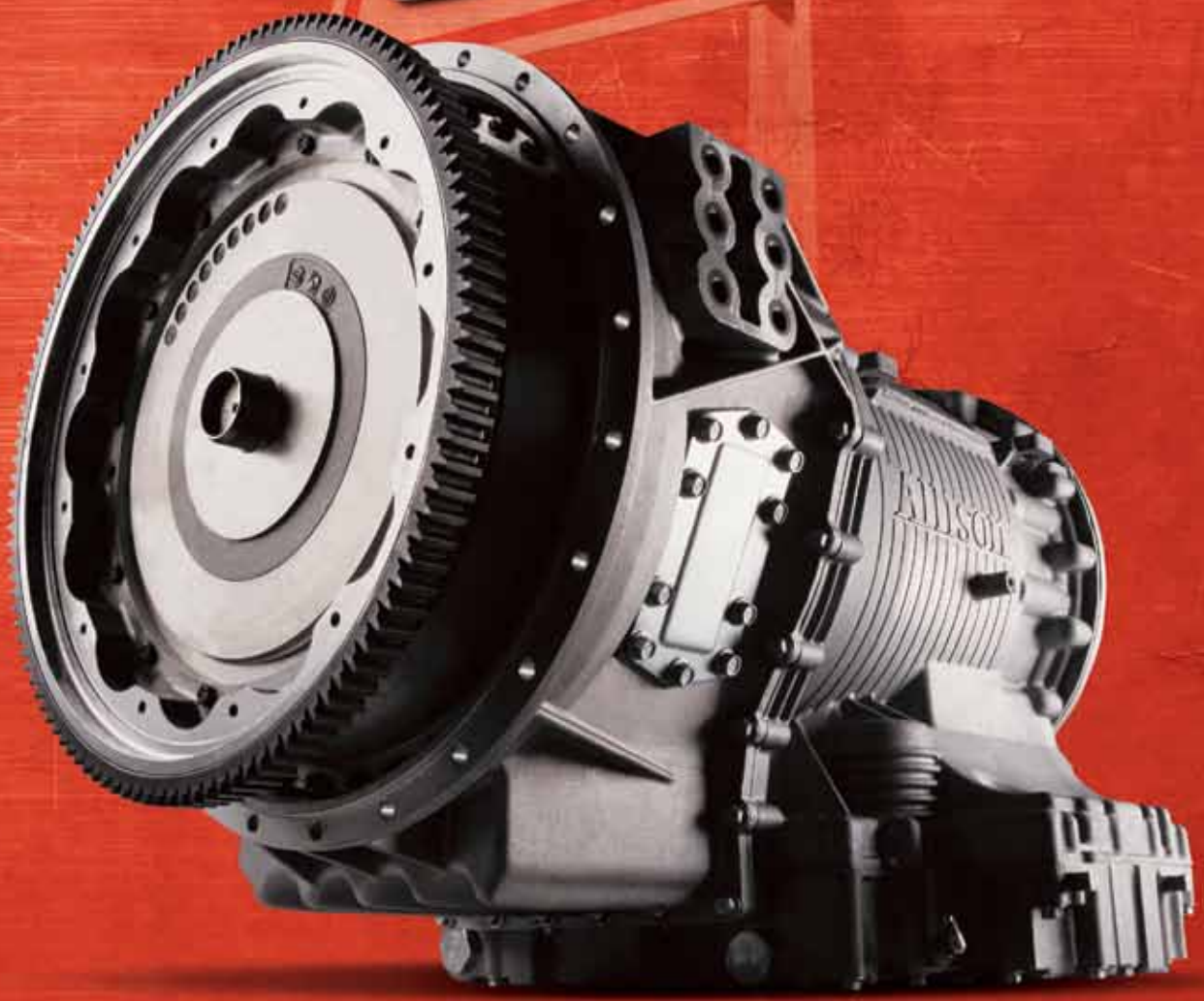
Allison Transmission

DRIVING TRANSMISSION TECHNOLOGY®

NO PARKING FIRE LANE

EMERGENCY VEHICLE SERIES



NOVEMBER 2011

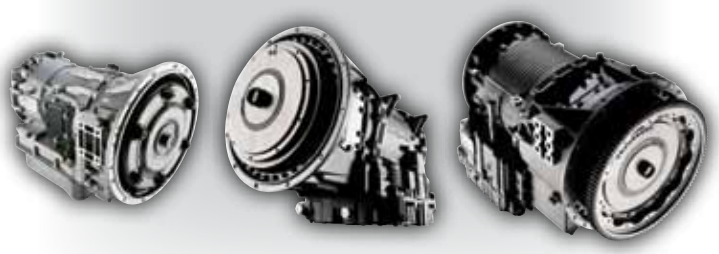
In emergency situations, time is critical. Allison Emergency Vehicle Series fully automatic transmissions are engineered to handle higher horsepower engines and deliver more torque to the wheels. That means emergency vehicles and their personnel get on scene faster and safer.

