

Spicer® Components



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Drivetrain Products

Dana Commercial Vehicle Warranty Guide

CVWG-0900

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General Information

Knowing and understanding Dana warranty is the responsibility of the vehicle owner. It is also the responsibility of the selling dealer to identify the Dana products in the vehicle and inform the purchaser of the warranty for those products, based on the vehicle vocation at the time of sale.

The combined use of the Dana Commercial Vehicle Warranty Manual and the Dana Commercial Vehicle Warranty Guide expresses Dana component time and mileage warranty coverages for the Dana products. Dana warranty training is also available to assist dealers in understanding and identifying vocation coverage and warranty parameters. See your Dana Representative for details.

Dana Commercial Vehicle Warranty Guide

Dana component warranty is identified using the Dana Commercial Vehicle Warranty Guide. The Dana Commercial Vehicle Warranty Guide explains Dana vocation definitions, component time and mileage limits per vocation, aftermarket component / part warranties, and extended purchase warranty options.

How do I define my vocation coverage?

1. Review all the “Vocational Definitions” listed and select the one that most accurately describes the use and configuration of the vehicle.
2. Ensure your vehicle vocation is listed in the “Typical Vehicle Types” under the selected Vocational Definition.
3. Once the vocation is defined refer to the “Product Time and Mileage Coverage Per Vocation” section.
4. Identify the component in question using the product model number for the time and mileage coverage.
5. Refer to and understand any notes that pertain to a specific coverage (i.e. lube requirements).
6. If you cannot determine coverage, contact your Dana Representative or call the Dana Call Center at the time of sale at 1-877-777-5360.

Dana Commercial Vehicle Warranty Manual

The Dana Commercial Vehicle Warranty Manual documents the specifics of Dana product warranty. This manual includes:

- Product Warranty Statements for Dana Commercial Vehicle Product Group of Dana
- Warranty terminology
- Warranty programs
- Claim procedures and claim information
- Important information regarding claim approval
- Component repair or replacement guidelines
- Labor hour guidelines (SRTs)
- Limits, exclusions, and requirements
- Other important resources

Other Important Resources

Printed copies of this document are not controlled. Please refer to the electronic copy on www.dana.com for up-to-date information. For additional information on the below topics, see the below publications available on www.dana.com:

Lubrication

- Spicer Approved Lubricants, Rev. 1
- Spicer Product Lubrication Manual, Rev. 1

Warranty

- Extended Protection Plan Registration Form
- Dana Commercial Vehicle Warranty Guide (Time and Mileage, Vocational Definitions, Purchased Warranties)

General Repair & Service

- Axle Failure Analysis
- Seal Maintenance Guide
- Understanding Spur Gear Life

Introduction

Our experience in extended warranty coverage dates back to the mid 80's. Since then, we have pioneered many new programs designed to deliver warranties, which meet the demands of an ever-changing trucking industry.

From our first versions of the on/off-highway coverages, to our more recent vocational warranties, released in January 1997, customization and customer satisfaction, have always been our goals. The recently released warranties, covered in this Warranty Guide, are no exception.

Moving to vocational warranties in 1997, was certainly a change from the way coverages were defined in the past. But, we considered the move as a means to significantly reduce incidents of misapplied products and customer disappointment. It has done exactly that.

When first released, the vocational warranties were a fairly complete package, which allowed for many variations in coverage. However, the introduction of new models and the resulting need to expand extended warranty coverages, have necessitated updates to this Dana Commercial Vehicle Warranty Guide.

Effective Date

Warranties listed in this guide are effective for vehicles placed in service after the first day for the month / year of this publication month / year revision.

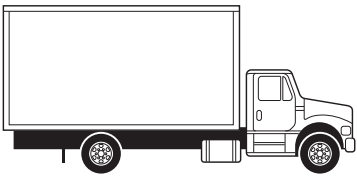
Don't Be Confused - Help is Available

We realize, there are many different warranties available. Manufacturers and suppliers have established coverages to suit their specific products. Remembering all these guidelines, can be very difficult.

If, at any time, you have questions regarding Dana warranty coverages or model eligibility, contact the Dana Call Center at 1-877-777-5360. A customer service coordinator will be glad to assist you in getting the answers you need.

For warranty limits, exclusions, and requirements see the end of this guide for the Dana Commercial Vehicle Warranty.





Vocational Description

- Pickup and delivery service within cities and/or suburban areas
- 100% of operation on road surfaces of concrete, asphalt and maintained gravel
- Three (3) miles between start/stops (typical)
- 100% going/up to 40% load return (typical)

Typical Vehicle Types

Armored Truck	General Freight Truck	Pickup and Delivery	Side Truck
Ambulance	Livestock Hauler	Postal Delivery	Stake Truck
Auto Transport Truck	Moving Van	Refrigerated Truck	Tanker Truck
Beverage Truck	Municipal Truck	Regional Haul	Utility Truck
Flatbed Truck	Newspaper Delivery	Roll Back Auto Transporter	Wrecker

Service Definitions (vocational description applies to all operations)

- Operation 1 Grades up to 8%
- Operation 2 Grades up to 12%
- Operation 3 Grades up to 20%

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

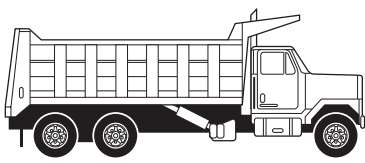
Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S110, S111, S130, S140, 17060S, 19060S, 21060S, 21065T, 22065T, 23083T, 26082T	2 Years / Unlimited Mileage
	S21-170, S21-190, S23-170, S23-190, S25-190, S26-190	3 Years / 350,000 Miles (560,000 km)
Tandem Drive Axles	DS404, DS405	2 Years / Unlimited Mileage
	D40-145, D40-155, D40, 156, DSH40, D40-170	3 Years / 350,000 Miles (560,000 km)
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)			Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 8% Grade	Operation 2 12% Grade	Operation 3 20% Grade	Fastest	Slowest	
Single Axles										
S14-110	13,500	16.5	325	560	23,000	23,000	N/A	3.73	5.38	
S14-130	13,500	15.7	300	660	25,000	25,000	N/A	3.73	5.38	
S16-130	15,500	18.1	325	605	35,000	25,000	N/A	3.73	5.38	
S17-140	17,000	19.7	300	860	46,000	40,000	N/A	3.58	5.57	
17060S	17,000	19.7	300	860	60,000	50,000	45,000	3.08	5.57	
S19-140	19,000	19.7	300	860	46,000	40,000	N/A	3.58	5.57	
19060S	19,000	20.1	300	860	60,000	50,000	45,000	3.08	5.57	
19055P	19,000	20.1	300	860	60,000	55,000	50,000	5.32	7.60	
19055T	19,000	20.1	300	860	60,000	55,000	50,000	3.90/5.32	5.57/7.60	
S20-140	20,000	19.7	300	860	46,000	40,000	N/A	3.58	5.57	
S21-140	21,000	19.7	300	860	46,000	40,000	N/A	3.58	5.57	
21060S	21,000	21.1	300	860	60,000	50,000	45,000	3.08	5.57	
21065P	21,000	21.1	300	860	60,000	55,000	50,000	5.32	7.60	
21065T	21,000	21.1	300	860	60,000	55,000	50,000	3.90/5.32	5.57/7.60	
S21-170	21,000	21.1	405	1450	80,000	65,000	55,000	3.07	5.57	
S21-170E	21,000	21.1	405	1450	80,000	65,000	55,000	3.07	5.57	
S21-190	21,000	22.0	485	1650	100,000	85,000	70,000	3.07	5.57	
S21-190E	21,000	22.0	485	1650	100,000	85,000	70,000	3.42	5.57	
22060S	22,000	21.1	300	860	60,000	50,000	45,000	3.08	5.57	
22065P	22,000	21.1	300	860	60,000	55,000	50,000	5.32	7.60	
22065T	22,000	21.1	300	860	60,000	55,000	50,000	3.90/5.32	5.57/7.60	
23060SH	23,000	19.8	300	860	60,000	50,000	45,000	3.08	5.57	
23082T	23,000	22.0	405	1450	80,000	65,000	55,000	3.70/5.04	5.43/7.39	
S23-170	23,000	22.0	405	1450	80,000	65,000	55,000	3.07	5.57	
S23-170E	23,000	22.0	405	1450	80,000	65,000	55,000	3.07	5.57	
S23-190	23,000	22.0	485	1650	100,000	85,000	70,000	3.07	5.57	
S23-190	23,000	19.8	550	1850	80,000	70,000	60,000	3.07	4.30	
S23-190E	23,000	22.0	485	1650	100,000	85,000	70,000	3.42	5.57	
S25-170	25,000	22.0	405	1450	80,000	65,000	55,000	3.42	5.57	
S25-170E	25,000	22.0	405	1450	80,000	65,000	55,000	3.42	5.57	
26082T	26,000	22.0	405	1450	80,000	65,000	55,000	3.70/5.04	5.43/7.39	
S26-190	26,000	22.0	485	1650	100,000	85,000	70,000	3.42	5.57	
S26-190E	26,000	22.0	485	1650	100,000	85,000	70,000	3.42	5.57	
EconoTrek 6x2										
S21-170/ S20-045B	40,000	21.1	405	1450	80,000	65,000	55,000	3.07	5.57	
S21-190/ S20-045B	40,000	22.0	485	1650	100,000	85,000	70,000	3.07	5.57	
Tandem Axles										
DS344	34,000	19.7	430	1550	90,000	90,000	80,000	3.08	5.57	
DS404	40,000	21.1	485	1650	90,000	90,000	80,000	3.08	5.57	1, 2
D40-145	40,000	19.3	485	1650	80,000	80,000	60,000	3.23	3.91	1
D40-145	40,000	19.3	485	1550/1750	80,000	80,000	60,000	3.23	3.91	1
D40-145	39,000	19.8	485	1650	80,000	70,000	50,000	3.23	3.91	1
D40-145	38,000	20.2	455	1550	80,000	N/A	N/A	3.23	3.91	1, 3
D40-155	40,000	19.8	485	1650	80,000	80,000	80,000	2.26	2.79	1, 2
D40-156	40,000	20.7	485	1650	90,000	85,000	80,000	2.79	3.91	1, 2
D40-156	40,000	20.7	550	1850	80,000	80,000	80,000	2.93	3.91	1
DS405	40,000	21.1	485	1650	90,000	90,000	80,000	3.08	5.57	2
DSH40	40,000	21.1	550	1850	90,000	90,000	80,000	3.08	4.88	
D40-170	40,000	21.1	550	1850	140,000	120,000	100,000	3.07	5.38	
D46-170	46,000	21.1	550	1850	140,000	120,000	100,000	3.07	5.38	
D46-170H	46,000	21.1	550	1850	140,000	120,000	100,000	3.07	5.38	

