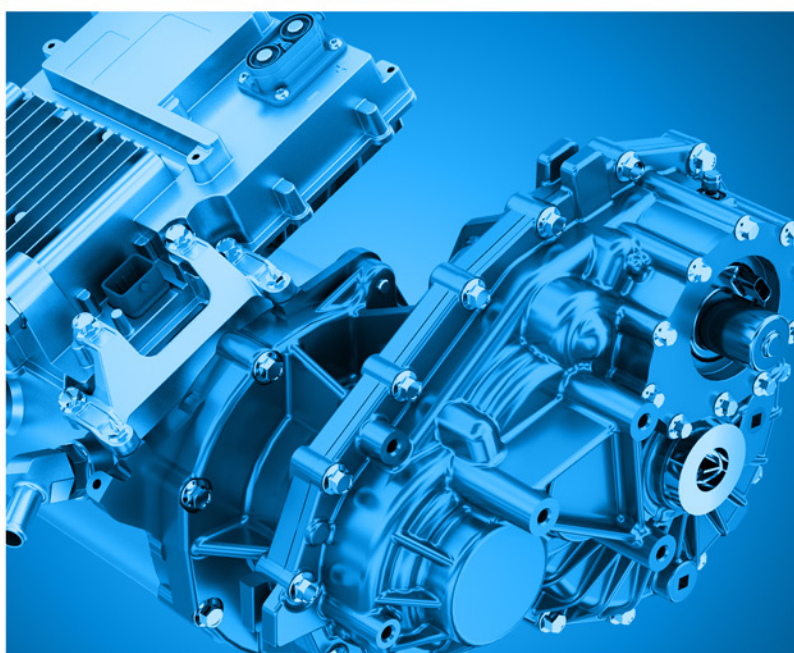
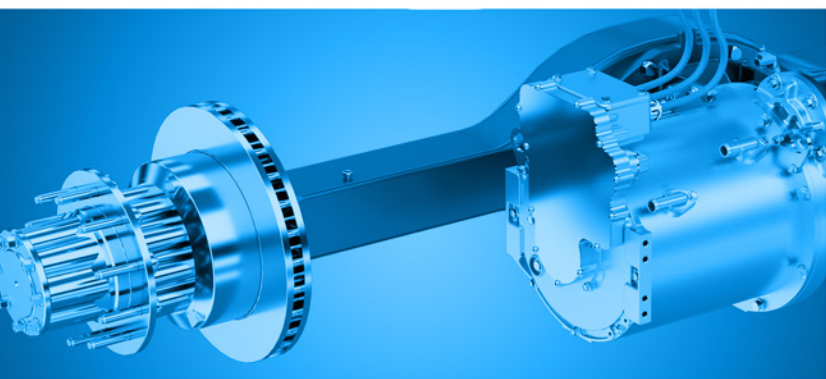
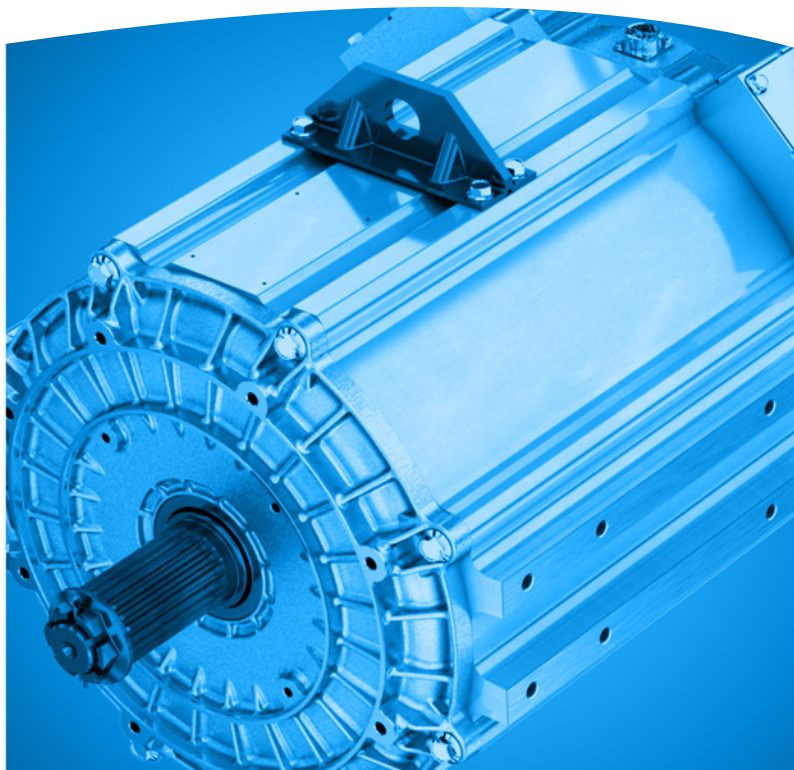
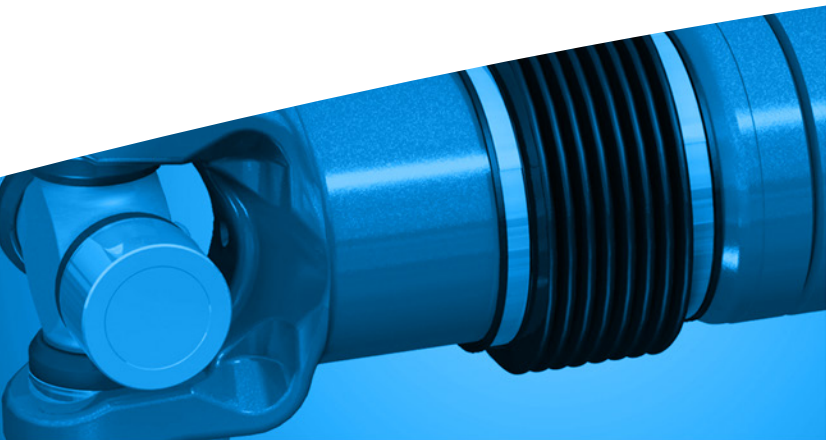


# Spicer® Axle, Driveshaft, and Electrified Systems



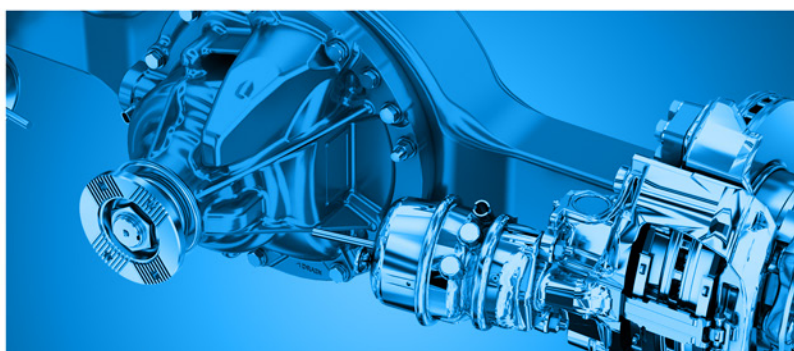
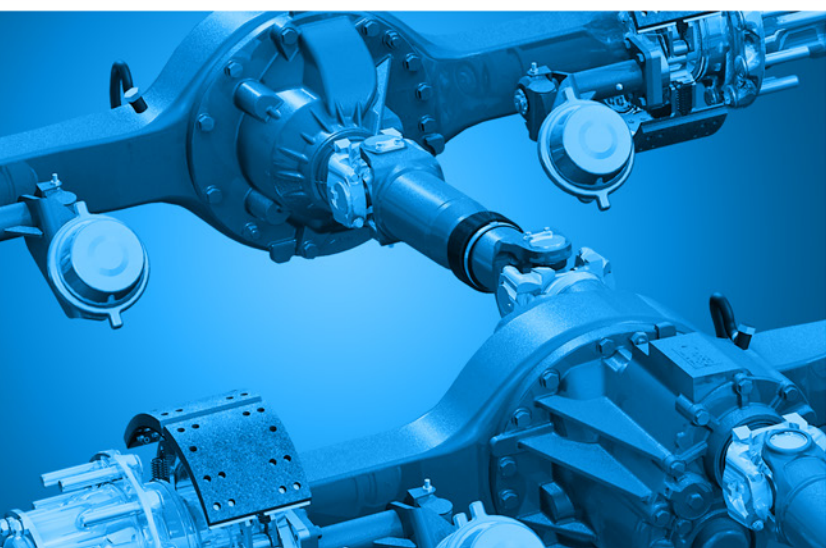
**SPICER®**

*Drivetrain Products*



## Specifications Guide

2020



# Specifications Guide

## Drive Axle

- Introduction . . . . . 1
- Drive Axle: Heavy- and Medium-Duty – General Information . . . . . 2
- Drive Axle: Heavy- and Medium-Duty – Applications . . . . . 3–4
- Drive Axle: Heavy-Duty – Specifications . . . . . 5–7
- Drive Axle: Medium-Duty – Specifications . . . . . 8
- Drive Axle: e-Drive Units and Axles . . . . . 9
- Lubrication Intervals . . . . . 9

## Steer Axle

- Steer Axle: Heavy- and Medium-Duty – General Information . . . . . 10
- Steer Axle: Heavy- and Medium-Duty – Applications . . . . . 11
- Steer Axle: Heavy- and Medium-Duty – Specifications . . . . . 12
- Lubrication Intervals . . . . . 13

## Driveshaft

- Driveshaft: Heavy- and Medium-Duty – General Information . . . . . 14
- Driveshaft: Heavy- and Medium-Duty – Technical Information . . . . . 15
- Spicer Life® Series Heavy-Duty Driveshaft Specifications . . . . . 16–18
- Spicer Life® Series Medium-Duty Driveshaft Specifications . . . . . 19–22
- Lubrication Intervals . . . . . 23

## Electric Products

- Electric Products – General Information . . . . . 24
- Dana TM4® SUMO . . . . . 25 – 26
- Dana TM4® CO150 . . . . . 27
- Dana TM4® CO150-HVF . . . . . 28
- Dana TM4® CO300 Inverter . . . . . 29
- Dana TM4® BCI20 . . . . . 30
- Dana TM4® NEURO 200 . . . . . 31

## Service and Support

- Online Support . . . . . 32
- Warranty Requirements . . . . . 33

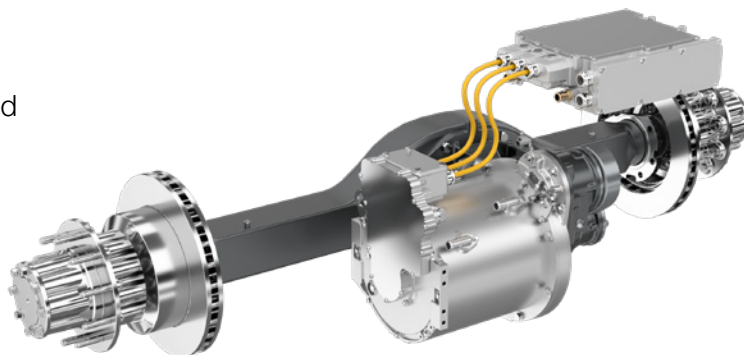


# EFFICIENCY THROUGH INNOVATION

## Our Innovation Keeps You Moving

### Efficiency Through Innovation

As a world leader in drivetrain technology, Dana is focused on keeping your business optimized and running strong. From breakthrough, patented technologies to industry-leading innovations, our commercial-vehicle products increase durability, reliability, and efficiency. See us in action at [dana.com/cv](http://dana.com/cv).

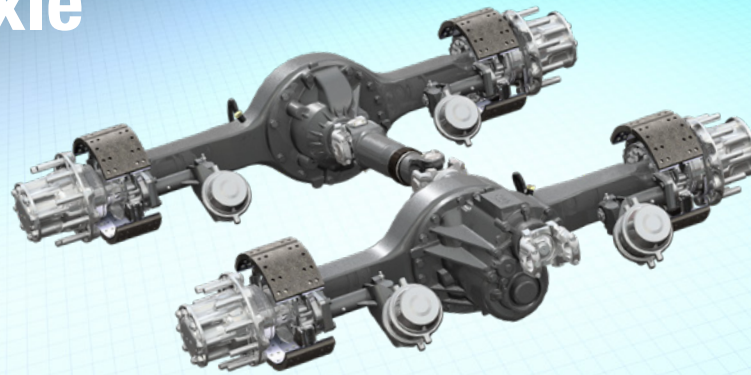


### Reducing Operating Costs to Increase Bottom Lines

Armed with cutting-edge information and superior under-the-vehicle knowledge, our Dana Nationwide Support Team is committed to helping customers increase efficiencies to increase profits. From supplying the latest information and technical support tools to servicing your drivelines quickly and cost efficiently, you'll be happy we're on your side.