First on scene.

Allison offers a complete family of automatic transmissions to meet the special needs of fire and emergency vehicles. Any vehicle equipped with emergency signaling — siren, light bar, grill signal, porter light, etc. — that allows the vehicle to ignore general traffic laws in emergency situations must be equipped with an Allison Emergency Vehicle Series fully automatic transmission.

ENGINE hp (kW)	TORQUE lb-ft (N • m)
165–700 (123–522)	420–1950 (569–2644)

GVW lbs (kg)
14,000–unlimited (6,350–unlimited)



1000 EVS, 1350 EVS, 2100 EVS, 2200 EVS, 2350 EVS, 2500 EVS, 2550 EVS

3000 EVS, 3500 EVS

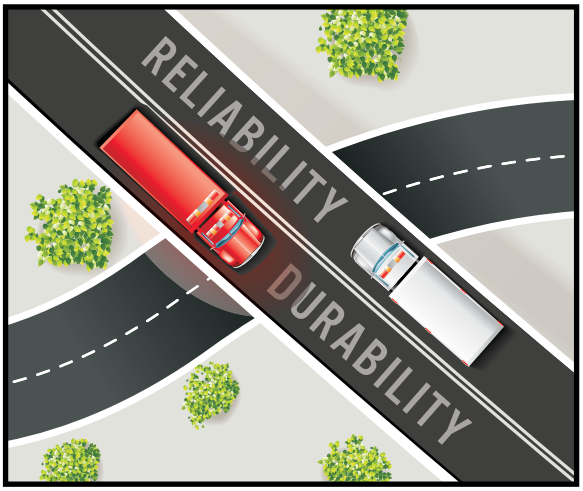
4000 EVS, 4500 EVS, 4700 EVS, 4800 EVS

Safe driving intelligence.

Allison Emergency Vehicle Series vocational models provide customized performance at your fingertips. The transmission automatically selects gears based on engine rpm, throttle position, vehicle load and road speed. However, you can manually control the upshifts and downshifts when it is necessary for safe driving in traffic or particular road conditions. The transmission will not allow you to select a range that will over-speed the engine.

Proven reliability and durability.

Allison Transmission has built a reputation on our ability to build transmissions that last. That is why Allison Emergency Vehicle Series transmissions are the preferred choice for all types of emergency vehicles.



Smart controls.

Our experience in this vocation has given us the knowledge and insight to design optional features into our transmissions to get the job done quickly and safely. Allison Emergency Vehicle Series transmissions are available with customized electronic control packages that meet the specific needs of a wide variety of emergency vehicles.

Prognostics

Calibrated to the vehicle's particular operating requirements, Allison prognostics monitor various operating parameters — oil level, oil life, filter life and transmission health — to determine and alert when service is due. This eliminates unnecessary oil and filter changes and provides maximum transmission protection.

Dual Input Auxiliary Function Range Inhibit

Provides an added level of safety and confidence by integrating two separate signals from different specialized vehicle equipment. It keeps the transmission in Neutral when both inputs are active and notifies the operator when one is active and the other is not.

Fire Truck Pump Mode

The transmission controls command an immediate shift to fourth range once the PTO engages and Drive is selected. One-to-one direct drive for split-shaft PTOs.

Retarder Enable

Get the best braking possible through total transmission retarder/vehicle integration. Electronic controls precisely blend the transmission, retarder and service brakes for peak efficiency.

Output Speed Indicator

Exceed a preset output speed and the transmission electronic controls produce a usable electronic signal for warning devices and other auxiliary vehicle equipment.

Additional electronic control packages are available. See your local Allison representative for the ones that fit your particular application.