Note 1: Suspension restrictions may exist with the DS404, D40-145, D40-155 and D40-156. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.

Note 2: When multiple torque engines are specified, a maximum engine torque of 1750 lb-ft can be approved if the higher engine torque is limited to direct and/or overdrive transmission gears.

Note 3: Operation 1 is limited to 6% Grade.



Vocational Description

- Movement of material to, from, and around a job site
- 90% of loaded operation on prepared road surfaces of concrete, asphalt, gravel, crushed rock or hard packed dirt and up to 10% of loaded operation into sandy or muddy work areas
- Lifiable tag and pusher axles are often used to increase legal load capacity on highway
- Vehicles typically operate a high percentage of time off-highway making a large number of stops and starts
- Straight trucks as well as trucks with equipment trailers are considered construction vehicles. Tractor/semi-trailers and trucks pulling material trailers or dump body pups will be considered mining applications and should be reviewed based on guidelines established for that vocation

Typical Vehicle Types

Asphalt Truck	End/Side Dump Truck	Landscaping Truck	Stake Body Truck
Block/Brick Truck	Feed Lot Truck	Milk Tanker Truck	Snowplow/Snowblower
Bucket Truck	Flatbed Truck	Mixer Truck	Tanker Truck
Concrete Pumper	Grain Truck	Roll-Off Container Truck	Transit Mixer
Crane/Cherry Picker	Hook Lift Truck	Silage Truck	Utility Truck

Service Definitions (vocational description applies to all operations)

- Operation 1 GVW/GCW-straight trucks and straight trucks with equipment trailers. Grades up to 12%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

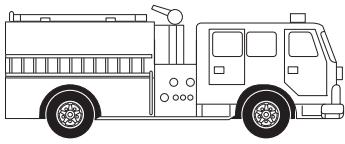
Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S110, S111, S130, S140, 17060S, 19060S, 21060S, 21065T, 22065T, 23083T, 26082T, S23-590, S26-590, S30-590	2 Years / Unlimited Mileage
	S21-170, S21-190, S23-170, S23-190, S23105, S25-190, S26-190, S30-190	3 Years / 350,000 Miles (560,000 km)
Tandem Drive Axles	DS404, DS405	2 Years / Unlimited Mileage
	DSH40, DSH44, D40-170, D46 -170, D50-170	3 Years / Unlimited Mileage
	DT463P, D46-590, D52-190, D52-590, D60-190, D60-590, D70-190, D70-590	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S14-110	13,500	16.5	300	520	23,000	3.73	5.38	
S14-130	13,500	15.7	300	660	25,000	3.73	5.38	
S16-130	15,500	18.1	325	605	25,000	3.73	5.38	
S17-140	17,000	19.7	300	860	29,000	3.58	5.57	
17060S	17,000	19.7	300	860	29,000	3.58	5.57	
S19-140	19,000	19.7	300	860	31,000	3.58	5.57	
19060S	19,000	20.1	300	860	31,000	3.55	5.57	
19055P	19,000	20.1	300	860	31,000	5.32	7.21	
19055T	19,000	20.1	300	860	31,000	3.90/5.32	5.29/7.21	
21060S	21,000	21.1	300	860	33,000	3.55	5.57	
21065P	21,000	21.1	300	860	33,000	5.32	7.21	
21065T	21,000	21.1	300	860	33,000	3.90/5.32	5.29/7.21	
S21-170	21,000	21.1	350	1350	50,000	3.07	5.57	
S21-170E	21,000	21.1	350	1350	50,000	3.07	5.57	
S21-190	21,000	21.1	375	1450	60,000	3.07	5.57	
S21-190E	21,000	21.1	375	1450	60,000	3.07	5.57	
22060S	22,000	21.1	300	860	34,000	3.55	5.57	
22065P	22,000	21.1	300	860	34,000	5.32	7.21	
22065T	22,000	21.1	300	860	34,000	3.90/5.32	5.29/7.21	
23060SH	23,000	19.8	300	860	34,000	3.55	5.57	
23082T	23,000	22.0	310	1150	50,000	3.70/5.04	5.43/7.39	
S23-170	23,000	22.0	350	1350	50,000	3.07	5.57	
S23-170E	23,000	22.0	350	1350	50,000	3.07	5.57	
S23-190	23,000	22.0	375	1450	60,000	3.07	5.57	
S23-190E	23,000	22.0	375	1450	60,000	3.42	5.57	
S23-590	23,000	22.0	375	1450	60,000	4.75	7.30	
S25-170	25,000	22.0	350	1350	50,000	3.07	5.57	
S25-170E	25,000	22.0	350	1350	50,000	3.07	5.57	
26082T	26,000	22.0	310	1150	50,000	3.70/5.04	5.43/7.39	
S26-190	26,000	22.0	375	1450	60,000	3.42	5.57	
S26-190E	26,000	22.0	375	1450	60,000	3.42	5.57	
S26-590	26,000	22.0	375	1450	60,000	4.75	6.65	
S30-190	30,000	22.7	375	1450	60,000	3.42	5.57	
S30-190E	30,000	22.7	375	1450	60,000	3.42	5.57	
S30-590	30,000	22.7	375	1450	60,000	4.75	6.65	
S35-590	35,000	22.7	375	1450	60,000	4.75	6.65	

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Tandem Axles								
DS405	40,000	21.1	375	1450	66,000	3.55	5.57	
DSH40	40,000	21.1	485	1650	70,000	3.55	4.88	
D40-170	40,000	21.1	625	2050	100,000	3.42	5.38	
DSH44	44,000	21.1	485	1650	72,000	3.55	5.29	
DT463-P	46,000	22.0	600	1850	100,000	3.70/5.04	4.88/6.64	
D46-170	46,000	22.0	625	2050	100,000	3.42	5.38	1
D46-170H	46,000	22.0	625	2050	100,000	3.42	5.38	
D46-590HP	46,000	22.0	625	2050	110,000	4.75	7.75	
D50-170	50,000	22.0	625	2050	100,000	3.42	4.56	
D52-190P	52,000	22.0	625	2050	110,000	3.42	5.57	
D52-590P	52,000	22.0	625	2050	110,000	4.75	7.75	
D60-190P	60,000	22.7	625	2050	110,000	3.42	4.56	
D60-590P	60,000	22.7	625	2050	110,000	4.75	7.75	
D70-590P	70,000	22.7	625	2050	110,000	4.75	7.75	
Tridem Axles								
T60-174P	Note 2	19.7	485	1650	80,000	3.90	4.63	2
TD583-P	Note 2	20.1	600	1850	100,000	3.90/5.32	4.88/6.64	2
T69-170HP	Note 2	20.8	625	2050	100,000	3.91	4.78	2
T78-190P	Note 2	20.8	625	2050	110,000	3.91	4.78	2
T78-590P	Note 2	20.8	625	2050	110,000	4.75	7.30	2

Note 1: Suspension restrictions may exist with the D46-170. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.

Note 2: Allowable tridem gross axle weight rating (GAWR) varies with axle ratio. Refer to the Tridem Load Ratings Section for information regarding permissible gross axle weight ratings, page 59.



