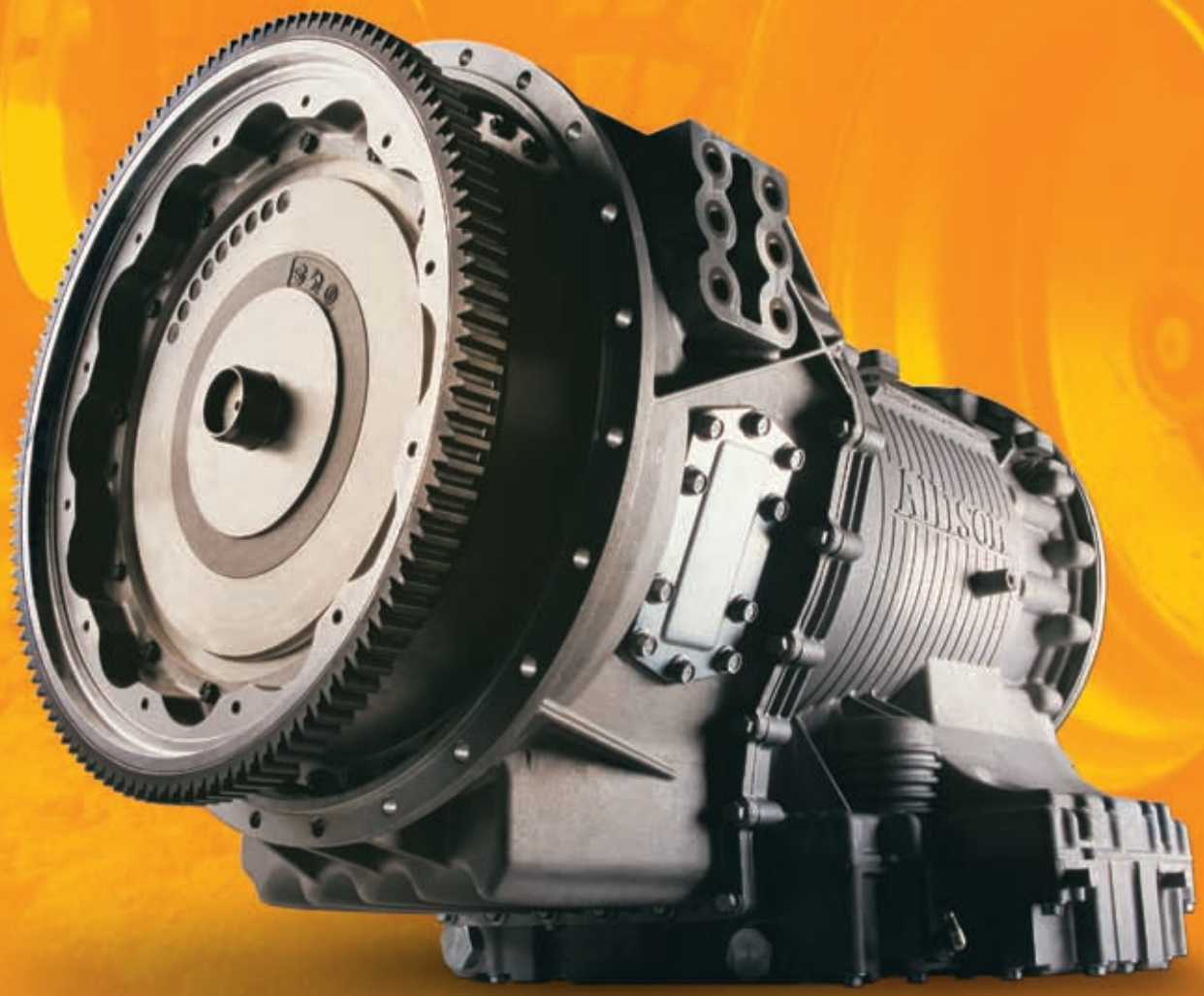
DRIVING TRANSMISSION TECHNOLOGY™

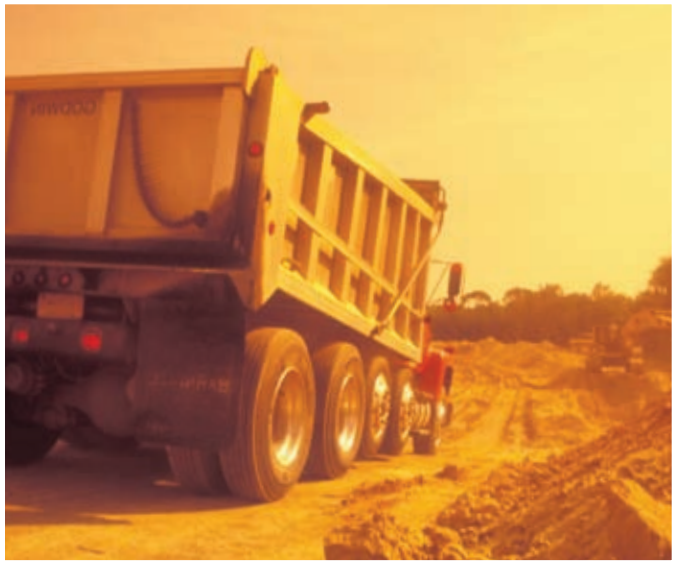
Allison Transmission®



RUGGED DUTY SERIES

MARCH 2009

Your trucks and your drivers don't lead a pampered life. They work hard in tough conditions, day in, day out. Their performance and productivity rise to a whole new level when you spec Allison Rugged Duty Series fully automatic transmissions.



Working harder and smarter.

Allison Rugged Duty Series fully automatic transmissions fit operating requirements better than other transmissions because they've been engineered specifically for the way you work.

On pavement, seamless full-power shifts mean faster acceleration for shorter trip times. In traffic, there's no relentless shifting, as with manuals. No unpredictable and delayed shifting, as with automated manuals. And neither can compare to Allison's vehicle control on a grade.

Off-road, with their patented torque converter technology, Allison Automatics provide smooth, effortless shifting and precise traction control. By just pressing the accelerator, you can modulate power to the wheels. Manuals and automated manuals cause the drive wheels to dig in and bog down. Allison Automatics achieve just the right amount of traction for load and ground conditions — dirt, mud, sand or gravel. They can take whatever you throw at them and still deliver.

Spec for the job.

While most vehicles are purchased for specific vocational use, they are not always spec'd to fit their particular operating conditions. For example, on-/off-highway trucks are spec'd for duty on grades — yet fleet studies have shown that they spend a majority of their time getting to and from the job sites — on grades less than 2%. The result is often too much horsepower purchased for the operating ranges that trucks are in 90% of the time. Not only will Allison Automatics increase vehicle productivity, with their extended torque ranges and higher GVW capacities, they allow you to spec a wider array of engine options.

Torque converter.

The heavy-duty Allison torque converter is at the heart of what makes an Allison Automatic the most effective, efficient and productive commercial transmission in the world. Increased shifting performance, faster acceleration, greater operating flexibility and minimal rollback are all advantages that can be attributed to it. Its cushion effect reduces shock and strain on the entire driveline — including engine, universal joints, driveshafts and rear axle — prolonging the operating life of the components.