Startability. Startability is a vehicle's capability to launch and pull a load. Simply put, it's the 'grunt' or 'get-up-and-go' of a truck. Often only the 1st gear ratio is used to judge a vehicle's startability. The truth is, one has to consider the engine torque at the required launch rpm and torque multiplication of the Allison torque converter. Manual and automated manual transmissions have to launch at very low engine rpm in order to prevent damage to the clutch. This means less torque, which is why they have very deep 1st gear ratios to help them overcome their clutch limitations. An Allison Automatic uses the full torque from the engine and multiplies it with the torque converter. Then, when the 1st gear ratio and rear axle ratio are factored in, the Allison provides greater startability.

Life cycle value. When you factor in all life cycle costs — vehicle purchase price, insurance, fuel, tires, preventive maintenance, component repair, driver wages, taxes, license, permits and retail resale value — along with the increased productivity, an Allison Automatic-equipped vehicle costs less per mile* to operate than a comparable competitively equipped vehicle.

*Results may vary depending on your operating conditions.

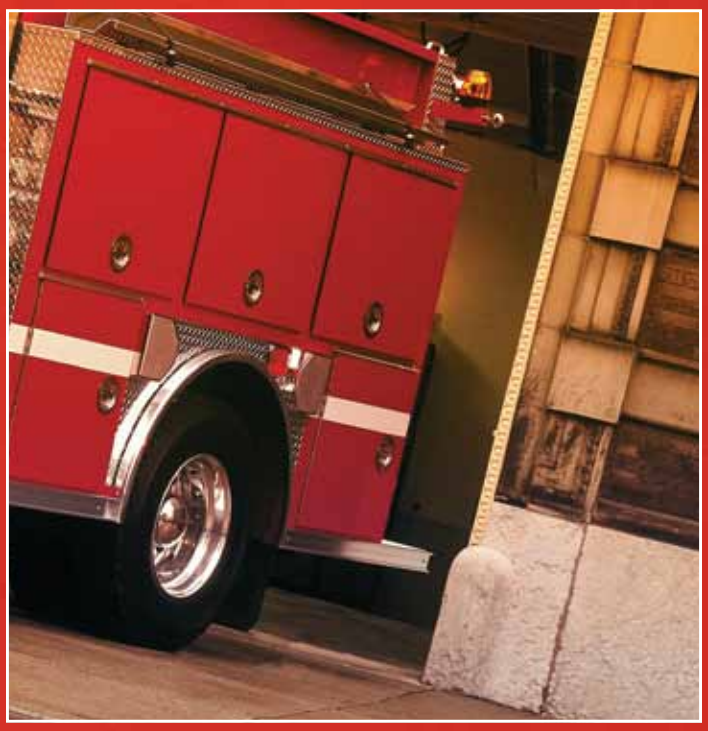
Raising the bar. Allison Emergency Vehicle Series automatic transmissions are specially designed for the critical demands of emergency vehicles, from ambulances to heavy-duty crash/fire vehicles. They raise driver and vehicle to new levels of performance. Allison's fully automatic shifts provide faster acceleration, which translates to quicker run times. On scene, precise vehicle positioning is accomplished with just subtle pressure on the accelerator. No other transmission contributes so much to getting the job done.

Braking news. Brake life, brake fade, brake wear — it's all about heat, the enemy of brake performance and lifespan. Every time the brake pedal goes down, brake temperature goes up. The only sure way to keep brakes cool is to stay off them. An Allison Automatic can help you do just that.

Independent testing has shown when drivers pre-selected downshifts, vehicles equipped with Allison Automatics exhibited significantly lower brake temperatures than manual- or automated manual-equipped vehicles. Lower brake temperature leads to longer brake life, less downtime and less bottom-line costs.

An Allison Automatic with a hydraulic retarder can handle virtually the entire braking demand in most situations. The Allison retarder is an integral part of the transmission and is cooled by the vehicle cooling system. It's also ABS compatible. In traffic, operators can use the retarder to slow the vehicle from the moment the accelerator is released.

2nd Reverse. This new feature offers a second "deep reverse" in addition to the standard reverse to provide greater control and engine braking during operation on steep grades. 2nd Reverse also enables more maneuverability when operating in confined spaces. When a vehicle is in 2nd Reverse, it has a slow creep capability with high engine speeds. With a mechanical ratio of -17.12:1, it has an effective torque converter multiplied ratio up to 32.5:1. 2nd Reverse provides overall better performance and enhanced applicability.



Maintenance made easy.

Routine oil and filter changes are the only regular preventive maintenance required with an Allison Automatic. Easily accessible integral and spin-on oil filters reduce labor costs and valuable downtime. TranSynd® TES 295 transmission fluid greatly extends oil change intervals.