Vocational Description

- Vehicles used to transport people and equipment for the purpose of extinguishing fires or ambulance service
- 90% of operation on prepared road surfaces of concrete, asphalt, gravel, crushed rock or hard packed dirt and up to 10% of loaded operation into sandy or muddy work areas
- Mileage is typically under 15,000 miles per year
- Typical vehicle routes are three (3) miles between start and stop
- Vehicle retarders (engine, exhaust, transmission or electromagnetic) are common
- High engine horsepower and automatic transmissions are typical
- Loaded 100% of the time

Typical Vehicle Types

Aerial Ladders	Emergency Vehicle Non-pumper	Foam Tender Truck	Tankers
Aerial Platforms	Fire Truck	Hazardous Material	
Ambulances	First Responder Truck	Pumpers	

Service Definitions (vocational description applies to all operations)

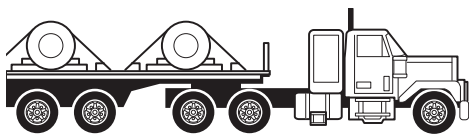
- Operation 1 GVW-straight trucks. Grades up to 20%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S110, S111, S130, S140, 17060S, 19060S	2 Years / Unlimited Mileage
	21060S, S21-170, S21-190, 22060S, S23-170, S23-190, 23105S, S25-190, S26-190, S30-190	3 Years / 350,000 Miles (560,000 km)
Tandem Drive Axles	DS404, DS405	2 Years / Unlimited Mileage
	DSH41, DSH44, D40-170, D46 -170, D50-170, D52-190, D60-190	3 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	2 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW) Operation 1 20% Grade	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S14-110	13,500	16.5	330	550	24,500	3.73	5.13	
S14-130	13,500	15.7	300	660	26,500	3.73	5.13	
S16-130	15,500	18.1	330	605	26,500	3.73	5.13	
S17-140	17,000	19.7	300	860	27,000	3.58	5.57	
17060S	17,000	19.7	330	950	27,000	3.25	5.57	
S19-140	19,000	19.7	300	860	31,000	3.58	5.57	
19060S	19,000	20.1	330	950	31,000	3.25	5.57	
21060S	22,000	21.1	330	950	34,000	3.25	5.57	
S21-170	22,000	21.1	450	1450	45,000	3.07	5.57	
S21-170E	22,000	21.1	450	1450	45,000	3.07	5.57	
S21-190	22,000	21.1	525	1650	45,000	3.07	6.14	
S21-190E	22,000	21.1	525	1650	45,000	3.42	6.14	
22060S	22,000	21.1	330	950	34,000	3.25	5.57	
23060SH	23,000	19.8	330	950	34,000	3.25	5.57	
S23-170	23,000	22.0	450	1450	45,000	3.07	5.57	
S23-170E	23,000	22.0	450	1450	45,000	3.07	5.57	
S23-190	24,000	22.0	525	1650	46,000	3.07	6.14	
S23-190E	24,000	22.0	525	1650	46,000	3.42	6.14	
S25-170	26,000	22.0	450	1450	48,000	3.07	5.57	
S25-170E	26,000	22.0	450	1450	48,000	3.07	5.57	
S26-190	27,000	22.0	525	1650	49,000	3.42	6.14	
S26-190E	27,000	22.0	525	1650	49,000	3.42	6.14	
S30-190	31,000	22.7	525	1650	53,000	3.42	6.14	
S30-190E	31,000	22.7	525	1650	53,000	3.42	6.14	
S30-590	31,000	22.7	525	1650	53,000	4.75	6.65	
S35-590	35,000	22.7	525	1650	58,000	4.75	6.65	
Tandem Axles								
DS404	40,000	21.1	500	1550	62,000	3.25	5.57	1
DS405	42,000	21.1	500	1550	64,000	3.25	5.57	
DSH40	42,000	21.1	550	1850	64,000	3.25	4.88	
D40-170	42,000	21.1	625	2050	64,000	3.21	5.57	
DSH44	45,000	21.1	550	1850	67,000	3.25	5.29	
D46-170	46,000	22.0	625	2050	68,000	3.21	5.57	1
D46-170H	50,000	22.0	625	2050	70,000	3.21	5.57	
D50-170	52,000	22.0	625	2050	72,000	3.21	5.57	
D52-190P	54,000	22.0	625	2050	76,000	3.42	5.38	
D60-190P	60,000	22.7	625	2050	82,000	3.42	5.38	

Note 1: Suspension restrictions may exist with the DS404 and D46-170. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.



Heavy Haul

Vocational Description

- Movement of heavy equipment or materials at legal maximums or special permit loadings
- Exclusive operation on prepared road surfaces of concrete, asphalt, and maintained gravel
- High horsepower engines and auxiliary transmissions are typically used
- Loaded going and empty return
- Infrequent stops

Typical Vehicle Types

Flatbed	Lowboy
Heavy Equipment Transport	Specialized Heavy Haul
Heavy Wrecker	Steel Hauling

Service Definitions (vocational description applies to all operations)

- Operation 1 Grades up to 8%
- Operation 2 Grades up to 12%

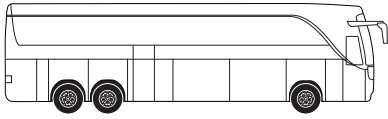
Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Tandem Drive Axles	D40-170, D46 -170, D50-170, T69-170	3 Years / Unlimited Mileage
	DT463P, DT521, D46-590, D52-190, D52-590, D60-190, D60-590, D70-190, D70-590, T78-190, T78-590	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	2 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Heavy Haul

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GCW)		Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 8% Grade	Operation 2 12% Grade	Fastest	Slowest	
Tandem Axles									
DT463-P	46,000	22.0	625	2050	190,000	175,000	3.70/5.04	4.56/6.20	
D46-170H	46,000	22.0	625	2050	200,000	185,000	3.42	4.56	
D46-590HP	46,000	22.0	650	2250	240,000	225,000	4.75	7.30	
D50-170	50,000	22.0	625	2050	200,000	185,000	3.42	4.56	
D52-190P	52,000	22.0	650	2250	240,000	225,000	3.58	4.78	
D52-590P	52,000	22.0	650	2250	240,000	225,000	4.75	7.30	
D60-190P	60,000	22.7	650	2250	240,000	225,000	3.58	4.78	
D60-590P	60,000	22.7	650	2250	240,000	225,000	4.75	7.30	
D70-590P	70,000	22.7	650	2250	240,000	225,000	4.75	7.30	
Tridem Axles									
T60-174P	Note 1	19.7	485	1650	180,000	160,000	3.90	4.63	1
TDT583-P	Note 1	20.1	625	2050	190,000	175,000	3.90/5.32	4.56/6.21	1
T69-170HP	Note 1	20.8	625	2050	200,000	185,000	3.91	4.78	1
T78-190P	Note 1	20.8	650	2250	240,000	225,000	3.91	4.78	1
T78-590P	Note 1	20.8	650	2250	240,000	225,000	4.75	7.30	1

Note 1: Allowable tridem gross axle weight rating (GAWR) varies with axle ratio. Refer to the Tridem Load Ratings Section for information regarding permissible gross axle weight ratings, page 59.



Intercity Coach

Vocational Description

- Transportation of people and, on occasion, light freight between cities and suburban areas
- Exclusive operation on well-maintained paved surfaces
- High mileage operation
- Typical vehicle routes exceed 30 miles between start and stop
- No towed load allowed

Typical Vehicle Types

Cross Country Coach

Tour Coach

Vehicle Configuration

6 x 2 straight coach with fixed tag or pusher axle

Service Definitions (vocational description applies to all operations)

- Operation 1 Grades up to 8%

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	22060S, 23060SH, S23-170, S23-190, S25-170, S26-190	3 Years / Unlimited Mileage
EconoTrek 6X2	S21-170/S20-045B, S21-190/S20-145B	3 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Intercity Coach

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
22060S	22,000	20.7	350	1050	45,000	3.36	4.78	
23060SH	23,000	19.8	350	1050	45,000	3.36	4.78	
S23-170	23,000	21.1	375	1450	55,000	3.42	4.78	
S23-190	23,000	21.1	485	1650	55,000	3.42	4.78	
S25-170	25,000	21.1	375	1450	55,000	3.42	4.78	
S26-190	26,000	21.1	485	1650	55,000	3.42	4.78	
EconoTrek 6x2								
S21-170/ S20-045B	40,000	21.1	375	1450	55,000	3.42	4.78	
S21-190/ S20-145B	40,000	21.1	485	1650	55,000	3.42	4.78	



Vocational Description

- Long distance transport of various types of freight in high mileage operation (min. 60,000 miles/year)
- Exclusive operation on road surfaces of good to excellent concrete or asphalt
- Vehicle routes are typically on limited access highways and exceed 30 miles between starts and stops
- Limited secondary road usage (5% max.)
- Maximum infrequent grades of up to 8%
- Majority of vehicles are 4x2, 6x2 (fixed tag or pusher) and 6x4 tractor/trailer combination and some straight trucks

Typical Vehicle Types

Auto Haulers	General Freight	Lumber Haulers	Refuse/On-Highway Trailer
Bulk Haulers	Grain Haulers	Moving Van	Tanker Trailer
Double Trailers	Hay Haulers	Pipe Hauler	Triple Trailers
Flatbed Trailers	Livestock Haulers	Refrigerated Freight	Van Trailer