Life cycle value.

Over the life of the vehicle, an Allison Automatic provides improved cost-per-yard mile* for on-/off-highway vehicles when compared with the cost of operating a vehicle with a manual or automated manual transmission.

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 yard mile* to operate than a comparable manual- or automated manual-equipped vehicle.

*Results may vary depending on your operating conditions. See your local Authorized Allison Dealer to find the potential productivity gains for your particular business.

Road Safety.

Rollback is a concern for drivers of vehicles equipped with manuals and automated manuals because it can cause accidents and product/load damage. Since there is very little rollback on vehicles equipped with Allison Automatics, drivers don't have that concern.

More vehicle control under all conditions, far less fatigue for drivers since they're not shifting hundreds of times a day and so much simpler operation than a manual or automated manual transmission means there simply aren't as many distractions for the driver of an Allison Automatic-equipped vehicle.

Smooth operation.

The 1000 RDS, 2100 RDS and 2200 RDS models feature high-density start and stop calibrations† providing improved shift operation, especially in congested traffic areas.

† Calibrations are required for the 1000 RDS, 2100 RDS and 2200 RDS.

Allison Transmission Fourth Generation Electronic Controls

ENGINE hp (kW)	TORQUE lb-ft (N • m)
300–600 (224–447)	550–1850 (746–2508)

GVW lbs (kg)
19,500–unlimited (8,845–unlimited)

1000 RDS, 2100 RDS, 2200 RDS, 2300 RDS, 2350 RDS, 2500 RDS, 2550 RDS

3000 RDS, 3500 RDS

4000 RDS, 4500 RDS, 4700 RDS

FUEL ECONOMY vs. FUEL EFFICIENCY

Fuel economy is a function of fuel consumed over a certain distance. Fuel efficiency includes time in the equation. Most businesses account for time – how much work is accomplished in a certain amount of time. How many deliveries or runs your trucks make in a day, week or month is what really matters. Not just how many miles they traveled.

