

EMERGENCY VEHICLE SERIES

3000/4000

OPERATOR'S MANUAL



EMERGENCY VEHICLE SERIES



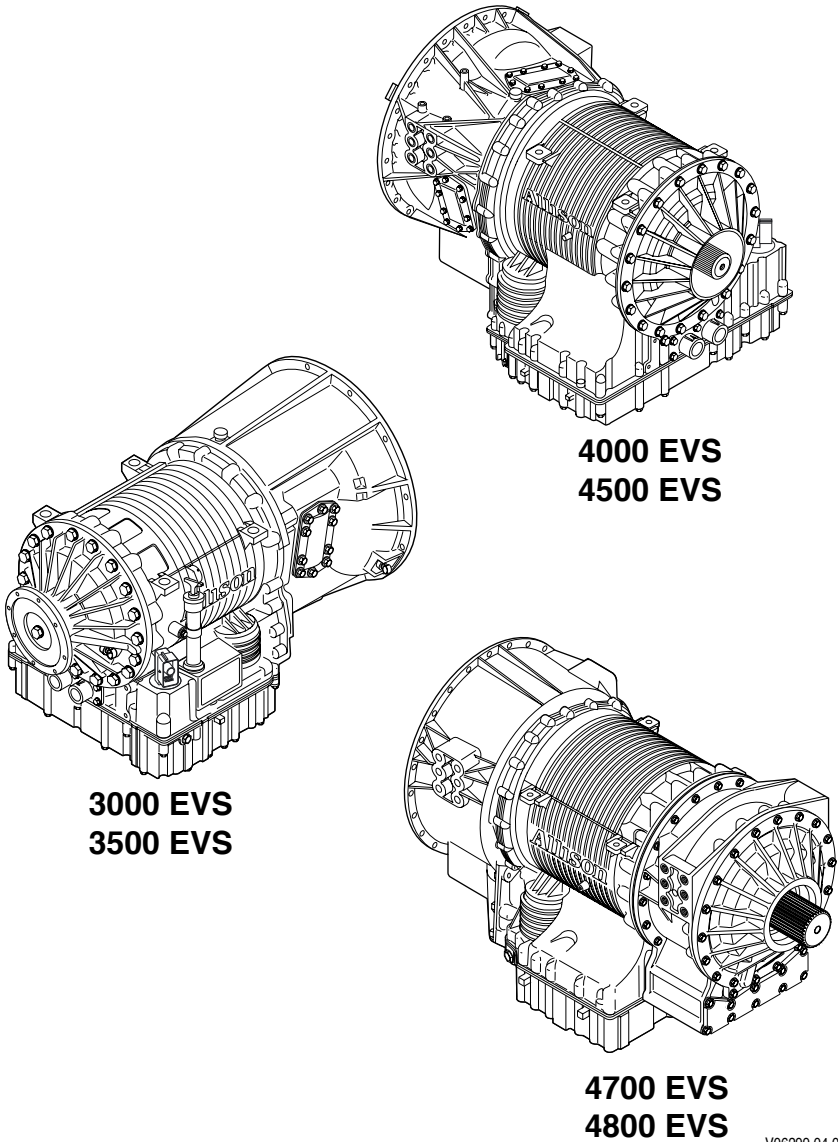
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**Figure 2. Emergency Vehicle Series Transmissions
(Allison 4th Generation Controls)**

RETARDER

The self-contained retarder is at the output of the transmission and consists of a vaned rotor which rotates in a vaned cavity. The rotor is splined to and driven by the output shaft. An external accumulator holds transmission fluid until the retarder is activated. When the retarder is activated, the fluid in the accumulator is pressurized by the vehicle air system and directed into the retarder cavity. The interaction of the fluid with the rotating and stationary vanes causes the retarder rotor and output shaft to reduce speed, slowing the vehicle or limiting speed on a downhill grade. Refer to USING THE HYDRAULIC RETARDER for additional information.

When the retarder is deactivated, the retarder cavity is evacuated and the accumulator is recharged with fluid.

PUSHBUTTON AND LEVER SHIFT SELECTORS WITH DIGITAL DISPLAY *(cont'd)*

Description of Available Ranges (refer to Figure 11 and Figure 12)	
7+ 6* 5* 4* 3 2	Lower ranges provide greater engine braking for going down grades (the lower the range, the greater the braking effect). Occasionally, it may be desirable to restrict automatic shifting to a lower range because of: • Road conditions. • Load. • Traffic conditions. • Etc. The pushbutton shift selector arrow buttons access individual forward ranges. Push the ↑ (Up) or ↓ (Down) arrow for the desired range. The digital display shows the range chosen. Even though a lower range is selected, the transmission may not downshift until vehicle speed is reduced (this prevents excessive engine speed in the lower range).
1	First-range provides the vehicle with its maximum driving torque and engine braking effect. Use first-range when: • Pulling through mud and deep snow. • Maneuvering in tight spaces. • Driving up or down steep grades. For vehicles equipped with the pushbutton selector, push the ↓ (Down) arrow until first-range appears in the select window.
+ Only available in 4700/4800 EVS. * Actual ranges available depend on programming by vehicle manufacturer.	

