shaft . When the pinion move on the threaded shaft spring heavy duty which is connected to motor shaft also winds up when the pinion is reached to the end of it’s travel it gets encountered with a restraining collar . This collar functioning in preventing in the gear from moving further which locks the shaft which ultimately results in starter motor rotating the pinion gear. Now, pinion gets mesh in with the flywheel’s ring gear. Which causes the flywheel to rotate and start the engine. On the drive head there is heavy spring which helps to absorb the shock of engagement.

Disengagement : As the engine starts, the pinion gear and flywheel cannot stay in mesh. As it may damage the starter motor. The pinion gear is thrown out of the engagement. The springs of Bendix drive large and main helps to cushion the pinion in motion mesh to return to its original position.. It is also very important that pinion gear to disengage from flywheel when the engine get started.

Bendix drive parts and functions:



The whole working operating of Bendix drive depends upon it’s individual parts.

Main spring

It is a helical spring on the drive's shaft. When the starter motor powers and pinion gear which engages to flywheel the spring also winds. It cushions the gear from impact mechanical with engagement and it generally allows pinion gear to get reach ring gear of flywheel.

Drive Shaft

It is the part that holds pinion gear.

Drive pinion gear

On the drive shaft it is a small gear. Generally it's function is to transmit motor rotation to flywheel and start the engine.

Friction clutch

It is positioned between the motor and drive's shaft. It also connects the Bendix assembly when it moves to rotate flywheel and it disengages when the engine get started.

III. MODELING AND ANALYSIS

Bendix Drive Analysis



Sometimes the individual parts of the drive experience violent movements which causes rapid wear and May damage the parts.

Damaged small component if any of the part gets damaged it overall results in failing drive's operation. **Threads dirt.** When the threads accumulate dirt and dust the improper movement is observed or it may even restrict. **Weak springs** we know the springs helps to thrust back the pinion gear. If the helical spring is broken or become weak improper functioning is observed the vehicle may not start. **Broken pinion teeth** if there is rough engagement of flywheel and pinion it disturbing effects are obtained. Modelling and analysis of Bendix drive must be carefully done as it is very important and delicate part hence both modelling and analysis may effect whole engagement and disengagement of vehicle.

IV. RESULTS AND DISCUSSION

The Bendix drive is located at front part of motor which is attached to motor's shaft from one end. It's location allows for better disengagement and engagement. If the engine Is failing to not starting, cranking, grinding noise we should check Bendix drive the reason might also be damaged starter motor, battery problems. The idea of lubrication the Bendix drive shaft with engine oil is not advisable In case of inertial pinion type. We have observed that parts of Bendix drive must be in good conditioned or else it will fail in its functioning. Once the

lifespan of Bendix drive is over it is advisable to replace the whole component. The general price depends upon type of brand and material using.

V. CONCLUSION

We have concluded that Bendix drive mechanism of automobile is a small device which performs very useful functions in aspect of buying the component performance factor should be taken into consideration .We have known the importance of Bendix drive in Automobile Vehicle. We have observed and studied various factors due to which engagement of vehicle fails and remedies are also mentioned.

ACKNOWLEDGEMENTS

We acknowledge professor P. V. Chahare who guided us in research work .

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