Torque converter.

Increased shifting performance, faster acceleration, greater operating flexibility and minimal rollback are all advantages attributed to the patented heavy-duty Allison torque converter. The torque converter's cushion effect reduces shock and strain on all driveline components.

Allison gets you there faster and safer.

4800 EVS Meets ARFF Acceleration Standards	
0–50 MPH	TANK CAPACITY (gal)
30 sec.	60–528
25 sec.	528–1585
35 sec.	1585 or greater

PERCENTAGE FASTER THAN AN AMT or MANUAL					
	SPEED	3000 SERIES		4000 SERIES	
		AMT	MANUAL	AMT	MANUAL
ECONOMY MODE	0–20 mph	30%	22%	28%	19%
	0–30 mph	31%	14%	25%	25%
	0–40 mph	30%	15%	23%	30%
PERFORMANCE MODE	0–20 mph	38%	13%	33%	25%
	0–30 mph	39%	24%	29%	29%
	0–40 mph	36%	22%	26%	32%

Comprehensive coverage.

All Allison Emergency Vehicle Series automatic transmission models offer five-year comprehensive Standard Warranty with 100% parts and labor. Contact your Allison representative for details.

Our extensive network of over 1,200 authorized Allison Distributors and Dealers in North America, along with over 1,500 worldwide, means convenient, factory-quality Allison Transmission service is always close at hand.

Calibrated for emergencies.

All Allison Emergency Vehicle Series models feature emergency calibrations with special pattern logic inhibits tailored to the unique demands of emergency vehicles. For example, general truck calibrations prevent shifts from Neutral to a range if engine speed is above 900 rpm; however, emergency calibrations will tolerate a higher engine speed of 1260 rpm before preventing the shift.

Information Highway

Visit **www.allisontransmission.com** for a comprehensive library of informational brochures, including Mechanic's Tips, Operator's Manuals, Parts Catalogs, Troubleshooting Flyers and Service Manuals.

Ratings and Specifications

RATINGS

MODEL	RATIO	PARK PAWL	MAX INPUT POWER[1] hp (kW)	MAX INPUT TORQUE[1] lb-ft (N • m)	MAX INPUT TORQUE w/SEM OR TORQUE LIMITING[1,2] lb-ft (N • m)	MAX TURBINE TORQUE[3] lb-ft (N • m)	MAX GVW lbs (kg)	MAX GCW lbs (kg)
1000 EVS	Close Ratio	Yes	340[4,6] (254)[4,6]	575 (780)	660[4,6] (895)[4,6]	950[4] (1288)[4]	19,500 (8,845)	26,001 (11,800)
1350 EVS	Close Ratio	Yes	340[4,6] (254)[4,6]	575 (780)	660[4,6] (895)[4,6]	950[4] (1288)[4]	19,500 (8,845)	30,000 (13,600)
2100 EVS	Close Ratio	No	340[4,6] (254)[4,6]	575 (780)	660[4,6] (895)[4,6]	950[4] (1288)[4]	26,000 (11,800)	26,000 (11,800)
2200 EVS	Close Ratio	Yes	340[4,6] (254)[4,6]	575 (780)	660[4,6] (895)[4,6]	950[4] (1288)[4]	26,000 (11,800)	26,001 (11,800)
2350 EVS[6]	Close Ratio	Yes	340[4] (254)[4]	575 (780)	660[4] (895)[4]	950[4] (1288)[4]	30,000 (13,600)	30,000 (13,600)
2500 EVS	Wide Ratio	No	340[4,6] (254)[4,6]	575 (780)	660[4,6] (895)[4,6]	950[4] (1288)[4]	33,000 (15,000)	33,000 (15,000)
2550 EVS[6]	Wide Ratio	Yes	340[4] (254)[4]	575 (780)	660[4] (895)[4]	950[4] (1288)[4]	30,000 (13,600)	30,000 (13,600)
3000 EVS	Close Ratio	n/a	450 (336)	1250 (1695)	n/a	1700 (2305)	–	–
3500 EVS	Wide Ratio	n/a	330 (246)	985 (1335)	n/a	1500 (2034)	–	–
4000 EVS								
– Emergency	Close Ratio	n/a	600 (447)	1850 (2508)	n/a	2600 (3525)	–	–
– ARFF[7]	Close Ratio	n/a	600 (447)	1675 (2271)	n/a	2600 (3525)	–	–
4500 EVS	Wide Ratio	n/a	600 (447)	1770 (2400)	1850[5] (2508)[5]	2600 (3525)	–	–
4700 EVS								
– ARFF[7]	Widest Ratio	n/a	600 (447)	1850 (2508)	n/a	2800 (3795)	–	–
4800 EVS								
– ARFF[7]	Widest Ratio	n/a	700 (522)	1950 (2644)	n/a	2800 (3795)	–	–

