TECHNI/TIPS

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TORQUE CONVERTERS

A major component in the power train of a vehicle, the torque converter, is a fluid coupling which separates the engine from the train so that all drive line power is transmitted via fluid. Its purpose is to extend the versatility of a vehicle and to assure continuous performance at optimum speed.

It is essential to understand that the torque converter does not increase horsepower - it increase available torque. Productivity is achieved by matching the torque converter to the engine application, so an appropriate amount of horsepower will handle a given job in the most efficient manner possible.

The basic parts of a torque converter include the impeller or driving pump; the turbine, which is driven by the impeller; and the stator, which directs fluid to take maximum advantage of avail-able power. Successful performance of these supporting parts is important to the major function of a torque converter.

The charge pump, powered by the engine, provides a continuously moving and changing sup-ply of filtered hydraulic oil. Fluid is moved from the transmission sump to the regulating valve and then to the impeller. Impeller fins eject the fluid at high velocity, rotating the turbine. The stator redirects fluid from the turbine back to the impeller, further increasing torque output.

A properly used and serviced torque converter will rarely cause operational problems. So, it is wise to check other possible sources before tackling the converter, should a problem arise. If an owner/operator follows recommendations and service instructions detailed in the OEM's operators' manual, life of the torque converter can be extended.

Operating within the specified temperature range is most important, since overheating quickly degrades the oil, and consequently the converter performance. Excessive temperature readings indicate improper operations techniques or a mechanical problem in the system. Periodic filter changes also are required.

LE's 7500 MONOLEC Power Fluid is a highly versatile fluid for torque converters. It is blended from the finest high Viscosity Index, thermally stable base oils and carefully selected additives give extra lubricity for very heavy duty service and help eliminate power fade and chatter.

Like any other mechanical device, torque converters eventually require an overhaul, depending on the integrity of the supporting sytems, how clean the fluid is kept, and the amount of abuse to which is subjected. Shutdown for service may be controlled by routine monitoring.

When servicing, simple checks should include the oil supply and pressure, cooling system efficiency (coolant level, air flow, etc.), cleanliness of the oil, condition of screens, filters, supply lines, fittings, flanges and drive lines.

A torque converter generally is used to provide input for a powershift transmission, although a geared transmission or a power-and-gear combination sometimes is connected to it. The number of gears (ranges) depends on the application, since a vehicle moving a comparatively greater distance needs a wider selection to gain maximum productivity.

A single-phase, single-stage torque converter, in which the stator is a stationary component is ruggedly built for heavy duty, highly efficient construction work. Additional advantages are ease of service and repair.

Vehicles which must operate efficiently and economically at comparatively high speeds take advantage of a free-wheeling stator in the torque converter. The stator is held in place to multiply torque as needed in low gear, then when turbine speed matches impeller speed, it is allowed to rotate with the turbine and impeller like a fluid coupling.

Maximum longevity of the torque converter can be obtained by using the type of filters recommended, changing them as specified, and accelerating the change schedule when encountering extreme working conditions. It is important that the torque converter not be abused during operation. Working speeds should be selected to provide the minimum of torque conversion. A good practice is to schedule appropriate maintenance, and take advantage of an oil monitoring program along with using the very best fluid available for such service, such as LE's 7500 MONOLEC Power Fluid.

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