With full-power shifts, Allison Automatic-equipped vehicles not only accelerate faster, they get up to and work within the best duty-cycle speeds faster and more efficiently. That saves time on routes, which can lead to greater productivity. In other words, more work gets done. *That's fuel efficiency.*

Tests have shown that an Allison-equipped vehicle can produce higher average speeds and deliver maximum fuel economy during acceleration, deceleration and at various cruise speeds. No other transmission can deliver this type of value. See your Allison truck specification expert for more details.

Shifting performance.

Not even the most expert driver can shift at the precise shift points to optimize vehicle performance under all road and load conditions. An Allison Automatic automatically makes the right shift at the right time to maximize vehicle performance and protect the driveline.

On a vehicle with a manual or automated manual transmission, there are seven to eight shifts per mile in an average cycle. The power interrupts that occur during these shift changes result in lower average wheel horsepower and a loss of 14-16 seconds every mile.

There are no power interrupts with Allison Automatics, just smooth, seamless full-power shifts. By making full use of the engine's horsepower, an Allison Automatic may allow you to specify a smaller engine, saving you money in the long run. Plus, faster trips add up to more deliveries per day, which means increased incremental revenue from your vehicle.

Shift energy management.

1000 RDS, 2100 RDS, 2200 RDS, 2300 RDS, 2500 RDS, 3000 RDS and 4500 RDS models feature Shift Energy Management (SEM) to help conserve fuel, provide better acceleration and help carry a load more efficiently. With SEM, the transmission electronically controls the engine during shifts to maintain a constant output of torque. SEM helps get all the torque needed to get the job done.

Economy and performance modes.

Only Allison Transmission offers you a choice of operating modes to best suit your driving conditions and business needs. Allison Rugged Duty Series models offer primary and secondary shift schedules to enhance fuel savings or add more power. In "economy" mode, the transmission shifts at lower engine speed to provide added fuel savings during operation. In "performance" mode, the transmission upshifts at higher engine speed for quicker acceleration.

Smart controls.

Allison Rugged Duty Series automatic transmissions have brains in addition to brawn. Optional electronic control packages provide precisely the performance features you need to get the job done – whatever it may be.

PTO ENABLE

PTO integration made simple using the transmission electronic controls. Commands how and when the PTO engages and monitors operating conditions to minimize potential damage and hazards.

AUXILIARY FUNCTION RANGE INHIBIT

It's like an extra set of eyes – making sure outriggers are up, buckets are stowed, doors are shut. Avoid unwanted shifts out of Neutral. Integrates with virtually any vocational vehicle component.

AUTOMATIC NEUTRAL

The transmission electronic controls know when to command Neutral – automatically. No need for the driver to shift. Automatic Neutral gets it done – on every job and at every stop. It's one less thing the driver has to do.

RANGE INDICATOR

Choose the range. Create a reaction. Range Indicator provides a usable electric signal when the transmission shifts to a chosen range.

FOURTH LOCKUP PUMP MODE

Step-by-step operator inputs control split-shaft operation and automatically shift the transmission to fourth lockup for direct 1:1 drive from the engine.

Low maintenance costs.

Drivers simply can't mis-shift an Allison Automatic. The smooth, seamless shifts virtually eliminate driveline component shock. Since Allison Automatics don't have mechanically-applied clutches, you won't have routine clutch burnout and replacement – a major downtime concern with manual and automated manual transmissions.

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 for most applications.

Comprehensive coverage.

All Rugged Duty Series vocational models offer comprehensive coverage with 100% parts and labor. Coverage may vary by model and by application. Please contact your Authorized Allison Dealer for further details.