# Drive Axle

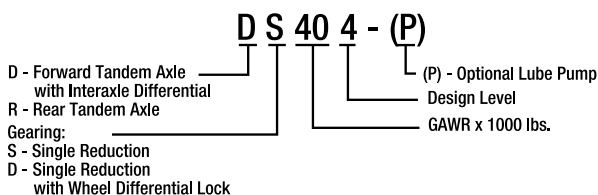
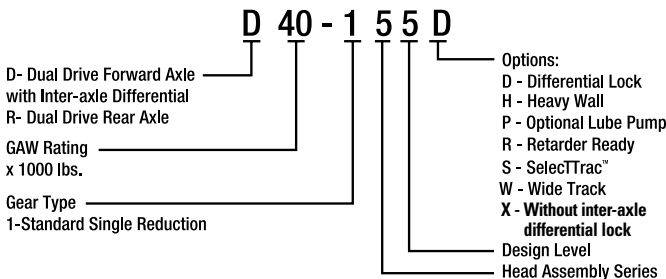


## General Information – Heavy- and Medium-Duty

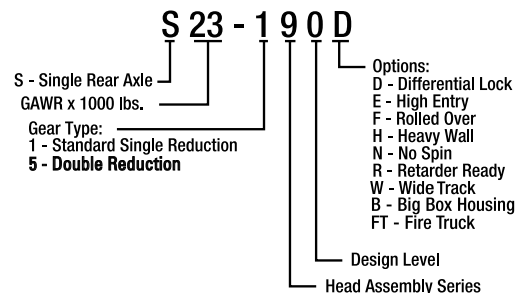
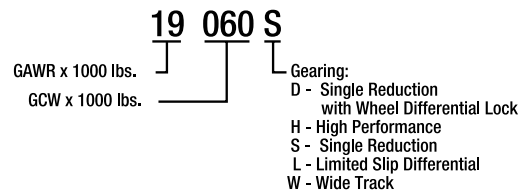
As a world leader in innovative axle technology, Dana provides a full line of the most efficient light-duty, medium-duty, heavy-duty, and specialty rear axle products available for commercial-vehicle applications. Our exclusive combination of patented technologies and designs ensures long service life, reduced maintenance, and more durable axle products.

## Nomenclature

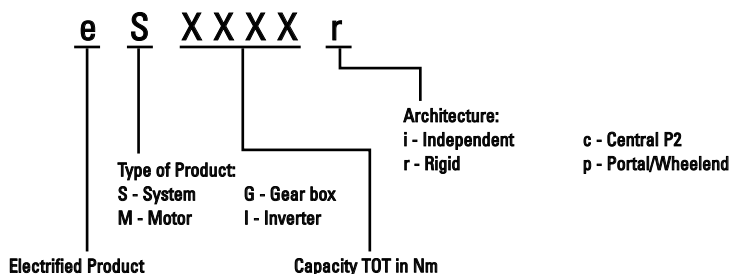
### Tandem Drive Axle



### Single Drive Axle



### e-Drive Units and Axles



# Drive Axle

## Applications – Heavy- and Medium-Duty

### Tandem Drive Axles

Model	Description	Max. GAW lbs. [kg]	Linehaul	Heavy Haul	Logging	Mining	Oil Field	Construction	City Delivery	School Bus	Rescue	Refuse	Recreational	Intercity Coach
D40-145	Pro-40™	40,000 [18,144]												
D40-155/156	AdvanTEK® 40	40,000 [18,144]												
DSH40	High Performance-40	40,000 [18,144]												
DSH44	High Performance-44	44,000 [19,958]												
D40-172	Super 40	40,000 [18,144]												
D46-172	Vocational	46,000 [20,865]												
D50-172	Vocational	50,000 [22,680]												
D52-190	Vocational	52,000 [23,587]												
D60-190	Vocational	60,000 [27,216]												

### Dual Range

DT463-P	Two-Speed	46,000 [20,865]												
DT521-P	Two-Speed	52,000 [23,587]												

### Double Reduction

D46-590P	Helical	46,000 [20,865]												
D52-590P	Helical	52,000 [23,587]												
D60-590P	Helical	60,000 [27,216]												
D70-590P	Helical	70,000 [31,751]												

### Tridem

T69-172HP	Heavy-Duty	69,000 [31,298]												
T78-190P	Heavy-Duty	78,000 [35,380]												
T78-590P	Heavy-Duty	78,000 [35,380]												

### 6x2

S21-172 / S20-045B	EconoTrek™	40,000 (18,144)												
S23-190 / S20-045B	EconoTrek™	40,000 (18,144)												

BLUE AREAS INDICATE AVAILABILITY.

# Drive Axle

## Applications – Heavy- and Medium-Duty

### Single Drive Axles

Model	Description	Max. GAW lbs. [kg]	Linehaul	Heavy Haul	Logging	Mining	Oil Field	Construction	City Delivery	School Bus	Rescue	Refuse	Recreational	Intercity Coach
S14-110	Medium-Duty	14,000 [6,350]												
S16-130	Medium-Duty	16,000 [7,257]												
S17-140	Medium-Duty	17,000 [7,711]												
S19-140	Medium-Duty	19,000 [8,618]												
17060S	Medium-Duty	17,000 [7,711]												
19060S	Medium-Duty	19,000 [8,618]												
S20-140	Medium-Duty	20,000 (9,072)												
S21-140	Medium-Duty	21,000 (9,525)												
21060S	Medium-Duty	21,000 [9,525]												
22060S	Medium-Duty	22,000 [9,979]												
23060SH	Medium-Duty	23,000 [10,433]												
S21-172	Heavy-Duty	21,000 [9,525]												
S21-175	Heavy-Duty	21,000 [9,525]												
S23-172	Heavy-Duty	23,000 [10,433]												
S23-175	Heavy-Duty	23,000 [10,433]												
S23-190	Heavy-Duty	23,000 [10,433]												
S25-172	Heavy-Duty	25,000 [11,340]												
S25-175	Heavy-Duty	25,000 [11,340]												
S26-190	Heavy-Duty	26,000 [11,793]												
S30-190	Heavy-Duty	30,000 [13,608]												

### Two-Speed

19055T	Medium-Duty	19,000 [8,618]												
21065T	Medium-Duty	21,000 [9,525]												
22065T	Medium-Duty	22,000 [9,979]												
23082T	Heavy-Duty	23,000 [10,433]												
26082T	Heavy-Duty	26,000 [11,793]												

### Double Reduction

S23-590	Heavy-Duty	23,000 [10,433]												
S26-590	Heavy-Duty	26,000 [11,793]												
S30-590	Heavy-Duty	30,000 [13,608]												
S35-590	Heavy-Duty	35,000 [15,876]												

BLUE AREAS INDICATE AVAILABILITY.

# Drive Axle

## Heavy-Duty Drive Axle

### Spicer® Single Reduction Single Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options					
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		Select Trac™	Differential Lock	Electromagnetic Retarder	No Spin Differential		
S21-172	21,000 [9,525]	100,000 [45,359]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83	2.06 [52]	46	2.35 [60]	17.3 [440]	4.61 [117]	5.24 [134]	0.43 [11]	R						
S21-175	21,000 [9,525]	115,000 [52,000]	1.95, 2.05, 2.16, 2.31, 2.47, 2.64, 2.85, 3.07, 3.42				17.9 [455]					Requires 0.5 [12.5] wall thickness					
S21-190	21,000 [9,525]	125,000 [56,699]	3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83				18.5 [470]										
S23-172		100,000 [45,359]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14				17.3 [440]										
S23-175	23,000 [10,433]	115,000 [52,000]	1.95, 2.05, 2.16, 2.31, 2.47, 2.64, 2.85, 3.07, 3.42	2.25 [57]	49	17.9 [455]											
S23-190		125,000 [56,699]	3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83	2.06 [52]	46	18.5 [470]											
S25-172	25,000 [11,340]	100,000 [45,359]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14	2.25 [57]	49	17.3 [440]								0.50 [12.5]			
S25-175	25,000 [11,340]	115,000 [52,000]	2.47, 2.64, 2.85, 3.07, 3.42			17.9 [455]											
S26-190	26,000 [11,793]	125,000 [56,699]	3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83			18.5 [470]											
S30-190	30,000 [13,608]		5.31 [135]	5.91 [150]	0.63 [16]	W											

Rating is subject to Dana engineering application approval.

### Spicer High Entry Single Reduction Single Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options			
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		Differential Lock	Electromagnetic Retarder	No Spin Differential	
S21-172E	21,000 [9,525]	100,000 [45,359]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17	2.06 [52]	46	2.35 [60]	17.7 [450]	4.61 [117]	5.24 [134]	0.43 [11]	R				
S23-172E	23,000 [10,433]		3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83									18.5 [470]			
S23-190E		125,000 [56,699]	3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17									17.7 [450]			
S25-172E	25,000 [11,340]	100,000 [45,359]	3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17									18.5 [470]			
S26-190E	26,000 [11,793]	125,000 [56,699]	5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83	2.25 [57]	49	18.5 [470]	5.31 [135]	5.91 [150]	0.63 [16]	W					
S30-190E	30,000 [13,608]		5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83												

Rating is subject to Dana engineering application approval.

BLUE AREAS INDICATE AVAILABILITY.

# Drive Axle

## Heavy-Duty Drive Axle

### Spicer® Single Reduction Tandem Drive Axles

Product	Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Wheel-end Series	Options			
		Max. GAW lbs. [kg]	Max. GCW** Turnpike lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		Thickwall Housing	Differential Lock	SelectTrac™	Pump
Pro-40™	D40-145	40,000 [18,144]	110,000 [49,895]	3.36, 3.42, 3.55, 3.70, 3.91, 4.10, 4.88, 5.29, 5.57	1.88 [46]	41	2.10 [53]	F 15.4 [391] R 13.4 [340]	4.61 [117]	5.24 [134]	0.37 [9.5]	R	0.43 [11]			
	D40-155		145,000 [65,771]	2.26, 2.39, 2.47, 2.53, 2.64, 2.79, 2.93				15.75 [400]					0.43 [11]			
	D40-156			2.79, 2.93, 3.08, 3.23, 3.36, 3.42, 3.55, 3.70, 3.91												
High Performance-40	DSH40	143,000 [64,864]	3.08, 3.25, 3.36, 3.42, 3.55, 3.70, 3.90, 4.11, 4.33, 4.63, 4.88, 5.29, 5.57, 6.17, 6.50	15.7 [400]	0.43 [11]											
High Performance-44	DSH44	44,000 [19,958]	72,000 [32,659] GVW	3.25, 3.36, 3.42, 3.55, 3.70, 3.90, 4.11, 4.33, 4.63, 4.88, 5.29, 5.57, 6.17, 6.50, 7.17	17.3 [440]	0.50 [12.5]	STD									
EconoTrac™ 6x2	S21-172 and S20-045B	40,000 [18,144]	100,000 [45,359]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14	2.06 [52]	46	2.35 [60]	17.3 [440]	4.61 [117]	5.24 [134]	0.43 [11] and 0.37 [9.5]	R	0.50 [12.5]			
	S21-175 and S20-045B		115,000 [52,163]	1.95, 2.05, 2.16, 2.31, 2.47, 2.64, 2.85, 3.07, 3.42				17.9 [455]					Requires 0.5 [12.5] and 0.43 [11] wall thickness			

Rating is subject to Dana engineering application approval. \*\* For 3% max. grade.