Service Definitions (vocational description applies to all operations)

- Operation 1 Grades up to 3%
- Operation 2 Grades up to 8%

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

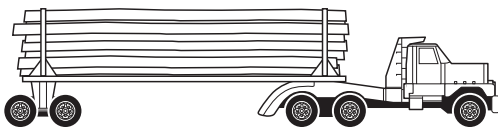
Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	21060S, 22060S, S21-170, S23-170, S23-190, S26-190	5 Years / 750,000 Miles (1,200,000 km)
Tandem Drive Axles	D40-145, D40-155, D40-156, DS404, DS405, DSP40, DSP41, DST40, DST41, DSH40, DSH44, D40-170, D46-170, T69-170	5 Years / 750,000 Miles (1,200,000 km)
EconoTrek 6X2	S21-170/S20-045B, S23-170/S20-045B, S23-190 / S20-045B	5 Years / 750,000 Miles (1,200,000 km)
Non-Driving Steer Axles	E1002I, E1002W, E1202I, E1202W, E1203I, E1322I, E1322W, E1462I, E1462W	5 Years / 750,000 Miles (1,200,000 km) [Tie rod ends, king pins, & bushings limited to 3 Years / 350,000 Miles (560,000 km)]
	All Other Steer Axle Models	5 Years / 750,000 Miles (1,200,000 km) [(Tie rod ends limited to 1 Year / 125,000 Miles (200,000 km)) [King pins & bushings limited to 3 Years / 350,000 Miles (560,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers w/ Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
LMS Hubs	Steer, Drive and Trailer	3 Years / 350,000 Miles (560,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)		Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 3% Grade	Operation 2 8% Grade	Fastest	Slowest	
Single Axles									
21060S	21,000	21.1	300	860	60,000	60,000	3.08	4.63	
S21-170	21,000	21.1	405	1450	100,000	90,000	3.07	4.56	
S21-170	21,000	19.8	485	1650	90,000	80,000	3.07	4.10	1
S21-190	21,000	22.0	485	1650	140,000	110,000	3.07	4.56	
S21-190	21,000	20.1	550	1850	100,000	80,000	2.93	4.30	
S21-190	21,000	19.6	455	1650	90,000	80,000	2.53	2.87	1
S21-190	20,000	19.3	415	1450/1650	N/A	105,000	2.53	2.87	
S21-190	20,000	18.9	455	1550/1750	N/A	105,000	2.53	2.87	
22060S	22,000	21.1	300	860	60,000	60,000	3.08	4.63	
23060SH	23,000	19.8	300	860	60,000	60,000	3.08	4.63	
S23-170	23,000	21.1	405	1450	100,000	90,000	3.07	4.56	
S23-170	23,000	19.3	485	1650	90,000	80,000	3.07	4.10	
S23-190	23,000	22.0	485	1650	140,000	110,000	3.07	4.56	
S23-190	23,000	19.8	550	1850	100,000	80,000	2.93	4.30	
S23-190	23,000	19.1	455	1650	90,000	80,000	2.53	2.87	1
S23-190	23,000	18.9	415	1450/1650	N/A	105,000	2.53	2.87	
EconoTrek 6x2									
S21-170/ S20-045B	40,000	21.1	405	1450	100,000	90,000	3.07	4.56	
S21-170/ S20-045B	40,000	19.8	485	1650	90,000	80,000	3.07	4.10	1
S21-190/ S20-045B	40,000	22.0	485	1650	140,000	110,000	3.07	4.56	
S21-190/ S20-045B	40,000	20.1	550	1850	100,000	80,000	2.93	4.30	
S21-190/ S20-045B	40,000	19.6	455	1650	90,000	80,000	2.53	2.87	1
S21-190/ S20-045B	40,000	19.3	415	1450/1650	N/A	105,000	2.53	2.87	
S23-170/ S20-045B	40,000	21.1	405	1450	100,000	90,000	3.07	4.56	
S23-170/ S20-045B	40,000	19.8	485	1650	90,000	80,000	3.07	4.10	1
S23-190/ S20-045B	40,000	22.0	485	1650	140,000	110,000	3.07	4.56	
S23-190/ S20-045B	40,000	20.1	550	1850	100,000	80,000	2.93	4.56	
S23-190/ S20-045B	40,000	19.6	455	1650	90,000	80,000	2.53	2.87	1
S23-190/ S20-045B	40,000	19.3	415	1450/1650	N/A	105,000	2.53	2.87	
Tandem Axles									
DS344	34,000	19.7	430	1550	90,000	90,000	3.08	4.11	
DS404	40,000	21.1	500	1650	143,000	110,000	3.08	4.11	1, 2
DS404	40,000	19.7	550	1850	80,000	80,000	3.08	4.11	2
DS404	40,000	18.9	455	1550/1750	80,000	80,000	2.64	2.93	2
D40-145	40,000	19.3	485	1650	110,000	80,000	3.23	3.91	1, 2
D40-145	39,000	19.8	485	1650	100,000	80,000	3.23	3.91	1, 2
D40-145	38,000	20.2	485	1650	90,000	80,000	3.23	3.91	1, 2, 3
D40-155	40,000	19.8	485	1650	80,000	80,000	2.26	2.79	1, 2
D40-156	40,000	21.1	500	1650	145,000	110,000	2.79	3.91	1, 2
D40-156	40,000	21.1	550	1850	80,000	80,000	2.93	3.91	2
DS405	40,000	21.1	500	1650	143,000	110,000	3.08	4.11	1
DS405	40,000	19.7	550	1850	80,000	80,000	3.08	4.11	
DS405	40,000	18.9	455	1550/1750	80,000	80,000	2.64	2.93	
DSH40	40,000	21.1	600	2050	143,000	110,000	3.08	4.88	
D40-170	40,000	21.1	625	2050	185,000	160,000	3.07	4.10	
D46-170	46,000	21.1	650	2250	185,000	160,000	3.07	4.10	
D46-170H	46,000	21.1	650	2250	185,000	160,000	3.07	4.10	

Note 1: When engines with multiple torque outputs are specified, a maximum engine torque of 1750 lb-ft can be approved if limited to direct and overdrive transmission gears only.

Note 2: Suspension restrictions may exist with the DS404, D40-145, D40-155 and D40-156. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.

Note 3: Operation 2 is limited to 6% maximum grade.



Vocational Description

- Movement of logs, chips and pulp between logging sites, mills or processing plants
- High horsepower engines and vehicle retarders are typically used
- Vehicle routes are typically 3 to 30 miles between starts and stops
- Fully loaded going and empty return
- Majority of vehicles are 6x4 tractor/trailer combination or trucks with full trailers unique to this vocation

Typical Vehicle Types

Chip Hauler	Log Hauler	Straight Truck with Trailer
Divorced Hauler	Pole Truck & Trailer	Tractors with Pole Trailers

Service Definitions (vocational description applies to all operations)

- Operation 1 Exclusive operation on road surfaces of concrete or asphalt. Grades not exceeding 8%.
- Operation 2 Infrequent grades up to 12%. 90% of loaded operation on prepared road surfaces of concrete, asphalt, gravel, crushed rock, or hard packed dirt with up to 10% of loaded operation into sandy or muddy job sites.
- Operation 3 Infrequent grades up to 20%. 90% of loaded operation on prepared road surfaces of concrete, asphalt, gravel, crushed rock, or hard packed dirt with up to 10% of loaded operation into sandy or muddy job sites.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

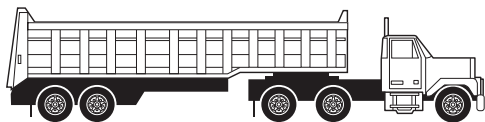
Component	Axle Model (Family)	Standard Warranty
Tandem Drive Axles	DSH41, D40-170, D46 -170, D50-170, T69-170	3 Years / Unlimited Mileage
	DT463P, DT521, D46-590, D52-190, D52-590, D60-190, D60-590, D70-190, D70-590, T78-190, T78-590, TDT583	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)			Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 8% Grade	Operation 2 12% Grade	Operation 3 20% Grade	Fastest	Slowest	
Tandem Axles										
DS405	40,000	21.1	485	1650	80,000	N/A	N/A	3.36	4.88	
DSH40	40,000	21.1	550	1850	100,000	N/A	N/A	3.36	4.33	
D40-170	40,000	21.1	625	2050	160,000	150,000	135,000	3.42	4.78	
DT463-P	46,000	22.0	600	1850	150,000	140,000	130,000	3.70/5.04	4.88/6.64	
D46-170H	46,000	22.0	625	2050	160,000	150,000	135,000	3.42	4.78	
D46-590HP	46,000	22.0	625	2050	180,000	170,000	160,000	4.75	7.30	
D50-170	50,000	22.0	625	2050	160,000	150,000	135,000	3.42	4.78	
D52-190P	52,000	22.0	625	2050	180,000	170,000	160,000	3.42	4.78	
D52-590P	52,000	22.0	625	2050	180,000	170,000	160,000	4.75	7.30	
D60-190P	60,000	22.7	625	2050	180,000	170,000	160,000	3.42	4.78	
D60-590P	60,000	22.7	625	2050	180,000	170,000	160,000	4.75	7.30	
D70-590P	70,000	22.7	625	2050	180,000	170,000	160,000	4.75	7.30	

Tridem Axles

T60-174P	Note 1	19.7	485	1650	120,000	110,000	100,000	3.90	4.63	1
TDT583-P	Note 1	20.1	600	1850	150,000	140,000	130,000	3.90/5.32	4.88/6.64	1
T69-170HP	Note 1	20.8	625	2050	160,000	150,000	135,000	3.91	4.78	1
T78-190P	Note 1	20.8	625	2050	180,000	170,000	160,000	3.91	4.78	1
T78-590P	Note 1	20.8	625	2050	180,000	170,000	160,000	4.75	7.30	1

Note 1: Allowable tridem gross axle weight rating (GAWR) varies with axle ratio. Refer to the Tridem Load Ratings Section for information regarding permissible gross axle weight ratings.