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 RDS	Close Ratio	Yes	340[4,7] (254)[4,7]	550 (746)	660[4,7,9] (895)[4,7,9]	850 (1152)	19,500 (8,845)	26,000 (11,800)
2100 RDS	Close Ratio	No	340[4,7] (254)[4,7]	550 (746)	660[4,7,9] (895)[4,7,9]	850 (1152)	26,000 (11,800)	26,000 (11,800)
2200 RDS	Close Ratio	Yes	340[4,7] (254)[4,7]	550 (746)	660[4,7,9] (895)[4,7,9]	850 (1152)	26,000 (11,800)	26,000 (11,800)
2300 RDS[5]	Close Ratio	No	325 (242)	n/a	450 (610)	850 (1152)	33,000 (15,000)	33,000 (15,000)
2350 RDS[7]	Close Ratio	Yes	340[4] (254)[4]	550 (746)	660[4,9] (895)[4,9]	850 (1152)	30,000 (13,600)	30,000 (13,600)
2500 RDS								
– On-/Off- Highway	Wide Ratio	No	340[4,7] (254)[4,7]	550 (746)	660[4,7,9] (895)[4,7,9]	850 (1152)	33,000 (15,000)	33,000 (15,000)
– Refuse	Wide Ratio	No	300 (224)	550 (746)	565 (766)	850 (1152)	24,200 (11,000)	24,200 (11,000)
2550 RDS[7]	Wide Ratio	Yes	340[4] (254)[4]	550 (746)	660[4,9] (895)[4,9]	850 (1152)	30,000 (13,600)	30,000 (13,600)
3000 RDS								
– On-/Off- Highway	Close Ratio	n/a	370 (276)	1100 (1491)	1250[6,7] (1695)[6,7]	1600 (2169)	80,000 (36,288)	80,000 (36,288)
– On- Highway	Close Ratio	n/a	370 (276)	1100 (1491)	1250[6,7] (1695)[6,7]	1600 (2169)	80,000 (36,288)	80,000 (36,288)
– Mixer/Refuse	Close Ratio	n/a	370 (276)	1100 (1491)	1250[6,7] (1695)[6,7]	1600 (2169)	62,832 (28,500)	–
– Specialty PTO, HET	Close Ratio	n/a	370 (276)	1250[7] (1695)[7]	n/a	1700 (2305)	–	–
3500 RDS								
– On-/Off- Highway	Wide Ratio	n/a	300 (224)	860 (1166)	n/a	1420 (1925)	80,000 (36,288)	80,000 (36,288)
– Mixer/Refuse	Wide Ratio	n/a	300 (224)	860 (1166)	n/a	1420 (1925)	60,000 (27,216)	–
– HET	Wide Ratio	n/a	330 (246)	985 (1335)	n/a	1450 (1966)	–	–
– Specialty PTO	Wide Ratio	n/a	315 (235)	950 (1288)	n/a	1450 (1966)	–	–
4000 RDS								
– On-/Off- Highway	Close Ratio	n/a	550 (410)	1770 (2400)	1850[9] (2508)[9]	2600 (3525)	–	–
– Refuse	Close Ratio	n/a	500 (373)	1550 (2102)	n/a	2450 (3322)	–	–
– Specialty PTO	Close Ratio	n/a	550 (410)	1770 (2400)	n/a	2600 (3525)	–	–
– HET	Close Ratio	n/a	600 (447)	1850 (2508)	n/a	2600 (3525)	–	–
4500 RDS								
– On-/Off- Highway	Wide Ratio	n/a	550 (410)	1650 (2237)	1850[9] (2508)[9]	2450 (3322)	–	–
– Refuse	Wide Ratio	n/a	500 (373)	1550 (2102)	n/a	2450 (3322)	–	–
– Specialty PTO	Wide Ratio	n/a	550 (410)	1650 (2237)	1770[8] (2400)[8]	2600 (3525)	–	–
– HET	Wide Ratio	n/a	600 (447)	1650 (2237)	1850[8] (2508)[8]	2600 (3525)	–	–
4700 RDS								
– On-/Off- Highway	Widest Ratio	n/a	550 (410)	1770 (2400)	1850[10] (2508)[10]	2600 (3525)	–	–
– Refuse	Widest Ratio	n/a	500 (373)	1550 (2102)	n/a	2450 (3322)	–	–
– HET	Widest Ratio	n/a	600 (447)	1850 (2508)	n/a	2600 (3525)	–	–

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 Only available for VORTEC 8.1L gasoline powered engine applications. 6 Requires Allison Transmission engine-transmission combination approval. Only available in gears three through six.
7 Check with your OEM to ensure offerings. 8 Available in gears two through six. 9 Only available in gears three through six. 10 Only available in gears four through seven.