### Spicer Single Reduction Heavy Tandem and Tridem Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options			
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		Differential Lock	Pump	Electromagnetic Retarder	No Spin Differential
D40-172	40,000 [18,144]	160,000 [72,575]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14	2.06 [52]	46	2.35 [60]	F 17.7 [440] R 17.3 [440]	4.61 [117]	5.24 [134]	0.43 [11] 0.50 [12.5]	R				
D46-172	46,000 [20,865]														
D50-172	50,000 [22,680]														
D52-190P	52,000 [23,587]	225,000 [102,058]	3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83	2.25 [57]	46	2.35 [60]	18.5 [470]	5.31 [135]	5.91 [150]	0.63 [16]	W				
D60-190P	60,000 [27,216]														
T69-172HP*	69,000 [31,298]	160,000 [72,575]	3.07, 3.21, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14	2.06 [52]	46	2.35 [60]	F 17.7 [440] R 17.3 [440]	4.61 [117]	5.24 [134]	0.63 [16]	R	STD			
T78-190P*	78,000 [35,380]	240,000 [108,862]	3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.78, 5.25, 5.38, 5.57, 6.14, 6.83, 7.17, 7.83	2.25 [57]	46	2.35 [60]	18.5 [470]	5.31 [135]	5.91 [150]	0.63 [16]	R				

Rating is subject to Dana engineering application approval. \* Tridem axle configuration.

BLUE AREAS INDICATE AVAILABILITY.



# Drive Axle

## Heavy-Duty Drive Axle

### Spicer® Two-Speed and Double Reduction Single Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options	
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width	Box Section Height	Wall thickness at spring seat		Electromagnetic Retarder	Differential Lock
23082T	23,000 [10,433]	80,000 [36,287]	3.70/5.04, 3.90/5.31, 4.11/5.60, 4.33/5.90, 4.56/6.20, 4.88/6.64, 5.43/7.39, 6.17/8.40, 6.67/9.08	2.06 [52]	36	2.31 [59]	18 [457]	4.61 [117]	5.24 [134]	0.55 [14]	R		
26082T	26,000 [11,793]									0.50 [12.5]			
S23-590	23,000 [10,433]	125,000 [56,699]	4.75, 4.99, 5.19, 5.44, 5.70, 5.98, 6.34, 6.65, 7.30, 7.48, 7.75, 8.55, 9.51, 9.97, 10.90	2.25 [57]	46	2.35 [60]	18.5 [470]	5.31 [135]	5.91 [150]	0.63 [16]	W		
S26-590	26,000 [11,793]									0.87 [22]			
S30-590	30,000 [13,608]												
S35-590	35,000 [15,876]												

Rating is subject to Dana engineering application approval.

### Spicer Two-Speed and Double Reduction Tandem and Tridem Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options	
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width	Box Section Height	Wall thickness at spring seat		Pump	Differential Lock
DT463-P	46,000 [20,865]	160,000 [72,575]	3.70/5.04, 3.90/5.32, 4.11/5.60, 4.33/5.90, 4.56/6.21, 4.88/6.64, 5.43/7.39, 6.17/8.40	2.06 [52]	36	2.31 [59]	18 [457]	4.61 [117]	5.24 [133]	0.56 [14]	R		
DT521-P	52,000 [23,587]									0.63 [16]			
D46-590HP	46,000 [20,865]	240,000 [108,862]	4.75, 4.99, 5.19, 5.44, 5.70, 5.98, 6.34, 6.65, 7.30, 7.48, 7.75, 8.55, 9.51, 9.97, 10.90	2.25 [57]	46	2.35 [60]	18.5 [470]	4.61 [117]	5.24 [134]	0.63 [16]	W		
D52-590P	52,000 [23,587]												
D60-590P	60,000 [27,216]												
D70-590P	70,000 [31,751]												
T78-590P*	78,000 [35,380]							5.31 [135]	5.91 [150]	0.63 [16]			

Rating is subject to Dana engineering application approval. \* Tridem axle configuration.

BLUE AREAS INDICATE AVAILABILITY.

### Spicer 6x2 Tag Axle Option

Axle Model	Max. GAW lbs. [kg]	Width in. [mm]	Height in. [mm]	Wall in. [mm]	Spindle Type
S20-045B	20,000 [9,072]	4.61 [117]	5.24 [133]	0.37 [9.4]	R
S21-060B	21,000 [9,525]			0.43 [11]	
S23-070B	23,000 [10,433]			0.50 [12.5]	

Rating is subject to Dana engineering application approval.

# Drive Axle

## Medium-Duty Drive Axle

### Spicer® Single Reduction Single Drive Axles

Axle Model	Ratings		Ratios	Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options										
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]		Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		Differential Lock	Parking Brake	Trac-Lok	No Spin Differential							
S14-110*	14,000 [6,350]	35,000 [15,876]	3.07, 3.31, 3.58, 3.73, 3.91, 4.10, 4.30, 4.44, 4.56, 4.78, 4.88, 5.13, 5.38, 5.57, 5.86, 6.14, 6.50	1.57 [40]	34	1.75 [44]	11.8 [300]	4.25 [108]	4.25 [108]	0.31 [8]	Varies by OEM											
S16-130*	16,000 [7,257]	40,000 [18,144]		1.61 [41]	36	1.89 [48]	12.2 [310]			0.39 [9.5]												
S17-140*	17,000 [7,711]	50,000 [22,680]	3.31, 3.36, 3.42, 3.58, 3.73, 3.91, 4.10, 4.30, 4.56, 4.88, 5.29, 5.57, 6.14, 6.50	1.81 [46]	39	2.00 [51]	13.4 [340]	4.61 [117]	5.24 [134]	0.39 [9.5]	L											
S19-140*	19,000 [8,618]																					
S20-140*	20,000 [9,071]																					
S21-140*	21,000 [9,525]																0.43 [11]	R				
17060S ◇	17,000 [7,711]	60,000 [27,216]	3.08, 3.25, 3.36, 3.55, 3.70, 3.90, 4.11, 4.30, 4.33, 4.63, 4.78, 4.88, 5.29, 5.57, 6.17, 6.50, 7.17	1.81 [46]	39	2.00 [51]	15.4 [391]	4.61 [117]	5.24 [134]	0.37 [9.5]	L											
19060S ◇	19,000 [8,618]																					
21060S ◇	21,000 [9,525]													0.43 [11]	R							
22060S ◇	22,000 [9,979]																					
23060SH ◇	23,000 [10,433]					1.88 [48]				41	2.10 [53]				0.50 [12.5]	R						

Rating is subject to Dana engineering application approval. \* GenTech™ gearing is standard for this model. ◇ Optional GenTech™ gearing for coach and bus applications available on this model.

### Spicer Two-Speed and Planetary Double Reduction Single Drive Axles

Axle Model	Ratings		Ratios		Axle Shaft			Nominal Ring Gear Diameter in. [mm]	Axle Housing			Spindle Type	Options
	Max. GAW lbs. [kg]	Max. GCW HWY lbs. [kg]	Two-Speed	Double Reduction	Body Diameter in. [mm]	Number of Splines	Spline Diameter in. [mm]		Box Section Width in. [mm]	Box Section Height in. [mm]	Wall thickness at spring seat in. [mm]		No Spin Differential
19055T 19055P	19,000 [8,618]	60,000 [27,216]	3.90/5.32, 4.11/5.61, 4.33/5.91, 4.63/6.31, 4.88/6.65, 5.29/7.21, 5.57/7.60, 6.17/8.42, 6.50/8.87, 7.17/9.77	5.32, 5.61, 5.91, 6.31, 6.65, 7.21, 7.60, 8.42, 8.87, 9.77	1.81 [46]	39	2.00 [51]	16.5 [419]	4.61 [117]	5.24 [133]	0.37 [9.5]	R	
21065T 21065P	21,000 [9,525]												
22065T 22065P	22,000 [9,979]					1.89 [48]	41						2.10 [53]

Rating is subject to Dana engineering application approval.

BLUE AREAS INDICATE AVAILABILITY.

# Drive Axle

## e-Drive Units & Axles

Application	Model	Max. GVW lbs. [kg]	Max. GAWR lbs. [kg]	Max. Speed mph [kph]	Peak Power kW	Max. Output Torque Nm
Light Commercial Vehicle	eS4500i	4,189 [1,900]	2,646 [1,200]	14,000 rpm	180	4,500
Light Commercial Vehicle, Mini Bus	eS5700r	16,535 [7,500]	7,716 [3,500]	43 [69]	130	5,700
Medium-Duty Truck, Medium Bus	eS9000r	23,500 [10,659]	15,500 [7,030]	75 [120]	237	9,000

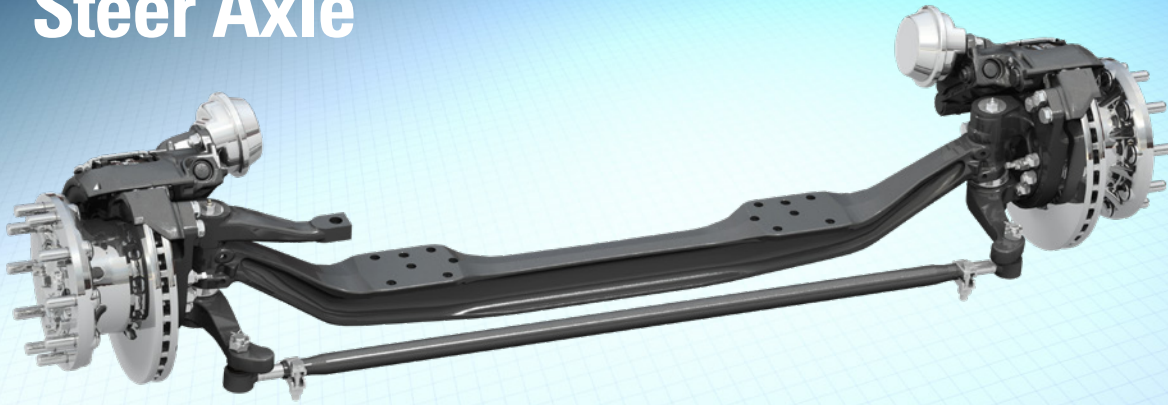
# Drive Axle

## Lubrication Intervals – Heavy- and Medium-Duty

Spicer® Drive Axle Lubrication Intervals				
Synthetic or Mineral	Lubricant	SAE	Linehaul	On/Off-Hwy
<b>Synthetic</b>	SHAES-256	75W-90 FE 75W-90 XFE 75W-90 XFE 75W-85	500,000 mi (800,000 km) or 5 years (whichever comes first)	120,000 mi (193,000 km) or 1 year (whichever comes first)
<b>Mineral Base</b>	MIL-L-2105E/J02360, API GL-5 Gear oil, MIL-PRF-2105E	75W, 75W-90, 75W-140, 80W-90, 85W-140	120,000 mi (193,000 km) or 1 year (whichever comes first)	60,000 mi (96,500 km) or 1 year (whichever comes first)

We recommend genuine Spicer® lubricants approved to SHAES 256, Rev. E

# Steer Axle

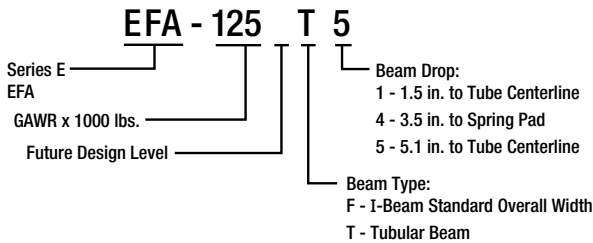
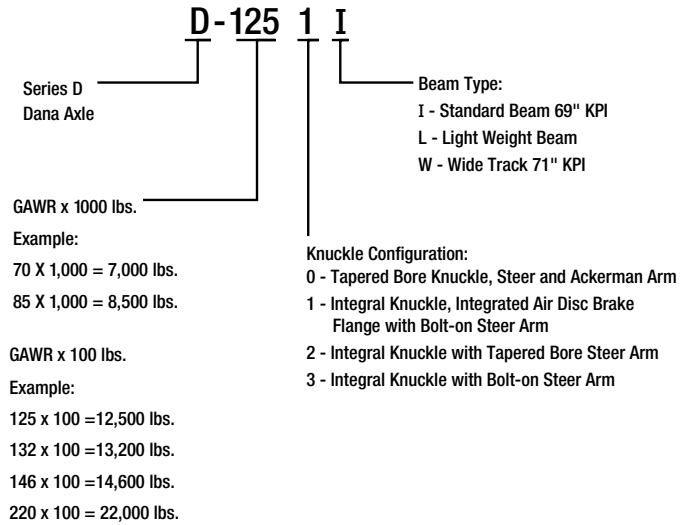
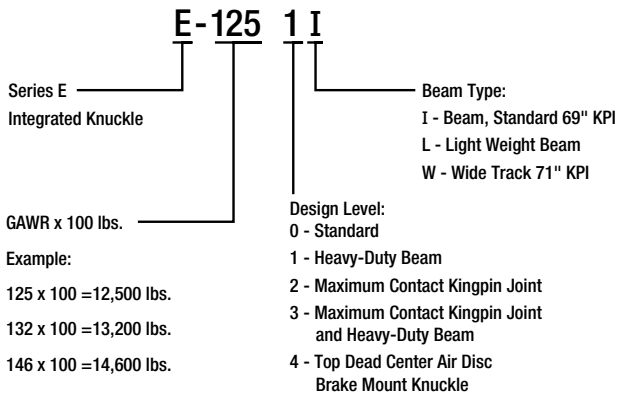


## General Information – Heavy- and Medium-Duty

At Dana, our world-class innovations offer the highest efficiencies in a full line of medium-duty, heavy-duty, and specialty axle products for all commercial-vehicle applications. As a world leader in front axle technology, we provide our customers with the most versatile, durable, and reliable steer axles on the market.