Vocational Description

- Movement of rock, ore, gravel and minerals around mine sites and between mines and processing plants
- High horsepower engines are typically used in this vocation
- Vehicle routes are typically 3 to 30 miles between starts and stops
- 90% of operation on road with up to 10% into sandy or muddy job sites
- Fully loaded going and empty return
- Tractor/trailer and straight truck/material trailer combinations are considered mining vehicles. Straight trucks without trailers or trucks with equipment trailers are considered construction applications and should be reviewed based on the guidelines established for that vocation.

Typical Vehicle Types

Belly/Bottom Dump Trailer	Michigan Special Gravel Trains	Side/Semi-End Dump Trailer
Hopper Trailer Combinations	Ore Hauling Trailer	Super/Transfer Dump

Service Definitions (vocational description applies to all operations)

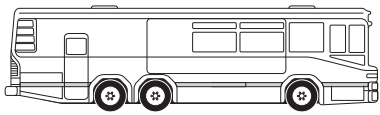
- Operation 1 Exclusive tractor/trailer or truck and material trailer operation on prepared road surfaces of concrete, asphalt, gravel, crushed stone, or hard packed dirt. Grades of up to 8%.
- Operation 2 Tractor/trailer or truck and material trailer operation on prepared road surfaces of concrete, asphalt, gravel, crushed stone, or hard packed dirt with up to 10% of the total operation going into sandy or muddy mine sites. Grades of up to 20%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S23-170, S23-190	2 Years / Unlimited Mileage
Tandem Drive Axles	DSH41, DT463, D40-170, D46 -170, D50-170, T69-170, D46-590, D52-190, D52-590, D60-190, D60-590, D70-590, TDT583, T78-190, T78-590	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	2 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GCW)		Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 8% Grade	Operation 2 20% Grade	Fastest	Slowest	
Single Axles									
S23-170	23,000	19.9	405	1450	65,000	N/A	3.90	4.56	
S23-190	23,000	21.1	485	1650	80,000	N/A	3.73	4.56	
Tandem Axles									
DS405	40,000	21.1	485	1650	80,000	N/A	3.36	4.88	
DSH40	40,000	21.1	550	1850	80,000	N/A	3.36	4.88	
D40-170	40,000	21.1	625	2050	165,000	140,000	3.42	4.56	
DT463-P	46,000	22.0	600	1850	165,000	130,000	3.70/5.04	4.88/6.64	
D46-170H	46,000	22.0	625	2050	165,000	140,000	3.42	4.56	
D46-590HP	46,000	22.0	625	2050	180,000	160,000	4.75	6.65	
D50-170	50,000	22.0	625	2050	165,000	140,000	3.42	4.56	
D52-190P	52,000	22.0	625	2050	180,000	160,000	3.42	4.78	
D52-590P	52,000	22.0	625	2050	180,000	160,000	4.75	6.65	
D60-190P	60,000	22.7	625	2050	180,000	160,000	3.42	4.78	
D60-590P	60,000	22.7	625	2050	180,000	160,000	4.75	6.65	
D70-590P	70,000	22.7	625	2050	180,000	170,000	4.75	6.65	
Tridem Axles									
T60-174P	Note 1	19.7	485	1650	120,000	100,000	3.90	4.63	1
TDT583-P	Note 1	20.1	600	1850	165,000	130,000	3.90/5.32	4.88/6.64	1
T69-170HP	Note 1	20.8	625	2050	165,000	140,000	3.91	4.78	1
T78-190P	Note 1	20.8	625	2050	180,000	160,000	3.91	4.78	1
T78-590P	Note 1	20.8	625	2050	180,000	160,000	4.75	7.30	1

Note 1: Allowable tridem gross axle weight rating (GAWR) varies with axle ratio. Refer to the Tridem Load Ratings Section for information regarding permissible gross axle weight ratings.



Vocational Description

- Vehicles generally used for non-commercial transportation and as traveling domiciles for family
- Loaded full time
- May pull small passenger car, boat, or pickup truck
- Typical vehicle routes exceed 30 miles between starts and stops
- Annual mileage generally less than 30,000
- Typical operation is on paved roads and short distances within campgrounds and parks
- Equipped with automatic transmissions

Typical Vehicle Types

Integral Coach Recreational Vehicles

Vehicle Configurations

Straight coach type vehicles with towing ability:

4x2 straight coach

6x2 (with fixed tag or pusher axles)

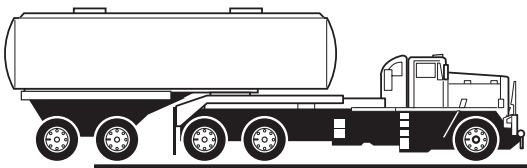
Service Definitions (vocational description applies to all operations)

- Operation 1 Loaded full time. Infrequent grades up to 8%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S110, S111, S130, S140, 17060S, 19060S	2 Years / Unlimited Mileage
	21060S, S20-140, S21-140, S21-170, S21-190, 22060S, 23060SH, S23-170, S23-190	3 Years / Unlimited Mileage
EconoTrek 6X2	S21-170/S20-045B, S23-170/S20-045B, S23-190/S20-045B	3 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW) Operation 1 8% Grade	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S14-110	13,500	16.5	300	605	27,500	4.10	5.38	
S16-130	15,500	18.1	300	660	30,000	4.10	5.38	
S17-140	17,000	19.7	300	860	40,000	3.58	5.57	
17060S	17,000	19.7	300	860	40,000	3.55	5.57	
S19-140	19,000	19.7	300	860	42,000	3.58	5.57	
19060S	19,000	19.7	300	860	42,000	3.55	5.57	
S20-140	20,000	19.7	300	860	42,000	3.58	5.57	
S21-140	21,000	19.7	300	860	42,000	3.58	5.57	
21060S	21,000	20.1	330	1050	44,000	3.55	5.57	
S21-170	21,000	20.1	405	1550	50,000	3.58	5.57	
S21-190	21,000	20.1	485	1750	65,000	3.58	5.57	
22060S	22,000	20.1	330	1050	45,000	3.55	5.57	
23060SH	23,000	19.6	330	1050	45,000	3.55	5.57	
S23-170	23,000	20.1	405	1550	50,000	3.58	5.57	
S23-190	23,000	20.1	485	1750	65,000	3.58	5.57	
EconoTrek 6x2								
S21-170/ S20-045B	40,000	20.1	405	1550	60,000	3.07	5.57	
S21-190/ S40-145B	40,000	20.1	485	1750	70,000	3.07	5.57	



Vocational Description

- Movement of production-related products, supplies and tools between job sites
- Movement of processing equipment and laboratories on job sites
- Low mileage operations on road surfaces made of concrete, asphalt, maintained gravel, crushed rock or hard packed dirt
- High horsepower engines common
- Vehicles are typically 6x4 or 6x6 straight trucks or tractors with permanently mounted equipment for well servicing or exploration

Typical Vehicle Types

Cementing Vehicle	Fracturing Truck	Tanker
Demolition	Geophysical Exploration	Well Serving Truck
Drill Rig	Rigging Truck	Winch Truck

Service Definitions (vocational description applies to all operations)

- Operation 1 Up to 25% job site operation, minimum 3 miles between stops, exclusive operation on prepared road surfaces. Grades up to 12%.
- Operation 2 Full-time job site operation, frequent starts and stops, fully loaded going and empty return, low mileage. Grades up to 12%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