GEAR RATIOS – TORQUE CONVERTER MULTIPLICATION NOT INCLUDED

MODEL	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	REVERSE
1000 RDS/2100 RDS 2200 RDS/2300 RDS	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1[1]	–	-4.49:1
2350 RDS	3.10:1	1.81:1	1.41:1	1.00:1	0.71:1	0.61:1[1]	–	-4.49:1
2500 RDS	3.51:1	1.90:1	1.44:1	1.00:1	0.74:1	0.64:1[1]	–	-5.09:1
2550 RDS	3.51:1	1.90:1	1.44:1	1.00:1	0.74:1	0.64:1[1]	–	-5.09:1
3000 RDS	3.49:1	1.86:1	1.41:1	1.00:1	0.75:1	0.65:1	–	-5.03:1
3500 RDS	4.59:1	2.25:1	1.54:1	1.00:1	0.75:1	0.65:1	–	-5.00:1
4000 RDS	3.51:1	1.91:1	1.43:1	1.00:1	0.74:1	0.64:1	–	-4.80:1
4500 RDS	4.70:1	2.21:1	1.53:1	1.00:1	0.76:1	0.67:1	–	-5.55:1
4700 RDS	7.63:1*	3.51:1	1.91:1	1.43:1	1.00:1	0.74:1	0.64:1	-4.80:1

* Manually selected first gear.
1 Check with your OEM to ensure offerings.

ENGINE SPEEDS

MODEL	FULL LOAD GOVERNED SPEED Min-Max (rpm)
1000 RDS	2200-4600[1]
2100/2200/2300 RDS	2200-4600[1]
2350 RDS	2200-4600[1]
2500 RDS	2200-3200
2550 RDS	2200-3200
3000/3500 RDS	2000-2800
4000/4500/4700 RDS	1700-2300

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

OPTIONAL RETARDER PROVISION – INTEGRAL, HYDRAULIC TYPE

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

1 Only medium-capacity available on 4700 RDS.

TORQUE CONVERTER SPECIFICATIONS

BASE MODEL	TORQUE CONVERTER	NOMINAL STALL TORQUE
1000 RDS	TC-210	2.05
	TC-211	1.91
	TC-221	1.73
	TC-222	1.58
2000 RDS	TC-210	2.05
	TC-211	1.91
	TC-221	1.73
	TC-222	1.58
3000 RDS	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 RDS	TC-521	2.42
	TC-531	2.34
	TC-541	1.90
	TC-551	1.79
	TC-561	1.58

IDLE SPEED IN DRIVE Min-Max (rpm)	OUTPUT SHAFT SPEED rpm
500-820	5000
500-820	5000
500-820	5000
500-820	4500
500-820	4500
500-800	3600[2]
500-800	–

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 RDS	3 and 9 o'clock	250 (339)	200[2] (271)[2]	Turbine
2000 RDS	3 and 9 o'clock	250 (339)	200[2] (271)[2]	Turbine
3000[1] RDS	side/side 4 and 8 o'clock	485 (660)	685[3, 4] (930)[3, 4]	Engine
	top/side 1 and 8 o'clock	485 (660)	685[3, 4] (930)[3, 4]	Engine
4000[1] RDS	1 and 8 o'clock	685 (930)	1175[3, 4] (1595)[3, 4]	Engine

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

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 RDS	– 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 RDS	– 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)
3000 RDS	– 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 RDS 4500 RDS	– 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 RDS	– 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 RDS		Spin-On Canister	–	–
– Standard Oil Sump	14.8[2] (14)[2]			
2000 RDS		Spin-On Canister	–	–
– Standard Oil Sump	14.8[2] (14)[2]			
3000 RDS		Integral	Integral	Standard
– Deep Oil Sump w/o PTO	29[2] (27.4)[2]			
4000/4500 RDS		Integral	Integral	Standard
– Deep Oil Sump and PTO	51[2] (48)[2]			
– Deep Oil Sump	48[2] (45)[2]			
4700 RDS		Integral	Integral	Standard[3]
– Deep Oil Sump and PTO	54[2] (51)[2]			
– Deep Oil Sump	51[2] (48)[2]			

Recommended oil types for all models are TranSynd™ / TES 295 approved.

1 Transmission only. Does not include cooler, hoses or fittings. 2 Amount of oil necessary to fill a dry transmission.
3 4700 RDS retarder model must use 4-inch sump without OLS.

Ask for the Allison

RUGGED DUTY SERIES

Ask your truck dealer for a complete listing of vehicle models featuring Allison Rugged Duty Series transmissions, or contact your Authorized Allison Distributor. For the representative close to you, visit **www.allisontransmission.com.**

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Allison Transmission®

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