## Nomenclature

### Steer Axle



# Steer Axle

## Applications – Heavy- and Medium-Duty

### Steer Axles

Model	Description	Max. GAW lbs. [kg]	Linehaul	Heavy Haul	Logging	Mining	Oil Field	Construction	City Delivery	School Bus	Rescue	Refuse	Recreational
D-600 – D-850	Medium-Duty	8,500 [3,856]								■	■	■	■
I-100SG – I-140SG	Medium-Duty	14,600 [6,622]								■	■	■	■
E-1002 – E-1252	Linehaul	12,500 [5,670]	■						■	■	■	■	■
E-1203, E-1322, E-1462	Linehaul/Severe Service	14,600 [6,622]	■	■	■				■	■	■	■	■
D-1001 – D-1461	Linehaul/Severe Service	14,600 [6,622]	■	■	■				■	■	■	■	■
I-100W – I-220W	Severe Service/ Wide Track	22,000 [9,979]		■	■	■			■			■	■
D-2000F, D-2200F	Severe Service	22,800 [10,342]		■	■	■	■		■			■	■
EFA-22T – EFA-24T	On/Off Highway Tubular Beam	24,000 [10,886]		■		■	■						

BLUE AREAS INDICATE AVAILABILITY.

# Steer Axle

## Heavy- and Medium-Duty

### Spicer® Integral Arm Steer Axles

Nominal Load Rating lbs. [kg]	Model	LWB	Beam Width** (KPI) in. [mm]	Beam Drop in. [mm]			LMS™ Hub Option	Bearing Cone Inner / Outer*
				3.5 [89]	3.74 [95]	5.0 [127]		
10,000 [4,536]	E-1002I		69.0 [1753]				HM212049/ 3782	
	E-1002W		71.0 [1803]					
12,500 [5,670]	E-1252I		69.0 [1753]					
	E-1252W		71.0 [1803]					
			71.5 [1816]					
13,200 [5,987]	E-1322I		69.0 [1753]					
	E-1322W		71.0 [1803]					
			71.5 [1816]					
14,600 [6,622]	E-1462I		69.0 [1753]					
	E-1462W		71.0 [1803]					
			71.5 [1816]					
10,000 [4,536]	D-1001I		69.0 [1753]					HM212049/ 3782
	D-1001W		71.0 [1803]					
			71.5 [1816]					
12,500 [5,670]	D-1251I		69.0 [1753]					
	D-1251W		71.0 [1803]					
			71.5 [1816]					
13,200 [5,987]	D-1321I		69.0 [1753]					
	D-1321W		71.0 [1803]					
			71.5 [1816]					
14,600 [6,622]	D-1461I		69.0 [1753]					
	D-1461W		71.0 [1803]					
			71.5 [1816]					

\* Standard bearing numbers shown. Does not apply with LMS hub. \*\*"W" version models provide additional turning angle. Beam width dimension contingent on vehicle manufacturer.

### Spicer Conventional Arm Steer Axles

Nominal Load Rating lbs. [kg]	Model	Beam Width (KPI) in. [mm]	Beam Drop in. [mm]			LMS™ Hub Option	Bearing Cone Inner/Outer
			3.5 [89]	3.74 [95]	5.0 [127]		
6,000 [2,722]	D-600N	62.7 [1593]				N/A	45284/25880
7,000 [3,175]	D-700N	62.7 [1593]					
	D-700F	71.0 [1803]					
8,000 [3,629]	D-800F	71.0 [1803]					
	D-800W	72.0 [1829]				JM207049A/ 25877	
8,500 [3,856]	D-850F	71.0 [1803]				N/A	6461A/ 555S
	D-850W	72.0 [1829]					
20,000 [9,072]	D-2000F	68.0 [1727]					
	D-2000W	70.66 [1795]			5.24 [133]		
22,000 [9,979]	EFA-22T2	Variable	1.5 [38]				
	EFA-22T5	Variable			5.1 [130]		
22,800 [10,342]	D-2200F	68.0 [1727]					
	D-2200W	70.66 [1795]			5.24 [133]		
24,000 [10,886]	EFA-24T2	Variable	1.5 [38]				
	EFA-24T5	Variable			5.1 [130]		

BLUE AREAS INDICATE AVAILABILITY.

# Steer Axle

## Lubrication Intervals – Heavy- and Medium-Duty

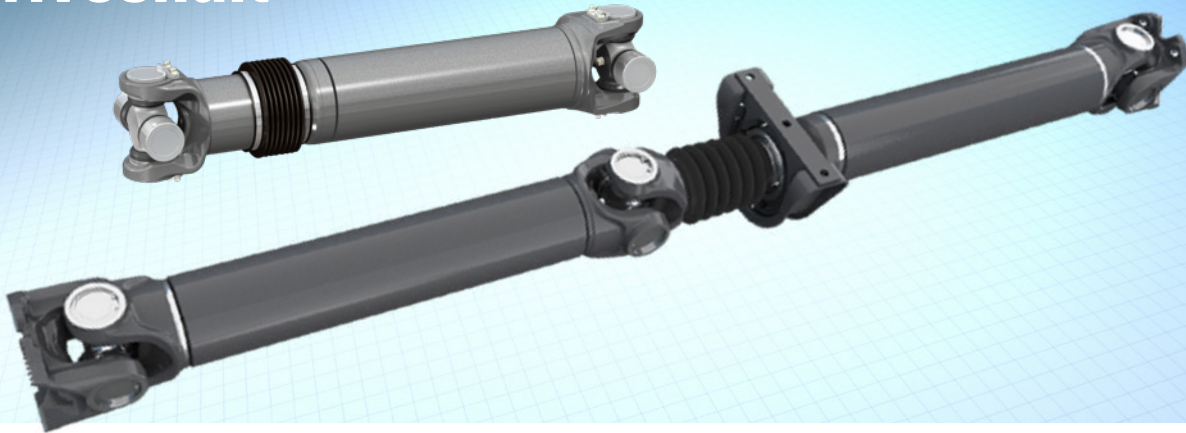
Spicer® Steer Axle Lubrication Intervals				
Type of Lube System	Lubricant	SAE	Linehaul	On/Off-Hwy
King Pin Joint Grease/ Tie Rod Ends	Heavy-Duty Multipurpose Lithium Based*	#1 Grade** or #2 grade	50,000 miles (80,467 km) or 6 months (whichever comes first)	Every 50 hours

\* Do not mix with sodium-based grease. Do not use greases other than what is indicated above.

\*\* #1 grade is used for extra cold.

**We recommend genuine Spicer® lubricants.**

# Driveshaft



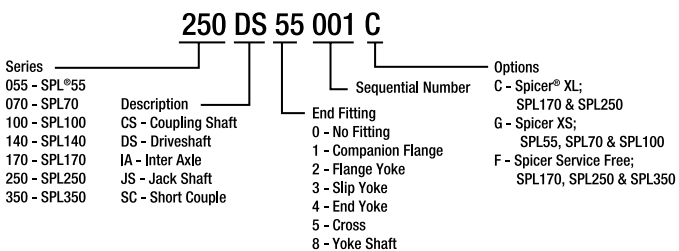
## General Information – Heavy- and Medium-Duty

At Dana, we offer a complete line of light-duty, medium-duty, heavy-duty, and specialty driveshaft products for every commercial-vehicle application. As a world leader in driveshaft technology, our innovative, industry-leading products provide the most efficient, reliable, and durable performance on the road.

- Robust, patented driveshaft technologies
- High-Power Density™ (HPD™) provides more strength
- Lighter weight than competitive products
- Service-free designs available for reduced maintenance

## Nomenclature

### Driveshaft





# Driveshaft

## High Torque, Low RPM Applications

Handling heavy loads over the long haul has never been easier or more efficient, thanks to Dana's Spicer Life® Series driveshafts. Now enhanced to offer even greater torque, durability, and savings, SPL® products offer 70 percent more power density than their nearest competitor and a 40 percent increase in bearing life. No other U-joint meets the needs of high-efficiency truck applications better than the SPL U-joint. This product is now available with a service-free option for even greater savings.

## Spicer Life® Series Operating Parameters

Series	Max. Momentary Joint Angle	Standard Slip	Rotating Diameter of Universal Joint	Rotating Diameter of End Yoke
SPL140	25°	110 mm 4.33 in	160 mm 6.30 in	174 mm 6.22 in
SPL170			185 mm 7.28 in	
SPL170 I/A	45°	150 mm 5.91 in		193 mm 7.60 in
SPL250	25°	110 mm 4.33 in	193 mm 7.62 in	
SPL250HD				
SPL250 Lite HT	45°	150 mm 5.91 in	185 mm 7.28 in	
SPL250 I/A				
SPL350	25°	110 mm 4.33 in	206 mm 8.11 in	219 mm 8.62 in
SPL350HD				
SPL350 Lite				
SPL350 Lite HT				

## Tubing Sizes for Spicer Life® Series

Series	Torque Rating		Tubing OD		Wall Thickness	
	(lbs. ft.)	Nm				
SPL140	7,744	10,500	107 mm	4.21 in	3.5 mm	.138 in
SPL140HD	10,325	14,000	110 mm	4.33 in	5 mm	.197 in
SPL170	12,539	17,000	126 mm	4.96 in	3 mm	.118 in
SPL170HD	12,539	17,000	128.5 mm	5.06 in	4.25 mm	.167 in
SPL170 I/A	11,063	15,000	116.7 mm	4.59 in	4.57 mm	.180 in
SPL250	16,595	22,500	128.5 mm	5.06 in	4.25 mm	.167 in
SPL250HD	18,439	25,000	130 mm	5.12 in	5 mm	.197 in
SPL250 Lite HT			118.6 mm	4.67 in	5.2 mm	.205 in
SPL250 I/A	15,489	21,000	128.5 mm	5.06 in	4.25 mm	.167 in
SPL350	22,127	30,000	138.5 mm	5.45 in	4.25 mm	.167 in
SPL350HD	25,815	35,000	140 mm	5.51 in	5 mm	.197 in
SPL350 Lite	18,439	25,000	118.6 mm	4.67 in	5.2 mm	.205 in
SPL350 Lite HT	22,127	30,000	120.2 mm	4.73 in	6 mm	.236 in

## Journal Cross and Bearing Kits

Series	U-Joint Kit for Quick Disconnect™ End Yoke
SPL140	SPL140X
SPL170	SPL170-4X
SPL170SF	SPL170-SF4X
SPL250	SPL250-3X
SPL250SF	SPL250-SF3X
SPL350	SPL350X
SPL350SF	SPL350SFX