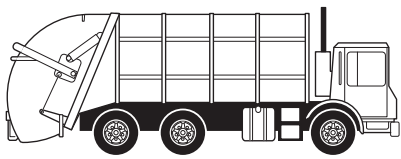
Component	Axle Model (Family)	Standard Warranty
Tandem Drive Axles	DSH44, D40-170, D46 -170, D50-170, T69-170	3 Years / Unlimited Mileage
	DT463P, DT521, D46-590, D52-190, D52-590, D60-190, D60-590, D70-190, D70-590, T78-190, T78-590	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	2 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)		Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 12% Grade	Operation 2 12% Grade	Fastest	Slowest	
Tandem Axles									
DS405	40,000	21.1	375	1450	100,000	N/A	3.55	5.29	
DSH40	40,000	21.1	485	1650	100,000	N/A	3.55	4.88	
D40-170	40,000	21.1	625	2050	120,000	100,000	3.42	5.38	
DSH44	44,000	21.1	485	1650	72,000	72,000	3.55	5.29	3
DT463-P	46,000	22.0	600	1850	120,000	100,000	3.70/5.04	4.88/6.64	
D46-170	46,000	22.0	625	2050	120,000	100,000	3.42	5.38	1
D46-170H	46,000	22.0	625	2050	120,000	100,000	3.42	5.38	
D46-590HP	46,000	22.0	625	2050	140,000	120,000	4.75	6.65	
D50-170	50,000	22.0	625	2050	120,000	100,000	3.42	5.38	
D52-190P	52,000	22.0	625	2050	140,000	120,000	3.42	5.38	
D52-590P	52,000	22.0	625	2050	140,000	120,000	4.75	6.65	
D60-190P	60,000	22.7	625	2050	140,000	120,000	3.42	5.38	
D60-590P	60,000	22.7	625	2050	140,000	120,000	4.75	6.65	
D70-590P	70,000	22.7	625	2050	140,000	120,000	4.75	6.65	
Tridem Axles									
T60-174P	Note 2	19.7	450	1650	100,000	80,000	3.90	4.63	2
TD583-P	Note 2	20.1	600	1850	120,000	100,000	3.90/5.32	4.88/6.64	2
T69-170HP	Note 2	20.8	625	2050	120,000	100,000	3.91	4.78	2
T78-190P	Note 2	20.8	625	2050	140,000	120,000	3.91	4.78	2
T78-590P	Note 2	20.8	625	2050	140,000	120,000	4.75	7.30	2

Note 1: Suspension restrictions may exist with the D46-170. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.

Note 2: Allowable tridem gross axle weight rating (GAWR) varies with axle ratio. Refer to the Tridem Load Ratings Section for information regarding permissible gross axle weight ratings.

Note 3: Applies to straight truck only, no combination vehicles.



Refuse

Vocational Description

- 4x2 and 6x4 straight trucks, generally with automatic transmissions, used for residential refuse/recycle pickup
- Typically a high number of stops and starts per mile
- 6x4 straight trucks operating in commercial/industrial pickup with approximately 1 to 3 miles between stops
- 6x4 tractor/semi-trailers or 6x4 straight trucks with roll-off containers used for transfer/relocation of material. Stops are typically more than 10 miles apart
- 90% of loaded operation on road surfaces of concrete, asphalt or maintained gravel and up to 10% of loaded operation into landfill, transfer or recycling sites

Typical Vehicle Types

Front/Rear/Side Loading	Residential/Commercial Pickup	Scrap Truck	Street Sweeper
Liquid Waste Hauler	Roll-Off Container Truck	Sewer/Septic/Vacuum	Transfer Vehicle

Service Definitions (vocational description applies to all operations)

- Operation 1 GVW – Straight truck vehicles used for residential and commercial pickup of refuse and recyclables. Grades up to 20%.
- Operation 2 GVW/GCW – Straight trucks with roll-off containers and tractor/semi-trailers used to transport material to transfer stations, recycling facilities, or landfill sites. Grades up to 8%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	19060S, 21060S, 21065T, 22060S, 22065T, 22082T, 23083T, 23060SH, S23-190, S26-190, 26082T, S23-590, S26-590, S30-190, S30-590	2 Years / Unlimited Mileage
	S21-170, S23-170, S25-170	3 Years / Unlimited Mileage
Tandem Drive Axles	DS405	2 Years / Unlimited Mileage
	DSH40, DSH44, D40-170, D46 -170, D50-170	3 Years / Unlimited Mileage
	DT463P, D46-590, D52-190, D52-590, D60-190, D60-590, D70-190, D70-590	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Inflation and Monitor System (TIMS)	All Models	3 Years / 300,000 Miles (480,000 km)
Tire Pressure Monitoring System (TPMS)	All Models	3 Years / Unlimited Mileage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

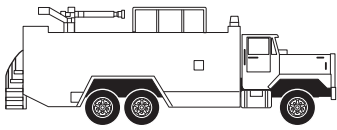
Refuse

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW/GCW)		Gear Ratios		Notes
			HP	Torque (lb-ft)	Operation 1 20% Grade	Operation 2 8% Grade	Fastest	Slowest	
Single Axles									
21060S	21,000	21.1	275	860	33,000		3.55	5.57	1
21065P	21,000	21.1	275	860	33,000		5.32	7.60	1
21065T	21,000	21.1	275	860	33,000		3.90/5.32	5.29/7.21	1
S21-170	21,000	21.1	310	1150	45,000		3.55	5.57	
S21-190	21,000	22.0	375	1450	55,000		3.42	5.57	
22060S	22,000	21.1	275	860	33,000		3.55	5.57	1
22065P	22,000	21.1	275	860	33,000		5.32	7.60	1
22065T	22,000	21.1	275	860	33,000		3.90/5.32	5.29/7.21	1
23060SH	23,000	20.2	275	860	33,000		3.55	5.57	
23082T	23,000	22.0	310	1150	45,000		3.70/5.04	4.88/6.64	
S23-170	23,000	22.0	310	1150	45,000		3.42	5.57	
S23-170E	23,000	22.0	310	1150	45,000		3.42	5.57	
S23-190	23,000	22.0	375	1450	55,000		3.42	5.57	
S23-190E	23,000	22.0	375	1450	55,000		3.42	5.57	
S23-590	23,000	22.0	375	1450	55,000		4.75	6.65	
S25-170	25,000	22.0	310	1150	45,000		3.42	5.57	
S25-170E	25,000	22.0	310	1150	45,000		3.42	5.57	
26082T	26,000	22.0	310	1150	46,000		3.70/5.04	4.88/6.64	
S26-190	26,000	22.0	375	1450	58,000		3.42	5.57	
S26-190E	26,000	22.0	375	1450	58,000		3.42	5.57	
S26-590	26,000	22.0	375	1450	58,000		4.75	6.65	
S30-190	30,000	22.7	375	1450	58,000		3.42	5.57	
S30-190E	30,000	22.7	375	1450	58,000		3.42	5.57	
S30-590	30,000	22.7	375	1450	58,000		4.75	6.65	
S35-590	35,000	22.7	375	1450	58,000		4.75	6.65	
Tandem Axles									
DS405	40,000	21.1	375	1450	N/A	110,000	3.36	5.57	2
DSH40	40,000	21.1	485	1650	N/A	110,000	3.36	4.88	2
D40-170	40,000	21.1	625	2050	60,000	165,000	3.42	5.57	
DSH44	44,000	21.1	485	1650	64,000	N/A	3.36	5.29	
DT463-P	46,000	22.0	600	1850	66,000	155,000	3.70/5.04	4.88/6.64	
D46-170	46,000	22.0	625	2050	66,000	165,000	3.42	5.57	3
D46-170H	46,000	22.0	625	2050	66,000	165,000	3.42	5.57	
D46-590HP	46,000	22.0	625	2050	66,000	175,000	4.75	6.65	
D50-170	50,000	22.0	625	2050	70,000	165,000	3.42	5.57	
D52-190P	52,000	22.0	625	2050	72,000	175,000	3.42	5.25	
D52-590P	52,000	22.0	625	2050	72,000	175,000	4.75	6.65	
D60-190P	60,000	22.7	625	2050	80,000	175,000	3.42	5.25	
D60-590HP	60,000	22.7	625	2050	80,000	175,000	4.75	6.65	

Note 1: The 21060S, 21065P, 21065T, 22060S, 22065P, and 22065T are not approved in vehicles equipped with retarders.

Note 2: The DS405 and DSH40 are not approved for house-to-house pickup, residential refuse applications.

Note 3: Suspension restrictions may exist with the D46-170. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.



Vocational Description

- Specialized all-wheel drive vehicles designed for rapid acceleration to airport crash sites
- Operation on road surfaces made of concrete, asphalt, maintained gravel, crushed rock, hard packed dirt, or other similar surfaces for 90% of the total miles and sandy or muddy crash sites for the remaining 10%
- Extremely low mileage operation
- High horsepower engines and automatic transmissions are typical
- Vehicle retarders are common (engine, transmission, electromagnetic)

Typical Vehicle Types

Airport Rescue Fire (ARF) Crash Fire Rescue (CFR) Emergency Service (EMT) Rapid Intervention Vehicle (RIV)

Vehicle Configuration

4x4 or 6x6 specialized straight trucks

Service Definitions (vocational description applies to all operations)

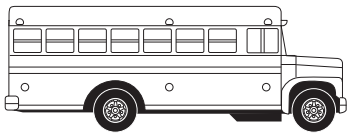
- Operation 1 100% loaded full time. Grades up to 20%.