1 Gross ratings as defined by ISO 1585 or SAE J1995. 2 SEM = engine controls with Shift Energy Management. 3 Turbine torque limit based on iSCAAN standard deductions. 4 SEM and torque limiting are required to obtain this rating.
5 Available in gears two through six. 6 Check with your OEM to ensure offerings. 7 Aircraft Rescue and Fire-Fighting Vehicle.

GEAR RATIOS – TORQUE CONVERTER MULTIPLICATION NOT INCLUDED

MODEL	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	REVERSE	2ND REVERSE[2]
1000/1350/2100/2200/2350 EVS	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1[1]	–	-4.49:1	–
2500/2550 EVS	3.51:1	1.90:1	1.44:1	1.00:1	0.74:1	0.64:1[1]	–	-5.09:1	–
3000 EVS	3.49:1	1.86:1	1.41:1	1.00:1	0.75:1	0.65:1	–	-5.03:1	–
3500 EVS	4.59:1	2.25:1	1.54:1	1.00:1	0.75:1	0.65:1	–	-5.00:1	–
4000 EVS	3.51:1	1.91:1	1.43:1	1.00:1	0.74:1	0.64:1	–	-4.80:1	–
4500 EVS	4.70:1	2.21:1	1.53:1	1.00:1	0.76:1	0.67:1	–	-5.55:1	–
4700/4800 EVS	7.63:1*	3.51:1	1.91:1	1.43:1	1.00:1	0.74:1	0.64:1	-4.80:1	-17.12:1

* Manually selected first gear. 1 Check with your OEM to ensure offerings. 2 SEM/LRTP or LRTP Only is required.

ENGINE SPEEDS

MODEL	FULL LOAD GOVERNED SPEED Min-Max (rpm)	IDLE SPEED IN DRIVE Min-Max (rpm)	OUTPUT SHAFT SPEED rpm
1000/1350/2100/2200/2350 EVS	2200-4600[1]	500-820	5000
2500/2550 EVS	2200-3200	500-820	4500
3000/3500 EVS	1950-2800	500-800	3600[2]
4000/4500/4700/4800 EVS	1700-2300	500-800	–

1 Engines with full load governed speed greater than 3800 rpm require Application Engineering review. 2 Retarder-equipped models only.

STANDARD POWER TAKEOFF PROVISION – CONTINUOUS OPERATION

BASE MODEL	MOUNTING PAD POSITIONS VIEWED FROM REAR	DRIVE GEAR RATING WITH ONE PTO lb-ft (N • m)	DRIVE GEAR RATING WITH TWO PTOS lb-ft (N • m)	DRIVE
1000/2000 EVS	3 and 9 o'clock	250 (339)	200[2] (271)[2]	Turbine
3000 EVS[1]	Side/Side 4 and 8 o'clock	485 (660)	685[3,4] (930)[3,4]	Engine
	Top/Side 1 and 8 o'clock	670 (910)	685[3,4] (930)[3,4]	Engine
4000 EVS[1]	1 and 8 o'clock	685 (930)	1175[3,4] (1595)[3,4]	Engine

1 PTO-delete option available. 2 Rating per PTO. 3 Total on the drive gear. 4 Minimum 600 rpm idle speed required when dual PTOs are used simultaneously.

OPTIONAL RETARDER PROVISION – INTEGRAL, HYDRAULIC TYPE

BASE MODEL	TORQUE CAPACITY lb-ft (N • m)	POWER CAPACITY hp (kW)
3000 EVS		
– High	1600 (2170)	600 (447)
– Medium	1300 (1760)	500 (373)
– Low	1100 (1490)	400 (298)
4000 EVS[1]		
– High	2000 (2710)	600 (447)
– Medium	1600 (2170)	600 (447)
– Low	1300 (1760)	500 (373)