SF = Service Free

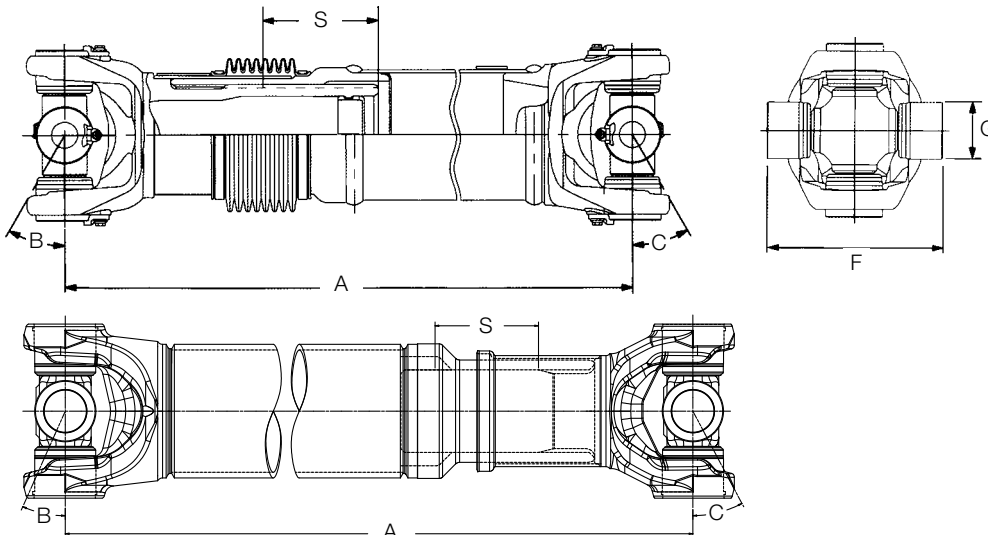
# Driveshaft

## Spicer Life® Series – Heavy-Duty

### Slip Between Center Driveshaft

Driveshaft Assembly Part Number	Minimum Length Collapsed Centerline to Centerline of Cross "A"		Slip Joint End			Tight Joint End			U-Joint Span "F"		Bearing Cup Diameter "G"	
			Slip "S"		Maximum Angle "B"	Tube Size		Maximum Angle "C"				
	mm	in	mm	in		mm	in		mm	in	mm	in
SPL140 140DS55007	430	16.93	110	4.33	25°	107.0 x 3.5	4.21 x .138	25°	139	5.46	49	1.93
SPL140HD 140DS55001						110.0 x 5.0	4.33 x .197					
SPL170 170DS55007C 170DS55007F	440	17.34	110	4.33	25°	126.0 x 3.0	4.96 x .118	25°	164	6.46	55	2.16
SPL170HD 170DS55011C 170DS55011F						128.5 x 4.25	5.06 x .167					
SPL170I/A 170IA55010C 170IA55010F	528.6	20.81	150	5.91	45°	116.7 x 4.57	4.59 x .180	45°				
SPL250 250DS55007C 250DS55007F	450.3	17.73	110	4.33	25°	128.5 x 4.25	5.06 x .167	25°	163	6.42	60	2.37
SPL250HD 250DS55011C 250DS55011F						130.0 x 5.0	5.12 x .197	25°				
SPL250 I/A 250IA55001C 250IA55001F	507.7	19.99	150	5.91	45°	128.5 x 4.25	5.06 x .167	45°	163	6.42	60	2.37
SPL350 350DS55001 350DS55001F	468	18.43	110	4.33	25°	140 x 5.0	5.51 x .197	25°	172	6.77	65	2.56
SPL350 HD 350DS55002 350DS55002F						138.5 x 4.25	5.45 x .167					
SPL350 Lite HT 350DS55004 350DS55004F	465.8	18.34	110	4.33	25°	120.2 x 6	4.73 x .236	25°				

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



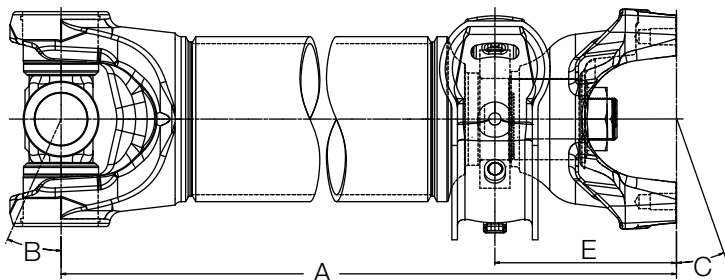
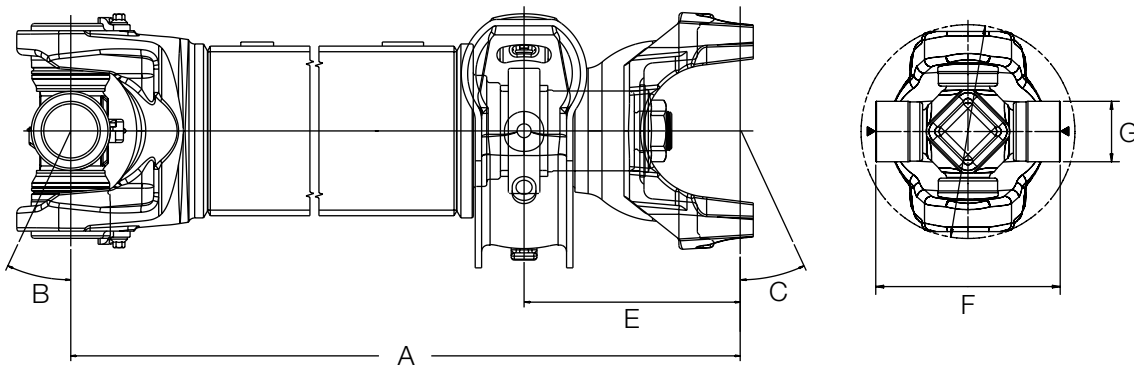
# Driveshaft

## Spicer Life® Series – Heavy-Duty

### Fixed Yoke Coupling Shaft Assembly with Center Bearing

Coupling Shaft Assembly Part Number	Minimum Length Centerline of Cross to Centerline of End Yoke "A"		Maximum Angle "B"	Tube Size		Centerline of Bearing to Centerline of End Yoke "E"		Maximum Angle "C"	U-Joint Span "F"		Bearing Cup Diameter "G"	
	mm	in		mm	in	mm	in		mm	in	mm	in
SPL140 140CS54025	350	13.79	25°	107.0 x 3.5	4.33 x .138	152	5.98	25°	139	5.46	49	1.93
SPL140HD 140CS54013				110.0 x 5.0	4.33 x .197	154	6.08					
SPL170 170CS54019C 170CS54019F	368	14.50	25°	126.0 x 3.0	4.96 x .118	160	6.30	25°	164	6.46	55	2.17
SPL170HD 170CS54017C 170CS54017F				128.5 x 4.25	5.06 x .167							
SPL250 250CS54007C 250CS54007F	382	15.05	25°	128.5 x 4.25	5.06 x .167	164	6.46	25°	163	6.42	60	2.37
SPL250HD 250CS54014C 250CS54014F				130.0 x 5.0	5.12 x .197							
SPL350 350CS54001 350CS54001F	371.2	14.61	25°	138.5 x 4.25	5.51 x .197	156.2	6.15	15°	172	6.77	65	2.56
SPL350HD 350CS54002 350CS54002F				140.0 x 5.0	5.45 x .167							

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



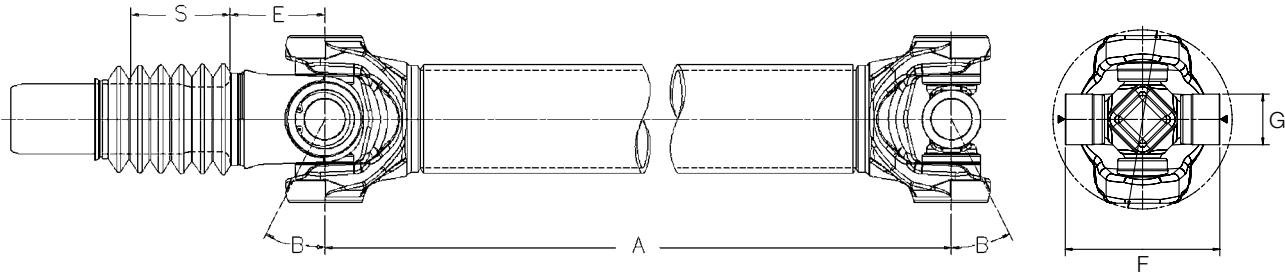
# Driveshaft

## Spicer Life® Series – Heavy-Duty – SPL® Lite Series

### Outboard Slip Driveshaft

Driveshaft Assembly Part Number	Minimum Length Centerline of Cross to Centerline of Cross "A"		Maximum Angle "B"	Tube Size		Slip "S"		Centerline of Cross to Shoulder of Yoke Shaft "E"		U-Joint Span "F"		Bearing Cup Diameter "G"	
	mm	in		mm	in	mm	in	mm	in	mm	in	mm	in
SPL250 Lite HT 250DS85001 250DS85001F	286	11.26	25°	118.6 x 5.2	4.67 x .205	110	4.33	101.3	3.99	163	6.42	60	2.37
SPL350 Lite 350DS85001 350DS85001F	290.5	11.44		118.4 x 5.2	4.66 x .205			105	4.13	172	6.77	65	2.56
SPL350 Lite HT 350DS85002 350DS85002F				120.2 x 6.0	4.73 x .236								

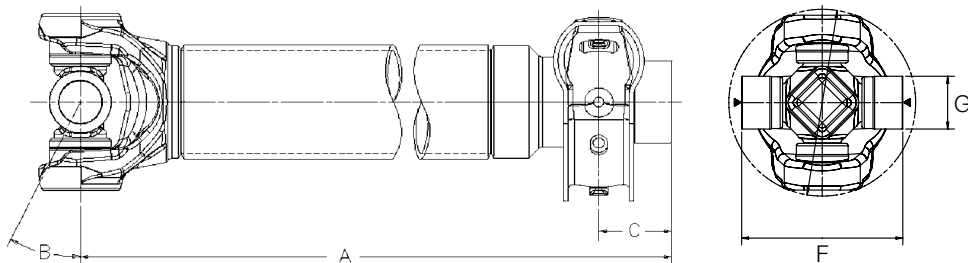
For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



### Outboard Slip Coupling Shaft Assembly with Center Bearing

Coupling Shaft Assembly Part Number	Minimum Length Centerline of Cross to End of Shaft "A"		Maximum Angle "B"	Tube Size		Centerline of Center Bearing to End of Sleeve "C"		U-Joint Span "F"		Bearing Cup Diameter "G"	
	mm	in		mm	in	mm	in	mm	in	mm	in
SPL250 Lite HT 250CS50001 250CS50001F	364.5	14.35	25°	118.6 x 5.2	4.67 x .205	76.5	3.01	163	6.42	60	2.37
SPL350 Lite 350CS50001 350CS50001F	366.5	14.4		118.4 x 5.2	4.66 x .205			172	6.77	65	2.56
SPL350 Lite HT 350CS50002 350CS50002F				120.2 x 6.0	4.73 x .236						

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



# Driveshaft

## Spicer Life® Series – Medium-Duty

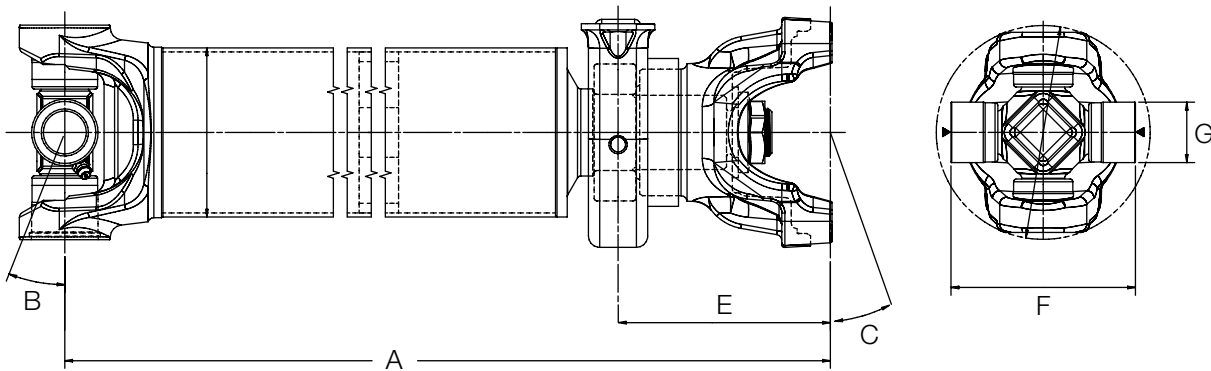
### Medium-Duty Service Kits

Driveshaft Series	U-Joint Kit	Kit Type
SPL55	SPL55-1X	Re-Lube
SPL55XS	SPL55X	Pre-Lube
SPL70	SPL70-1X	Re-Lube
SPL70XS	SPL70X	Pre-Lube
SPL100	SPL100-1X	Re-Lube
SPL100XS	SPL100X	Pre-Lube

