2008 Cadillac XLR-V: Service Information: Hydra-Matic 6L80 Six-Speed Automatic Car and Truck Transmission

2008 Hydra-Matic 6L80 (MYC)

2008 Model Year Summary
Hydra-Matic 6L80 six-speed automatic Car & Truck transmission

- New application: Hummer H2, SUT
- Modular design for application flexibility

Full descriptions of new or changed features

NEW APPLICATIONS:
The Hydra-Matic 6L80 six-speed automatic transmission is mated to the Vortec 6.2L V8 (L92) engine in the 2008 model year Hummer H2 and SUT. This new application is equipped with a transmission-mounted transfer case to direct power to both rear and front axles.

Modular Design for Application Flexibility

Because of the modular design of the Hydra-Matic 6L80 six-speed automatic transmission, there are three different bell housings and four different extensions that adapt the transmission to the rear-mounted Corvette and XLR applications, and to the front-mounted car and truck applications that can be configured with rear- and four-wheel-drive. The unique compound gearset in combination with a conventional simple gearset on the output carrier of the transmission allows both the durability necessary for the torque output of the V8 truck engines, as well as a flexible selection of gear ratios with a wide ratio spread.

Overview

The Hydra-Matic 6L80 is a six-speed automatic transmission for rear-drive cars, designed with modular flexibility and compatibility with advanced electronic controls. It was introduced for the 2006 Model Year Cadillac STS-V high-performance rear-drive sedan, and the XLR-V and Chevrolet Corvette two-seat sport coupes and convertibles.

For the 2007 model year, the Hydra-Matic 6L80 was added to the new Cadillac and GMC full-size SUVs and GMC Sierra Denali Pickup. The aluminum case for all these applications is identical; however, the bell housing for each application is unique because of the engine & driveline interfaces.

All applications feature adaptive shift controls. Several additional features such as grade braking, Performance Algorithm Shifting, and Driver Shift Control are available on some of the applications.

Performance Algorithm Shifting (PAS) detects when the vehicles are being driven in a spirited fashion and remains in its current gear ratio even when the driver lifts a foot off the accelerator pedal. PAS monitors how assertively the driver is using engine output to determine at what engine speed to upshift or downshift.

Driver Shift Control, available in the Corvette, STS, and XLR allows the driver to shift the transmission like a clutchless manual gearbox. Electronic safeguards prevent over-revving should the wrong gear position be accidentally selected.

A wide overall ratio spread of 6.04:1 allows a "steep" first gear, as well as very "tall" overdrive top gear for low-rpm highway cruising. Acceleration is maximized, as is fuel economy. Engine noise is also lower during cruising. Both fifth and sixth gears are "overdrive" gears, for example.

Gear changes from second to sixth gears are accomplished with clutch-to-

clutch control, where an oncoming clutch is engaged and an "offgoing" clutch is released in a precise manner to achieve the ratio change. The first-to-second upshift, however, is a freewheeling action, where the second gear clutch engages while the first gear one-way clutch spins freely. This allows a greater degree of smoothness at lower vehicle speeds. The clutch-to-clutch shifting and single freewheeler allows significant reductions in packaging requirements and, as a result, the new six-speed is nearly identical in size to the four-speed transmission it replaces.

Advances in transmission control modules allow the modules to exist reliably inside the transmission, where temperatures remain fairly constant compared to a body-mounted module. The transmission and module are assembled together, so no additional steps are necessary during vehicle assembly.

The 32-bit transmission control module (TCM) monitors transmission performance and compensates for normal wear in components such as clutch plates, so transmission performance remains consistent for the life of the transmission. The control module also "tests" the components of the transmission following assembly to optimize the interaction of the components. The module is compatible with future global applications.

DEXRON® VI premium fluid validated to improve durability and shift stability

A new transmission fluid, DEXRON® VI, was developed to have a more consistent viscosity profile; a more consistent shift performance in extreme conditions; and less degradation over time. Internal GM tests have demonstrated DEXRON® VI delivers more than twice the durability and stability in friction tests compared to existing fluids. The DEXRON® VI fluid was designed specifically and validated for the new family of GM six-speed automatic transmissions.

While the basic aluminum housing for 6L80 transmissions can remain identical for a wide variety of applications, including front- and rear-

mounting, car and truck applications, and rear- or four-wheel-drive applications, the case extensions and bell housings can be modified for nearly any longitudinal drivetrain vehicle. The modular concept of the new Hydra-Matic 6L80 six-speed automatic centers on the desire for common components and manufacturing tooling for four different size variants of the new 6-speed family. The main case uses three main components, and those components are the same for all variants of the transmission. For the first applications of the new transmission, the 6L80-E contains three gearsets, a conventional input planetary gearset with four pinion gears. There is one compound output gearset and one simple output gearset. The compound output gearset uses three sets of pinion gear pairs, with one set of pinions meshing with the sun gear and the other set with the ring gear. This arrangement allows for optimal ratio steps with a 6.04 overall ratio spread.

There are two torque converter sizes, 258mm and 300mm. The 258mm applications use a twin-plate torque converter lockup clutch, while the 300mm applications use a single-plate torque converter lock-up clutch. Both types of clutches make use of GM's proprietary electronic controlled capacity clutch (ECCC) technology, which uses a small, regulated amount of slip to dampen out engine pulses. This creates a smoother running drivetrain, especially during shift events.

For the Hummer H2 and SUT, the 6L80 is mated to the BorgWarner 4484 transfer case, which was developed with GM Powertrain for the extreme capability requirements of the Hummer H2. This transfer case features a full time, lockable planetary differential, with low range. Traction control and wheel slip monitoring are performed by the stability and anti-lock braking systems.

Low maintenance

For severe use, DEXRON® VI fluid changes are the only maintenance recommended. For normal use there is no fluid change scheduled.

The Hydra-Matic 6L80 is produced in Ypsilanti, Michigan.

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