1 Only medium-capacity available on 4700 EVS and 4800 EVS.

TORQUE CONVERTER SPECIFICATIONS

BASE MODEL	TORQUE CONVERTER	NOMINAL STALL TORQUE
1000 EVS	TC-210	2.05
	TC-211	1.91
	TC-221	1.73
	TC-222	1.58
2000 EVS	TC-210	2.05
	TC-211	1.91
	TC-221	1.73
	TC-222	1.58
3000 EVS	TC-411	2.71
	TC-413	2.44
	TC-415	2.35
	TC-417	2.20
	TC-418	1.98
	TC-419	2.02
	TC-421	1.77
4000 EVS	TC-521	2.42
	TC-531	2.34
	TC-541	1.90
	TC-551	1.79
	TC-561	1.58

PHYSICAL DESCRIPTION

BASE MODEL	LENGTH[1] in (mm)	DEPTH[2] w/DEEP OIL PAN/SUMP in (mm)	DEPTH[2] w/SHALLOW OIL PAN/SUMP in (mm)	DRY WEIGHT lbs (kg)
1000 EVS				
– SAE No. 3 mounting	28.01 (711.4)	11.22 (284.9)	10.71 (272.0)	330 (150)
– SAE No. 2 mounting	28.39 (721.1)	11.22 (284.9)	10.71 (272.0)	330 (150)
2000 EVS				
– SAE No. 3 mounting	28.01 (711.4)	11.22 (284.9)	–	330 (150)
– SAE No. 2 mounting	28.39 (721.1)	11.22 (284.9)	–	330 (150)
3000 EVS				
– Basic model	28.29 (718.6)	12.90 (327.8)	11.14 (283.1)	535 (243)
– With PTO only	32.49 (825.4)	12.90 (327.8)	11.14 (283.1)	575 (261)
– With retarder only	28.29 (718.6)	12.90 (327.8)	11.14 (283.1)	615 (279)
– With PTO & retarder	32.49 (825.4)	12.90 (327.8)	11.14 (283.1)	655 (298)
4000/4500 EVS				
– Basic model	30.54 (775.8)	14.75 (374.7)	13.17 (334.6)	831 (377)
– With PTO only	33.42 (848.8)	14.75 (374.7)	13.17 (334.6)	893 (405)
– With retarder only	30.54 (775.8)	14.75 (374.7)	13.17 (334.6)	906 (411)
– With PTO & retarder	33.42 (848.8)	14.75 (374.7)	13.17 (334.6)	968 (439)
4700/4800 EVS				
– Basic model	40.61 (1031.6)	14.88 (378.2)	–	1087 (493)
– With PTO only	43.48 (1104.6)	14.88 (378.2)	–	1149 (521)
– With retarder only	40.61 (1031.6)	14.88 (378.2)	–	1162 (527)
– With PTO & retarder	43.48 (1104.6)	14.88 (378.2)	–	1224 (555)

1 Length measured from flywheel housing to end of output shaft. 2 Depth measured below transmission centerline.

OIL SYSTEM

BASE MODEL	CAPACITY[1] quarts (liters)	MAIN CIRCUIT FILTER	LUBE CIRCUIT FILTER	ELECTRONIC OIL LEVEL SENSOR (OLS)
1000 EVS		Spin-On Canister	–	–
– Deep Oil Pan	14.8 (14.0)			
– Shallow Oil Pan	12.7 (12.0)			
2000 EVS		Spin-On Canister	–	–
– Deep Oil Pan	14.8 (14.0)			
3000 EVS		Integral	Integral	Standard
– Deep Oil Sump w/o PTO	29 (27.4)			
– Shallow Oil Sump w/o PTO	26 (24.6)			
4000 EVS		Integral	Integral	Standard[2]
– Deep Oil Sump and PTO	51 (48)			
– Deep Oil Sump	48 (45)			
– Shallow Oil Sump and PTO	43 (41)			
– Shallow Oil Sump	40 (38)			

Recommended oil type for all models is Allison Approved TES 295 transmission fluid.

1 Transmission only. Does not include cooler, hoses or fittings. Amount of oil necessary to fill a dry transmission.
2 4700 EVS and 4800 EVS retarder models must use 4-inch sump without OLS.

ALLISON BRAND PROMISE

The Allison Brand Promise is the automatic experience with an unrivaled combination of Quality, Reliability, Durability, Vocational Value, and Customer Service.

P.O. Box 894, Speed Code PF3
Indianapolis, Indiana 46206-0894

SA3564EN (2011/11)
ISO/QS 9000 and ISO 14001 Certified

Allison Transmission®

DRIVING TRANSMISSION TECHNOLOGY®