### Fixed Yoke Coupling Shaft

Coupling Shaft Assembly Part Number	Minimum Length Centerline to Centerline of Cross "A"		Maximum Angle "B"	Tube Size		Centerline of Bearing to Centerline of End Yoke "E"		Maximum Angle "C"	U-Joint Span "F"		Bearing Cup Diameter "G"	
	mm	in		mm	in	mm	in		mm	in	mm	in
SPL55 055CS54006	233	9.17	22°	88.9 x 2.11	3.50 x .083	112	4.39	22°	106	4.19	35	1.37
SPL55XS 055CS54006G												
SPL70 070CS54004	249	9.80	26°	88.9 x 2.41	3.50 x .095	120	4.71	22.5°	126	4.96	35	1.37
SPL70XS 070CS54004G												
SPL100 100CS54003	289	11.39	25°	101.6 x 2.41	4.00 x .095	115	4.52	13.5°	126	4.96	41	1.63
SPL100XS 100CS54003G												

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



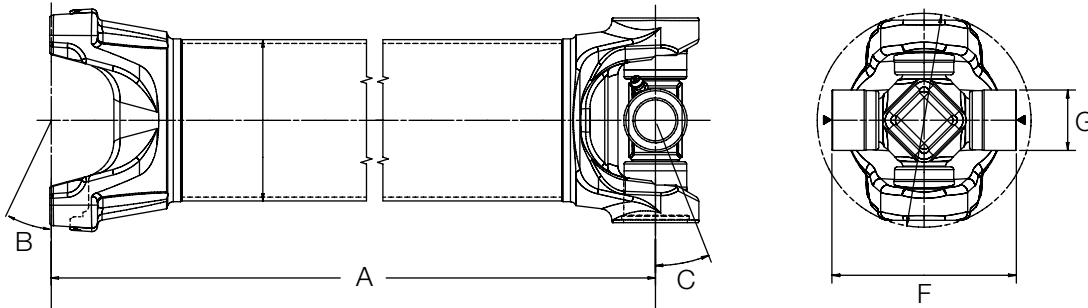
# Driveshaft

## Spicer Life® Series – Medium-Duty

### Driveshaft

Driveshaft Assembly Part Number	Minimum Length Centerline of Cross to End Yoke "A"		Maximum Angle "B"	Tube Size		Maximum Angle "C"	U-Joint Span "F"		Bearing Cup Diameter "G"	
	mm	in		mm	in		mm	in	mm	in
SPL55 055DS05003	160	6.28	25°	88.9 x 2.11	3.50 x .083	22°	106	4.19	35	1.37
SPL55XS 055DS05003G										
SPL70 070DS05003	168	6.62	25°	88.9 x 2.41	3.50 x .095	26°	126	4.96	35	1.37
SPL70XS 070DS05003G										
SPL100 100DS05002	206	8.00	23.5°	101.6 x 2.41	4.00 x .095	14.5°	126	4.96	41	1.63
SPL100XS 100DS05002G										

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



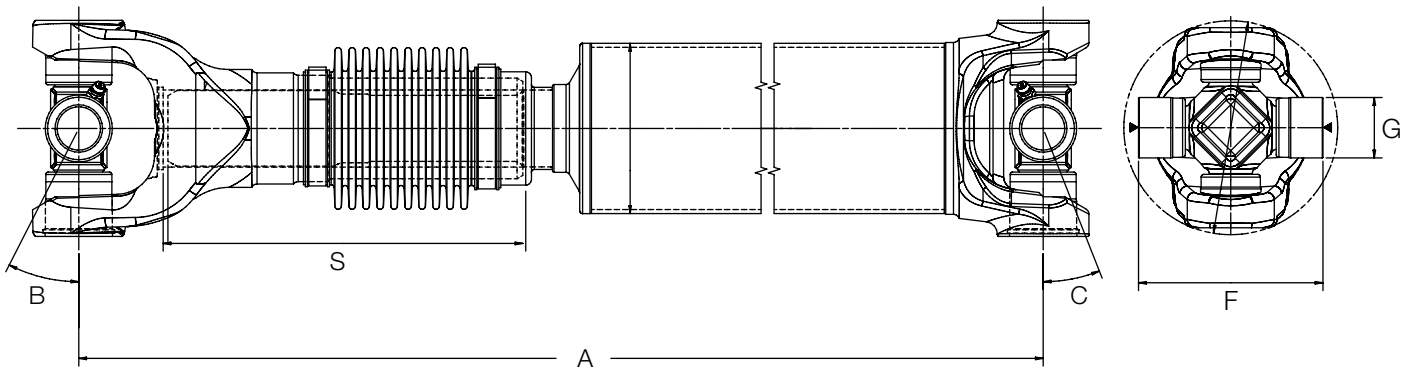
# Driveshaft

## Spicer Life® Series – Medium-Duty

### Slip Between Center Driveshaft

Driveshaft Assembly Part Number	Minimum Length Collapsed Centerline to Centerline of Cross "A"		Slip Joint End			Tight Joint End			U-Joint Span "F"		Bearing Cup Diameter "G"	
			Slip "S"		Maximum Angle "B"	Tube Size		Maximum Angle "C"				
	mm	in	mm	in		mm	in		mm	in	mm	in
SPL55 055DS55006	356	14.00	110	4.33	27°	88.9 x 2.11	3.50 x .083	22°	106	4.19	35	1.37
SPL55XS 055DS55006G												
SPL70 070DS55007	366	14.41	110	4.33	25°	88.9 x 2.41	3.50 x .095	26°	126	4.96	35	1.37
SPL70XS 070DS55007G												
SPL100 100DS55006	421	16.58	110	4.33	25°	101.6 x 2.41	4.00 x .095	25°	126	4.96	41	1.63
SPL100XS 100DS55006G												

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.



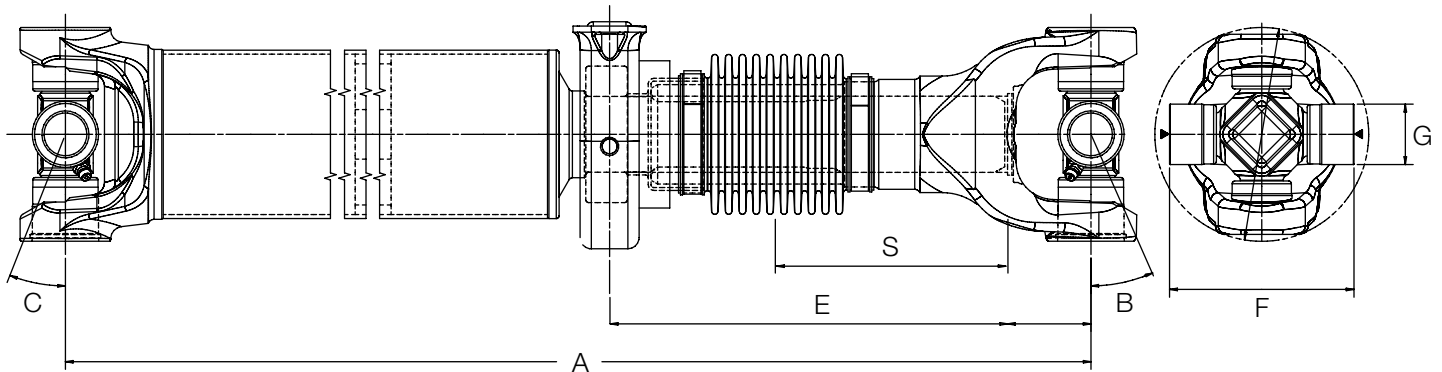
# Driveshaft

## Spicer Life® Series – Medium-Duty

### Outboard Slip Coupling Shaft

Driveshaft Assembly Part Number	Minimum Length Collapsed Centerline to Centerline of Cross "A"		Slip Joint End			Tight Joint End					U-Joint Span "F"		Bearing Cup Diameter "G"	
			Slip "S"	Max. Angle "B"	Centerline of Bearing to Centerline of Slip Yoke Collapsed "E"		Tube Size		Max. Angle "C"					
	mm	in			mm	in	mm	in		mm	in	mm	in	
SPL55 055CS55003	375	14.77	110	4.33	22°	254	9.84	88.9 x 2.11	3.50 x .083	22°	106	4.19	35	1.37
SPL55XS 055CS55003G														
SPL70 070CS55003	390	15.34	110	4.33	26°	260	10.25	88.9 x 2.41	3.50 x .095	26°	126	4.96	35	1.37
SPL70XS 070CS55003G														
SPL100 100CS55002	449	17.66	110	4.33	25°	273	10.75	101.6 x 2.41	4.00 x .095	25°	126	4.96	41	1.63
SPL100XS 100CS55002G														

For additional configurations, contact Spicer Driveshaft Engineering for specific application information.





# Driveshaft

## Lubrication Intervals – Heavy- and Medium-Duty

Spicer® Driveshaft Lubrication Intervals*				
Series	City	On-Hwy	Linehaul	On/Off-Hwy
<b>Spicer® 10 Series™ (1480 thru 1810 and SPL90)</b> Slip members also require lubrication.	8,000 mi (12,800 km) or 3 months (whichever comes first)	15,000 mi (24,000 km) or 3 months (whichever comes first)	15,000 mi (24,000 km) or 3 months (whichever comes first)	8,000 mi (12,800 km) or 3 months (whichever comes first)
<b>Spicer Life® Series – Medium-Duty (SPL55, 70 and 100)</b> Slip members are booted and permanently lubricated.	25,000 mi (40,000 km) or 6 months (whichever comes first)	25,000 mi (40,000 km) or 6 months (whichever comes first)	25,000 mi (40,000 km) or 6 months (whichever comes first)	25,000 mi (40,000 km) or 6 months (whichever comes first)
<b>Spicer Life® Series – Medium-Duty (SPL140)</b> Standard Spicer Life® Series U-joint. Slip members are booted and permanently lubricated.	25,000 mi (40,000 km) or 6 months (whichever comes first)	100,000 mi (160,000 km) or 6 months (whichever comes first)	100,000 mi (160,000 km) or 6 months (whichever comes first)	25,000 mi (40,000 km) or 6 months (whichever comes first)

Spicer Life First Lubrication Cycle*				
<b>Spicer Life – Heavy-Duty (SPL170, 250 and 350)</b> Extended lubrication U-joints. After initial miles (kilometers) or time is reached, the joints must be relubricated. Slip members are booted and permanently lubricated.	100,000 mi (160,000 km) or 1 year (whichever comes first)	350,000 mi (560,000 km) or 3 years (whichever comes first)	350,000 mi (560,000 km) or 3 years (whichever comes first)	100,000 mi (160,000 km) or 1 year (whichever comes first)

Spicer Life Relubrication Cycle*				
<b>Spicer Life – Heavy-Duty (SPL170, 250 and 350)</b> Extended lubrication U-joints. Once greased, this relubrication interval must be followed. Slip members are booted and permanently lubricated.	25,000 mi (40,000 km) or 6 months (whichever comes first)	100,000 mi (160,000 km) or 6 months (whichever comes first)	100,000 mi (160,000 km) or 6 months (whichever comes first)	25,000 mi (40,000 km) or 6 months (whichever comes first)

\*We require relubrication with lithium-based grease meeting NLGI Grade 2 specifications as well as ASTM D4950 “LB” specifications.



For premium results, use a synthetic lubricant like Spicer® Ultra-Premium Grease.

**NOTE:** We recommend that all driveshafts be inspected for wear and damage every time the vehicle is serviced. This includes any scheduled and/or unscheduled maintenance that occurs within the driveshaft lube intervals.