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S23-170, S23-190, S23-590, S25-170, S26-190, S26-590, S30-190, S30-590	3 Years / Unlimited Mileage
Tandem Drive Axles	D46 -170, D50-170, D52-190, D52-590, D60-190, D60-590	3 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S23-170	23,000	24.5	450	1450	45,000	3.07	5.57	
S23-170E	23,000	24.5	450	1450	45,000	3.07	5.57	
S23-190	24,000	24.5	525	1650	47,000	3.07	5.57	
S23-190E	24,000	24.5	525	1650	47,000	3.42	5.57	
S23-590	24,000	24.5	525	1650	47,000	4.75	6.65	
S25-170	26,000	24.5	450	1450	50,000	3.07	5.57	
S25-170E	26,000	24.5	450	1450	50,000	3.07	5.57	
S26-190	27,000	24.5	525	1650	50,000	3.42	5.57	
S26-190E	27,000	24.5	525	1650	50,000	3.42	5.57	
S26-590	27,000	24.5	525	1650	50,000	4.75	6.65	
S30-190	31,000	24.5	525	1650	54,000	3.42	5.57	
S30-190E	31,000	24.5	525	1650	54,000	3.42	5.57	
S30-590	31,000	24.5	525	1650	54,000	4.75	6.65	
Tandem Axles								
D46-170	46,000	24.5	700	2450	68,000	3.21	4.78	1
D46-170H	50,000	24.5	700	2450	70,000	3.21	4.78	
D50-170	52,000	24.5	700	2450	72,000	3.21	4.78	
D52-190P	54,000	24.5	700	2450	76,000	3.42	4.78	
D52-590P	54,000	24.5	700	2450	76,000	4.75	6.65	
D60-190P	60,000	24.5	700	2450	82,000	3.42	4.78	
D60-590P	60,000	24.5	700	2450	82,000	4.75	6.65	

Note 1: Suspension restrictions may exist with the D46-170. Please consult the Housing Structural Ratings Section for minimum housing box section requirements.



School Bus

Vocational Description

- Transporting students to and from school and/or sponsored events
- Operation on prepared road surfaces of concrete, asphalt, maintained gravel, crushed rock, or hard packed dirt
- 2 stops per mile are considered typical
- Automatic transmissions are typical
- 100% load going / empty return (typical)

Typical Vehicle Types

Front Engine Commercial Chassis

Front Engine Integral Coach

Rear Engine Commercial Chassis

Rear Engine Integral Coach

Shuttle Bus

Vehicle Configuration

4x2 straight bus

Service Definitions (vocational description applies to all operations)

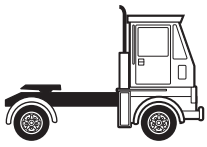
- Operation 1 Grades up to 20%

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S110, S111, S130, S140, 17060S, 19060S, S19-140	2 Year / Unlimited Mileage
	21060S, S20-140, S21-140, S21-170, 22060S, 23060SH, S23-170	3 Years / Unlimited Mileage
Tandem Drive Axles	D46-170H, D50-170, T69-170	3 Years / Unlimited Mileage
	D60-590P, D70-590P, DT463P, D46-590HP, D52-190P, D52-590P, T78-190, T78-590, DTS521P	2 Years / Unlimited Mileage
Non-Driving Steer Axles	All Models	3 Years / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
LMS Hubs	All Models	3 Years / 350,000 Miles (560,000 km)
	Trailers with Approved Semi-Fluid Lubricant	5 Years / 500,000 Miles (800,000 km)

School Bus

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GVW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S14-110	13,500	16.5	225	520	23,000	4.10	5.38	
S16-130	15,500	16.5	275	605	25,000	4.10	5.38	
S17-140	17,000	19.7	300	860	29,000	3.91	5.57	
17060S	17,000	19.7	300	860	29,000	3.90	5.57	
S19-140	19,800	19.7	300	860	31,000	3.91	5.57	
19060S	19,800	20.1	300	860	31,000	3.90	5.57	
S20-140	20,000	19.8	300	860	31,000	3.58	5.57	
S21-140	21,000	19.8	300	860	31,000	3.58	5.57	
21060S	21,000	20.1	300	860	33,000	3.90	5.57	
S21-170	21,000	20.1	310	900	38,000	3.91	6.14	
22060S	22,000	20.1	300	860	34,000	3.90	5.57	
23060SH	23,000	19.3	300	860	34,000	3.90	5.57	
S23-170	23,000	20.1	310	900	38,000	3.91	6.14	



Yard Tractor

Vocational Description

- Transporting trailers on/off vessels, into/out of storage areas, around loading docks
- Operation on prepared road surfaces of concrete, asphalt or maintained gravel
- 6 stops per mile are considered typical
- Annual Mileage: very low
- Restricted Speed (< 25 mph)

Typical Vehicle Types

Port Tractor Rail Yard Spotter Trailer Spotter Yard Jockey

Vehicle Configuration

4x2 tractor 6x4 tractor

Service Definitions (vocational description applies to all operations)

- Operation 1 Grades up to 3%

Warranty Coverage for Vehicles Meeting Vocation Definitions and Application Guidelines

Component	Axle Model (Family)	Standard Warranty
Single Drive Axle	S23-170, S23-190, S30-190, S30-590	1 Year / Unlimited Mileage
Tandem Drive Axles	D40-170, DT463P, D46-170, D50-170, D52-190, D60-190	1 Year / Unlimited Mileage
Non-Driving Steer Axles	All Models	1 Year / Unlimited Mileage [Tie rod end limited to 1 Year / 125,000 Miles (200,000 km)]
Wheel Seal	Standard Wheel Seal	2 Years / 200,000 Miles (320,000 km)
	LMS and Preset	3 Years / 350,000 Miles (560,000 km)
Driveshafts	All Models	Contact OEM for Warranty Coverage
Tire Pressure Control System (TPCS)	All Models	1 Year / Unlimited Mileage

Yard Tractor

Axle Model	Max. GAWR (lbs.)	Max. SLR (in.)	Engine		Max. Gross Weight (lbs.) (GCW)	Gear Ratios		Notes
			HP	Torque (lb-ft)		Fastest	Slowest	
Single Axles								
S23-170	30,000	19.6	300	660	81,000	6.14	7.17	1
S23-190	30,000	19.6	325	660	100,000	6.14	7.17	
S30-190	42,000	19.6	325	660	100,000	6.14	7.17	
S30-590	42,000	19.6	325	660	100,000	7.30	9.97	
Tandem Axles								
DSH40	40,000	19.6	400	1550	125,000	5.57	6.50	
D40-170	40,000	19.6	500	1650	160,000	6.14	7.17	
DT463-P	46,000	19.6	500	1650	160,000	5.43/7.39	6.17/8.40	
D46-170H	46,000	19.6	500	1650	160,000	6.14	7.17	
D50-170	50,000	19.6	500	1650	160,000	6.14	7.17	
D52-190P	52,000	19.6	500	1650	160,000	6.14	7.17	
D60-190P	60,000	19.6	500	1650	160,000	6.14	7.17	

Note 1: .50 in. housing wall thickness and 2.24 in. diameter axle shafts are required.

Dana Service / Aftermarket Parts Warranty Coverage

Warranty

Subject to the conditions stated herein, Dana Commercial Vehicle Product Group of Dana Limited ("Dana") warrants to purchasers of its Spicer® axle and brake parts, components and assemblies ("Products") sold as original equipment ("OE") production or service parts that the Products shall be free from defects in material and workmanship and shall conform to Dana's published specifications under normal use and proper maintenance for the warranty periods described in the "Warranty Periods" section below. This warranty extends to Dana's OE production and service parts customers and their retail customers, and is transferable by the original retail purchaser to one subsequent owner of the vehicle in which the Product was installed as original equipment.

Product parts and components manufactured by others (such as, wheel seals, slack adjusters and tie rods) are warranted solely by their manufacturers and not by Dana.

Dana assumes no responsibility for the selection of any Product for a specific application absent its written approval of such application, and makes no general representations whatever in respect of any such selection.

Remedy

If any Product fails to comply with this warranty during the applicable warranty period, Dana shall reimburse (a) the cost of parts to repair the Product or (b) the cost of a replacement Product, whichever is less, except that for new carrier units, Dana shall reimburse (a) the cost of parts and labor (subject to pre-established prices and rates) to repair the unit or (b) the cost of a replacement unit, whichever is less.

The following are not reimbursable under Dana's warranty: (a) towing expenses, (b) meal and lodging expenses, (c) travel time or transportation expenses, and (d) downtime expenses.

Other exclusions are listed the Dana Commercial Vehicle Warranty Guide and the Dana Commercial Vehicle Warranty Manual. In all cases Dana shall make the final determination as to the appropriate reimbursement for any warranty claim.

Warranty Exclusions

Dana's warranty does not cover normal wear and tear or extend to any Product that has been (a) used in any application contrary to Dana's written recommendations; (b) improperly installed or maintained; (c) altered or modified; (d) damaged by casualty or due to accident, negligence, abuse, or misuse in shipping or use; (e) subjected to abnormal operating conditions; (f) used with any lubricant not approved by Dana; or (g) used with non-Dana repair or replacement parts. All repaired and replacement Products shall be warranted hereunder for the unexpired portion of the original warranty period. (See also Product Specific and General Exclusions listed in the Spicer Warranty Manual.)