Types of Retarder Control (cont'd)

Type	Description	Amount of Application
Combinations of the above systems **	Auto “half-on” plus pressure switch *	Half capacity at closed throttle or “Full On” with brake pressure
	Auto “ $\frac{1}{3}$ on” plus two pressure switches *	$\frac{1}{3}$, capacity at closed throttle or $\frac{2}{3}$ and “Full On” with brake pressure
	Hand lever plus pressure switch *	6 levels of modulation with lever, or “Full On” with brake pressure
	Foot pedal plus pressure switch	Full modulation with separate pedal, or “Full On” with brake pressure
	Hand lever plus interface for special pedal *	6 levels of modulation with lever, or 3 levels of modulation based on pedal position
* These control systems may apply the retarder at high speed on grades when the vehicle has road speed limiting and the retarder is enabled. ** For retarder apply systems integrated with the service brake system, the retarder is most effective when applied with light brake pedal pressure for 1–2 seconds to allow the retarder to fully charge. Added pedal pressure can be applied when more aggressive braking is desired.		



NOTE: When the transmission fluid or engine water temperature (engine water is an OEM option) exceeds programmed limits, retarder capacity is automatically gradually reduced to minimize or avoid possible system overheating.

Contact your vehicle manufacturer to understand how the retarder controls have been integrated into your vehicle.



CAUTION: Observe the following cautions when driving a vehicle equipped with a retarder:

- THE RETARDER WORKS ONLY WHEN THE ENGINE IS AT CLOSED THROTTLE.
- OBSERVE TRANSMISSION AND ENGINE TEMPERATURE LIMITS AT ALL TIMES. Select the lowest possible transmission range to increase the cooling system capacity and total retardation available.
- In the event of OVERHEATING, DECREASE THE USE OF THE RETARDER; USE THE SERVICE BRAKES TO SLOW THE VEHICLE.
- OBSERVE THE RETARDER/SUMP “OVERTEMP” LIGHT to be sure it responds properly to retarder temperature.

IMPORTANCE OF PROPER FLUID LEVEL

It is important that the proper fluid level be maintained at all times because the transmission fluid cools, lubricates, and transmits hydraulic power. If the fluid level is too low, the converter and clutches do not receive an adequate supply of fluid. If fluid level is too high, the fluid can aerate. Aerated fluid can cause the transmission to shift erratically or overheat.

Emergency Vehicle Series transmissions have an oil level sensor (OLS) that allows the operator to obtain an indication of fluid level from the shift selector. However, no oil level sensor diagnostics take place unless the OLS is “autodetected” by Allison 4th Generation Controls or WTEC III Controls.

Frequently check for the presence of oil level diagnostics if the transmission is known to contain an OLS. If an OLS is not detected during a fixed number of engine starts, the WTEC III or Allison 4th Generation Controls system concludes that no OLS is present. If an OLS is known to be present, but has not been detected, then troubleshooting of the OLS circuit is required. After the OLS circuit is repaired, reset “autodetect” or manually select the OLS function using Allison DOC™ For PC–Service Tool. For detailed troubleshooting procedures refer to the Troubleshooting Manual. Refer to the SERVICE LITERATURE section for specific publication numbers.



NOTE: To correctly check the transmission fluid level using the dipstick, the transmission fluid must be at operating temperature.

The oil level sensor method of checking the fluid level compensates for transmission fluid temperature between 60°C–104°C (140°F–220°F). Any temperature below 60°C (140°F) or above 104°C (220°F) will result in an **Invalid for Display** condition.

FLUID LEVEL CHECK USING PUSHBUTTON OR LEVER SHIFT SELECTOR

The transmission must be equipped with the oil level sensor to be able to read fluid level information.



NOTE: WTEC III Controls pushbutton and lever selectors display fluid level diagnostic information one character at a time. Allison 4th Generation Controls pushbutton and lever selectors display fluid level diagnostic information two characters at a time.

1. Park the vehicle on a level surface, shift to **N** (Neutral), and apply the parking brake.

FLUID AND INTERNAL FILTER CHANGE INTERVAL RECOMMENDATIONS



CAUTION: Transmission fluid and filter change frequency is determined by the severity of transmission service. To help avoid transmission damage, more frequent changes can be necessary than recommended in the general guidelines when operating conditions create high levels of contamination or overheating.

Allison requires all 3000 and 4000 Product Families transmissions to have the main filter (not the lube filter or fluid) changed after the first 5000 mile (8000 km) or 200 hours of operation, whichever comes first. Refer to the latest revision of Service Tips #1099 for convenient kit and fluid information. Refer to Mechanic's Tips, latest version, for location of the main filter and the filter change procedure. Service Tips #1099 and Mechanic's Tips are available online at www.allisontransmission.com.

Refer to the following Recommended Fluid/Filter Change tables for guidelines for fluid and filter change intervals.



NOTE: Change fluid/filters at or before recommended mileage, months, or hours have elapsed, whichever comes first. In some cases, operating hours may represent a more reliable measure of oil life; therefore, fluid change intervals should not be based on mileage alone.

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