**City** is defined as all applications that require a minimum of 90% of operation time within the city limits.

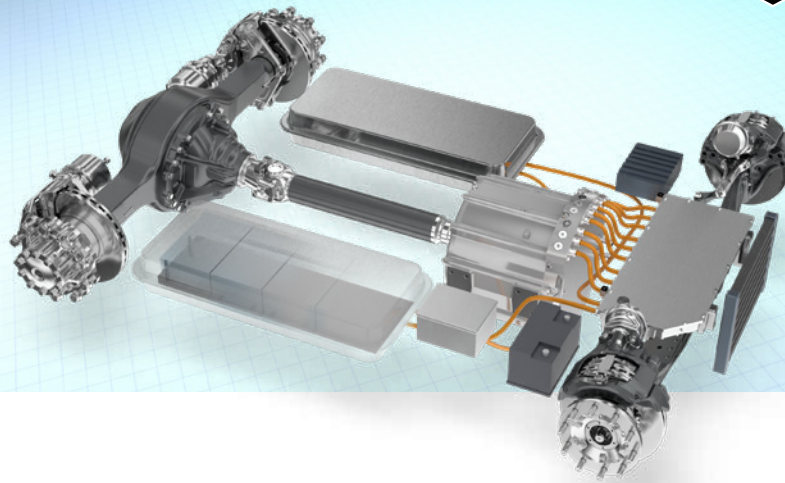
**On-Highway** is defined as all applications requiring less than 10% of operating time on gravel dirt or unpaved roads.

**Linehaul** is defined as 100% of operation time on smooth concrete or asphalt.

**On/Off-Highway** is defined as all applications operating primarily on paved roads, but requiring more than 10% of operating time on gravel, dirt, or unpaved roads.

**We recommend genuine Spicer® lubricants.**

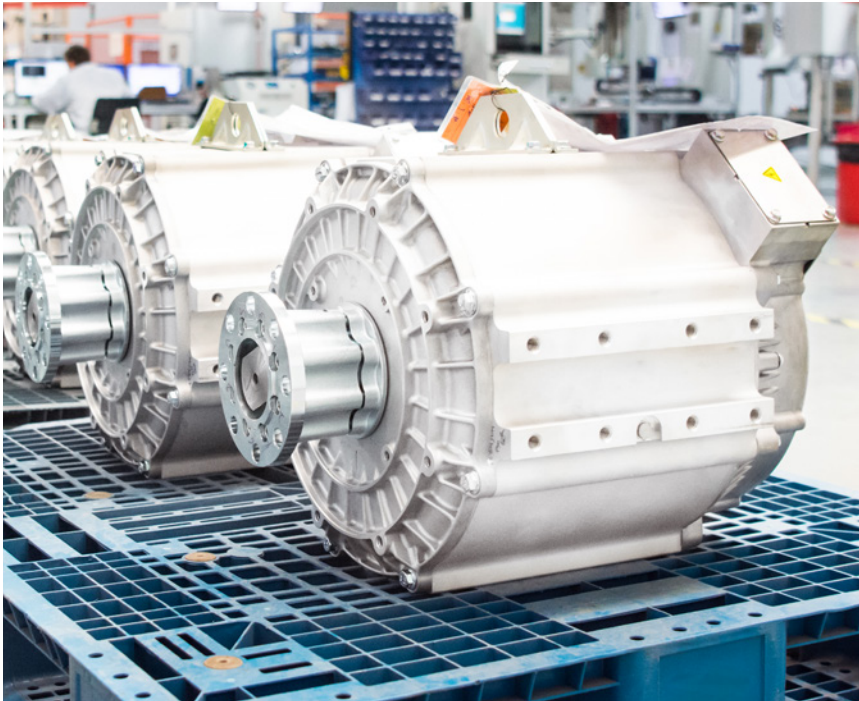
# e-Powertrain Products



## General Information

Supported by a legacy of innovation in conventional drivetrains, Dana has the electrified system solutions to meet any OEM's needs wherever they are in their electrification development.

# Dana TM4<sup>®</sup> SUMO



## Applications

- City buses
- Delivery trucks
- Tow tractors
- Mining
- Marine applications
- Shuttles
- Other heavy duty vehicles

## SPECIFICATIONS

600 Vdc, 30 seconds or more, 45°C

	MOTOR + INVERTER	PHASES	PEAK POWER (kW)	CONTINUOUS POWER (kW)	PEAK TORQUE (Nm)	CONTINUOUS TORQUE (Nm)	MAX OPERATING SPEED (RPM)
<b>SUMO MD</b>	<b>SUMO MD HV1500-3P</b>	3	162	100	1590	680	3250
	<b>SUMO MD HV1800-3P</b>	3	170	100	1770	680	3250
	<b>SUMO MD HV2200-3P</b>	3	200	145	2200	1150	2700
	<b>SUMO MD MV2500-6P</b>	6	230 <sup>1</sup>	115	2500	1140	3000
	<b>SUMO MD HV3000-6P</b>	6	235	140	3255	1065	3000
	<b>SUMO MD HV2400-6P</b>	6	240	120	2300	605	3500
	<b>SUMO MD HV2100-6P</b>	6	250	132	2150	685	3500
	<b>SUMO MD HV2200-6P</b>	6	255	190	2355	990	3700
	<b>SUMO MD HV2600-6P</b>	6	265	155	2760	970	3500
<b>SUMO HD</b>	<b>SUMO HD HV2700-9P</b>	9	250	195	2700	2060	3375
	<b>SUMO HD HV3400-9P</b>	9	250	195	3400	2060	2450
	<b>SUMO HD HV3500-9P</b>	9	350	260	3500	1830	3400

<sup>1</sup>350 Vdc, 30 seconds, 45°C  
Specifications are subject to change

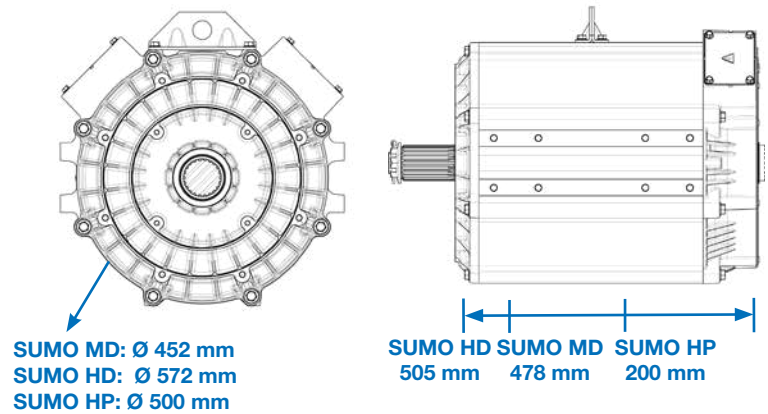
# Dana TM4<sup>®</sup> SUMO



## WEIGHT AND DIMENSIONS

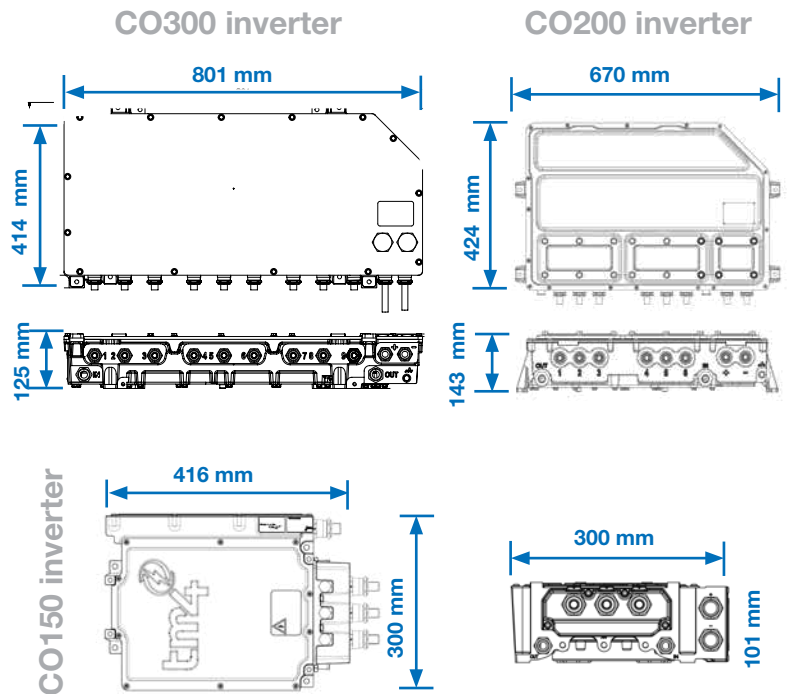
SYSTEM	PART	WEIGHT (kg)	LENGTH (mm)
<b>SUMO HD-9P</b>	LSM280 motor	340	505
	CO300 inverter	36	801
<b>SUMO MD-6P</b>	LSM200 motor	212	478
	LSM140 motor	180	419
<b>SUMO MD-3P</b>	CO200 inverter	26	670
	LSM110 motor	180	411
	CO150 inverter	11	416

## Motors/generators



## STANDARDS

Automotive components	AEC-Q100 AEC-Q101 ACE-Q200
Electromagnetic compatibility EMC	Main automotive international standards
System protection	IP6K5 (IP69K optional)
Toxic materials and flammability	ROHS, ELV, UL94-VO



# Dana TM4<sup>®</sup> CO150



## INVERTER FEATURES

### HARDWARE FEATURES

- High power and current densities
- Uses Reflex<sup>™</sup> gate driver technology
- Multiple resolver/encoder compatibility
- Multiple terminal options
- High efficiency
- Variable switching frequency

### OTHER

- The CO150 is also offered as a auxiliary inverter

### SOFTWARE FEATURES

- Sinusoidal motor current
- Temperature sensing for system derating
- Communication fault detection
- CAN 2.0b communication interface
- Torque or speed control
- Advanced control algorithm for optimal power module usage and efficiency
- Compatible with Dana TM4's ODIN advanced diagnostic software suite

## SPECIFICATIONS

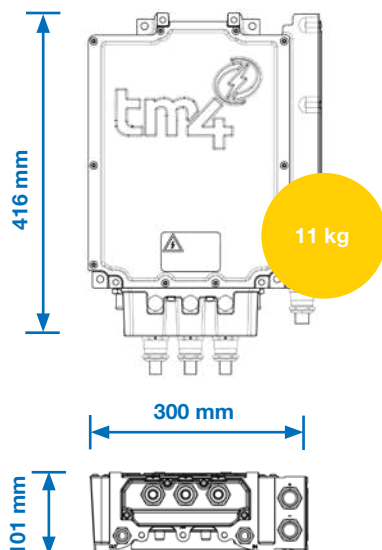
INVERTER	Max electrical output power	Max output current	Max blocked rotor current	Max electrical frequency	Performance voltage
CO150	150 kW <sup>1</sup>	575 Arms	650 Adc	1.25 kHz	320-450 Vdc
CO150HV	170 kW <sup>2</sup>	350 Arms	375 Adc	750 Hz	500-750 Vdc

Specifications are subject to change

<sup>1</sup> 450 Vdc, 30 seconds, 65°C

<sup>2</sup> 750 Vdc, 30 seconds, 65°C

## DIMENSIONS



## MULTI-PHASE OPTION

Dana TM4 also offers its CO200 6 phase and CO300 9 phase inverters as an alternative for high power electric & hybrid vehicle motor / generator control needs.