Warranty Periods

The product warranty periods (for replacement parts outside of the original warranty period) are as follows, commencing on the date of retail sale:

(a) New carrier exchange units	24 months / unlimited mileage
(b) All other products	12 months / unlimited mileage

If a non-warrantable failure occurs within the standard / extended warranty coverage period, and the customer purchases a new carrier exchange to complete the repair, warranty coverage shall be two years, unlimited mileage, from the date of the new carrier purchase.

If a non-warrantable failure occurs within the standard / extended warranty coverage period, and the customer purchases original replacement parts to complete the repair, warranty coverage shall be one year from date of purchase and unlimited mileage on the replacement parts only. Non-warrantable failures due to abuse or neglect (i.e. overloading, shock load, spin-out, failure to maintain) will void the component warranty.

Claims Procedure

Warranty claims must be made in writing to: Dana Limited, Attention: Commercial Vehicle Warranty Department, 6515 Maumee Western Rd., Maumee, OH 43537.

Dana's obligation to review any warranty claim is subject to the following conditions:

- a. The claim must be submitted as provided above no later than 90 days from the date of the failure and must include the following information: claim number, repair order number, installation date, failure date, mileage at time of failure, explanation of the failure and the repair, identification of the failed Product (including model and serial number), cost of replacement parts, labor hours to complete repair and labor (if applicable), and total amount of claim;
- b. If requested, the Product must be returned, freight collect, to Dana's Warranty Return Centers for examination.
- c. All warranty returns for Commercial Vehicle Axle Division component failures occurring in the USA are to be sent to:
Dana Limited - COTC2, Comm Veh Drive Axle Warr Ret Center, 6515 Maumee Western Rd., Maumee, OH 43537
- e. All failed Driveline Components (U-Joints, Drive-Shafts, Center Bearings, Yokes and Steering Shafts) are to be returned to:
Dana Limited - COTC2, Attn: CVPG Drive-Shaft Warranty, 6515 Maumee Western Rd., Maumee, OH 43537

Dana shall determine that none of the above warranty exclusions apply and that the Product was defective when originally delivered to the purchaser. Dana's determination of warranty coverage shall be final in all cases.

Dana reserves the right to reject a warranty claim for any of the following reasons:

- a. Original claim was filed after 90 days from the date of failure
- b. Failure occurred beyond applicable warranty period
- c. Claim information is insufficient
- d. Product was not returned for inspection as requested
- e. Product inspection does not substantiate claim or indicate a failure

Warranty Disclaimer

DANA'S WARRANTY HEREIN IS EXCLUSIVE AND GIVEN IN PLACE OF (a) ALL OTHER WARRANTIES FOR THE PRODUCTS, EXPRESS, IMPLIED OR STATUTORY, WHETHER WRITTEN OR ORAL, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OR IMPLIED WARRANTIES ARISING FROM PERFORMANCE, COURSE OF DEALING OR USAGE OF TRADE, AND (b) ALL OTHER OBLIGATIONS, LIABILITIES, RIGHTS, CLAIMS OR REMEDIES RESPECTING THE PRODUCTS, INCLUDING, BUT NOT LIMITED TO, ANY RIGHT IN CONTRACT, TORT, OR STRICT LIABILITY AND ANY RIGHT ARISING FROM DANA'S NEGLIGENCE, ACTUAL OR IMPUTED.

LIMITATION OF LIABILITY

DANA'S OBLIGATIONS AND PURCHASER'S REMEDIES HEREIN ARE LIMITED TO THE REIMBURSEMENTS DESCRIBED ABOVE AND DANA SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL, CONSEQUENTIAL AND OTHER DAMAGES, INCLUDING, BUT NOT LIMITED TO, ECONOMIC LOSS, LOST REVENUE, LOST PROFITS, OR LOSS OF USE OR DAMAGE TO OTHER PROPERTY.

Effective Date

This warranty shall become effective and apply to Products sold on or after January 1, 1998, and applies only to Products sold for use in the United States or Canada. This warranty may not be changed, altered or modified in any way except in writing by Dana's authorized representative.

Service Support

Your service and support channel is the Dana Field Marketing network at 1-877-777-5360.

Governing Law

This warranty shall be governed, interpreted and construed by and in accordance with, the internal laws of the State of Ohio and all proceedings to interpret or enforce this warranty shall be brought exclusively in the state or federal court in Ohio with jurisdiction.

Dana Service / Aftermarket Parts Warranty Coverage - U.S. and Canada Only

Warranty coverages for genuine Dana service / aftermarket parts, subcomponents, and complete components are as follows:

Product purchased as service / aftermarket parts, subcomponents, or complete components and installed outside of the warranty coverage period.

- Claims for service/aftermarket parts sold over the counter to a customer will be reimbursed for part(s) warranty.
- Claims for service/aftermarket parts purchased at and installed by an authorized OE dealer will be reimbursed for part(s) and labor.*

Product purchased as service / aftermarket parts, subcomponents, or complete components and installed within of the warranty coverage period. (See exceptions, notes, and definitions below.)

Product Supplied	Warranty Term	Exceptions
Service / Aftermarket Parts	12 Months / Unlimited Mileage (km)	See bulleted notes above
New, Exchange, and Remanufactured Electronics		

* Labor reimbursed for repairs performed per the OEM Approved Channel.

Exceptions

If a non-warrantable failure occurs during the **Original** warranty period (*Standard or Extended*) and the customer purchases genuine Dana service/aftermarket parts to complete the repair; the warranty coverage period of the service/aftermarket parts shall be one year from the date of installation. Remaining parts and subcomponents, which were not replaced at the time of the non-warrantable repair, shall maintain the coverage of the *original* warranty period.

See the Dana Commercial Vehicle Warranty Manual for replacement matrix.

Definitions

Standard Warranty - The base warranty coverage, offered to all purchasers of a product. It is sometimes called, “the OEM warranty period.”

Extended Warranty - Additional coverage, which becomes effective when the Standard warranty period ends. Usually, there are other requirements for eligibility and, in some cases, a service charge must be paid to purchase the coverage.

Original Warranty - The total warranty coverage for which a product is eligible. A combination of the Standard and Extended warranty periods.

Notes

- Warranty coverages for genuine Dana service / aftermarket parts, subcomponents, and complete components commence on the date of retail sale.
- Warranty coverages, stated herein, **apply only** to genuine Dana service / aftermarket parts, subcomponents, and complete components, which are purchased by the customer at normal retail prices.
- To continue warranty coverage, the purchased component model must be the same as the failed component model, unless substitution is authorized by Dana.
- All other Dana warranty exclusions and limitations apply to the coverages stated herein and in the Dana Commercial Vehicle Warranty Manual. Special aftermarket programs and products not listed in this manual have warranty parameters and requirements specified individually per released documentation.

Extended Protection Plan Requirements, Limitations, and Exclusions

- Application for purchased warranty must be made within one (1) year of the in-service date of the vehicle to avoid a late registration fee.
- Vehicles registered beyond the one year limitation are subject to the following late registration fees:
 - Vehicles registered from the 13th month through the 24th month of service require payment of:
 - Single Axle: \$50 USD/\$55 CAD
 - Tandem Axle: \$100 USD/\$115 CAD
 - Clutch: \$50 USD/\$55 CAD
 - Vehicles registered from the 25th month through the 36th month of service require payment of:
 - Single Axle: \$100 USD/\$155 CAD
 - Tandem Axle: \$300 USD/\$340 CAD
 - Warranty coverage for vehicles registered in the 2nd and 3rd year take effect 30 days from the date of registration.
- Extended warranty is only available for the eligible models listed or referenced herein.
- A Spicer approved synthetic lubricant must be used. Lubricant must be changed per Dana prescribed maintenance schedules (Reference Dana publication TCMT0021). Lube change records might be requested for verification purposes.
- Warranty applies exclusively to vehicles licensed and operating in the United States of America or Canada.
- Warranty is transferable to only one subsequent vehicle owner. Warranty is only transferable within the same vehicle vocation. Changing vehicle vocations voids the warranty coverage.
- Re-rating engine torque above the approved torque capacity of the component, voids the warranty coverage. Dealer/ Purchaser shall be responsible for verifying the engine torque does not exceed the torque capacity of the drivetrain.
- Warranty covers parts and labor per Dana established guidelines.
- Oil to water heat exchangers are not covered under the Dana Extended Protection Plans.
- See the Dana Commercial Vehicle Warranty Manual for time and mileage examples and warranty information, requirements, limits, and exclusions.
- Drive Axle Seals (Pinion, Input, Output) limited to 3 years / 350,000 miles.

For complete information on requirements, limitations or exclusions available warranty coverages, warranty claim filing procedures, and authorized repair times, reference the Warranty Manual and the Warranty Guide both available on www.dana.com or contact the Dana Call Center at 1-877-777-5360.

Please refer to www.dana.com for a complete list of Extended Protection Plan options.

For specifying or service assistance, call 1-877-777-5360 or visit our website at www.dana.com/cv

Dana Commercial Vehicle Products Group

3939 Technology Drive
Maumee, Ohio, USA 43537

www.dana.com/cv



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Drivetrain Products

Application Policy

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.