CO200



CO300

# Dana TM4<sup>®</sup> CO150-HVF



## INVERTER FEATURES

### HARDWARE FEATURES

- High power and current densities
- Uses Reflex<sup>™</sup> gate driver technology
- Configurable voltage and frequency  
3-phase output
- High efficiency (97.5%)
- Uses proven CO150 motor controller platform
- CAN communication

### SOFTWARE FEATURES

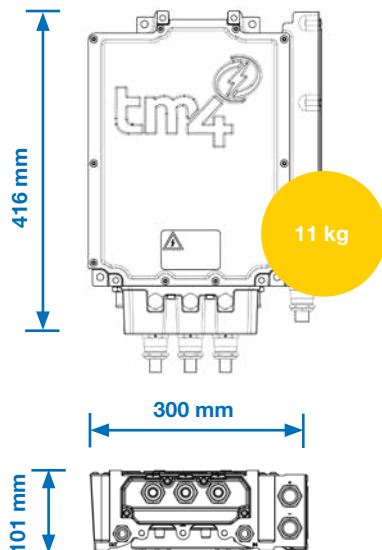
- Temperature sensing for system protection
- Advanced diagnostic capabilities  
(Dana TM4 ODIN)
- Switching fault detection
- Client configurable parameters
  - AC V/f ratio
  - AC current limit
  - DC voltage limits
  - Load parameters
- Dynamic control over CAN
  - Soft start/stop
  - AC frequency (open loop speed control of AC motors)
  - Field rotation direction

## SPECIFICATIONS

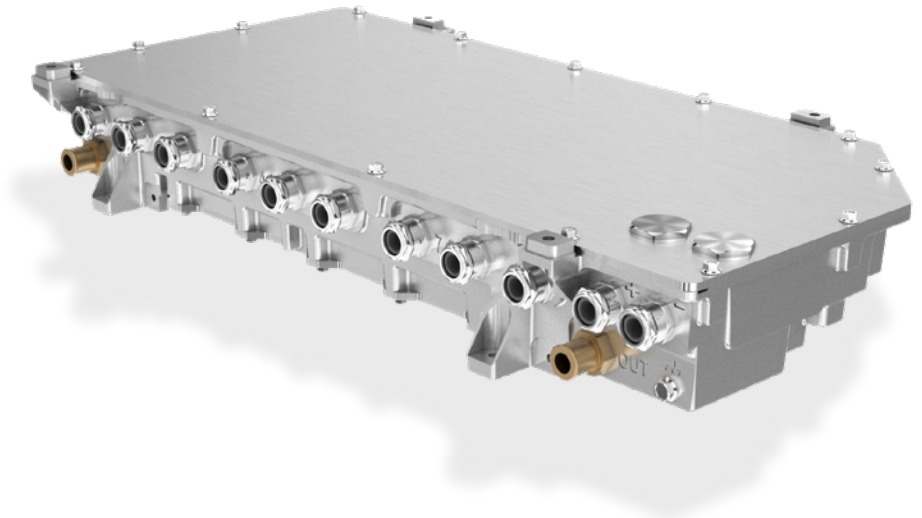
INVERTER	Max electrical output power	Max output current	Operating battery voltage	Output frequency	Auxiliary supply voltage (nominal)	Max switching frequency
CO150-HVF	116 kVA <sup>1</sup>	0-200 Arms	300-750 Vdc	0-500 Hz	12-24 Vdc	16 KHZ

Specifications are subject to change  
<sup>1</sup>500 Vdc, 30 seconds, 65°C

## DIMENSIONS



# Dana TM4<sup>®</sup> C0300 Inverter



## Inverter Features

- 9-phase motor controller/inverter
- High power and current density
- Uses Dana TM4<sup>®</sup> REFLEX<sup>™</sup> gate driver technology
- Multiple resolver/encoder compatibility
- Operating voltage: 500-750 VDC
- Four-quadrant operation
- High efficiency
- Variable switching frequency
- Compatible with brushless resolvers (Tamagawa, LTN, and others)

## Software Features

- Sinusoidal motor current
- Temperature sensing for system derating and alarms
- Compatible with Dana TM4<sup>®</sup>'s ODIN advanced diagnostic software suite
- Communication fault detection
- CAN 2.0b communication interface
- Torque or speed control
- Advanced control algorithm for optimal power module usage and efficiency

# Dana TM4<sup>®</sup> BCI20



## SPECIFICATIONS

### Charger mode

Characteristics	450 VDC	800 VDC*
<b>Charging control modes</b>	Power DC Voltage DC Current AC Current	
<b>AC input</b>		
<b>Operational voltage range</b>	96-264 V <sub>AC</sub>	
<b>Max current</b>	80 A <sub>RMS</sub>	
<b>Efficiency</b>	>92%	
<b>Power Factor</b>	>98%	
<b>DC output</b>		
<b>Output power</b>	15 kW @ 208 V <sub>AC</sub> 18 kW @240 V <sub>AC</sub>	
<b>Operational voltage range</b>	200-450 V <sub>DC</sub>	400-850 V <sub>DC</sub>
<b>Protection</b>	Over & Undervoltage shutdown Overcurrent protection Thermal derating	

### Inverter mode

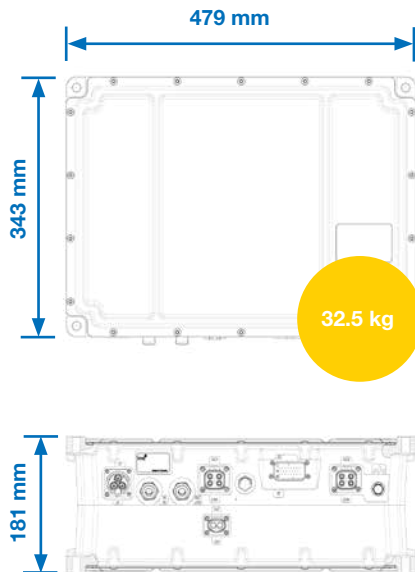
Characteristics	450 VDC	800 VDC*
<b>Output control mode</b>	V/f	
<b>AC output</b>		
<b>Line-line voltage (3 phases)</b>	10 to 208 V <sub>RMS</sub>	
<b>Number of outputs</b>	2 (independent)	
<b>Power</b>	9 kVA per output	
<b>Frequency</b>	1 to 500 Hz	
<b>Maximum current</b>	27 A <sub>RMS</sub>	
<b>Efficiency</b>	>90%	
<b>DC input</b>		
<b>Operational voltage range</b>	300-450 V <sub>DC</sub>	600-850 V <sub>DC</sub>
<b>Protection</b>	Over & Undervoltage shutdown Overcurrent protection Thermal derating	

Standards	
<b>Standards</b>	FCC part 15, CISPR25, ISO11452-4, ISO7637-2/-3, ISO16750-2, IEC 61000-6-1, ISO 10605, 2004/104/EC, IEC 61851-21, IEC61851-1
<b>EVSE compatibility</b>	SAE J1772
<b>Insulation</b>	AC to chassis: 1500 V <sub>ac</sub> DC to chassis: 2600 V <sub>ac</sub> AC to DC: 1900 V <sub>ac</sub> (MV) or 2600 V <sub>ac</sub> (HV)

Environmental & cooling features	
<b>Coolant temperature Ambient temperature Storage temperature</b>	-40°C to 85°C
<b>Cooling system</b>	40% water / 60% glycol
<b>Ingress protection</b>	IP67
<b>Shock &amp; vibration standards</b>	GMW3172

\*preliminary (available Q2 2018) Specifications are subject to change

## DIMENSIONS





# Dana TM4<sup>®</sup> NEURO 200

## HARDWARE CHARACTERISTICS

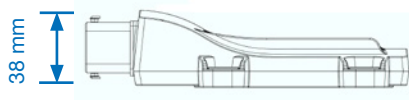
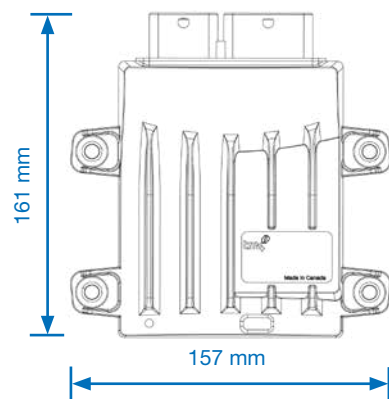


FEATURES	
<b>Processor</b>	<b>Texas Instruments TMS570LC4357</b> Dual-Core 300Mhz Lockstep CPU ARM Cortex-R5F 4MB Flash with ECC 512KB of RAM with ECC 32-Bit RISC
<b>Connector</b>	Molex CMC 80 pins
<b>Communication</b>	4 CAN 2.0b and 1 optional LIN
<b>Material</b>	Encapsulated with thermoplastic
<b>Optional features</b>	Wi-Fi single-band 2.4 GHz Real-time clock LIN Additional EEPROM External Flash

INPUTS		OUTPUTS	
<b>Analog inputs</b>	8 general purpose	<b>High-side outputs</b>	4 x 1.5A with current sensor 2 x 3A with current sensor
<b>Digital Inputs</b>	14 configurable (active low or high)	<b>Low-side outputs</b>	10 x 0.5A 4 x 0.1A 2 x 2A <small>can be used as a PWM</small>
<b>Temperature sensors</b>	2 configurable RTD100 or RTD1000 1 configurable NTC or KTY 1 dedicated KTY	<b>Indicator</b>	1 green Power Good 1 green user controlled 2 red user controlled

OTHER SPECIFICATIONS	
<b>Weight</b>	0.50 kg
<b>Operating voltage range</b>	8 - 32 V <sub>dc</sub>
<b>Operating temperature</b>	-40°C - 85°C
<b>System protection</b>	IP6k9k
<b>Wireless communication</b>	IEEE 802.11 b/g/n

# DIMENSIONS



# Service and Support



## Online Support

### Dana Support 24 Hours a Day at [dana.com/cv](http://dana.com/cv)

Our website is your “virtual” Dana support vehicle. Whether you are a truck maker, dealer, distributor, owner or driver, you can find instant answers when you need them most.

On [dana.com/cv](http://dana.com/cv) you can quickly and conveniently find:

- The latest service updates
- The Dana literature library
- Approved Dana lubricants
- Warranty information

#### Information at Your Fingertips

Bookmark [dana.com/cv](http://dana.com/cv) to your web browser today. This will help you quickly access our comprehensive website containing valuable service material whenever you need it.

#### You can also sign up for the free Dana e-newsletter.

You'll receive automatic Dana drivetrain updates to keep you in the know with money-saving and money-making news.

#### Training

Our expert and onsite drivetrain consultants are the most experienced in the business. We're here to help you with any of your drivetrain needs.

#### Aftermarket

Our support team helps keep your vehicles running like new with aftermarket support. We can offer a wide range of solutions to fit your needs, from genuine to value-added replacement parts.

#### Specs and More

From detailed product information to unparalleled customer support, [dana.com/cv](http://dana.com/cv) has everything you need for your business.



#### EXPERT SUPPORT

- Dedicated call center
- Dedicated applications and engineering contacts
- Localized inventory for truck down support
- Training resources
- Detailed product analysis



#### 24-HOUR AVAILABILITY

- Online access to technical and product literature
- Electronic application approval requests
- Anytime access to digital product tutorials



#### WARRANTY SUPPORT

- Strong coverage
- Equitable repair times
- Extended protection plan service
- Dana real-time warranty process



#### TECHNOLOGY LEADERS

- Direct access to a world leader in drivetrain technology
- Award-winning technologies
- Next generation support tools

# Service and Support

## Warranty Requirements

### Warranty

From the instant you develop drivetrain specifications, the Dana team provides easy-to-understand warranty coverage based on the vehicle's intended use, which means fairer and faster warranty administration.

#### Matching Coverage to Use

Dana plans set the standard for the most comprehensive drivetrain warranty coverage in the trucking industry. The Dana Warranty Manual gives a comprehensive look at what drives Dana Warranty Coverage for the U.S. and Canada. By matching the vehicle type to the job to be performed, the Dana Warranty Manual accurately and fairly aligns warranty coverage.

#### Warranty Claim Procedures and Guidelines

Filing a warranty claim can be a confusing process that oftentimes leads to reduced or rejected claims if some or all of the requirements are not met. To receive your maximum reimbursement in a timely manner, be sure to read through the Claim Procedures section of the Warranty Manual before you begin the warranty claim process.

#### Dana Real-Time Warranty

The Dana Real-Time Warranty System saves time for more than 800 dealers in the U.S. and Canada with over-the-phone warranty claim approval and online claim status tracking. [warranty.dana.com](http://warranty.dana.com)

#### Dana Support System

The Dana Call Center plays a major role in the support of Dana products. The Call Center is made up of two different teams: the General Tech Team and the Real-Time Warranty Team.

You can reach a Call Center Representative from anywhere in North America by dialing 1-877-777-5360.

### Extended Protection Plans

#### Expanded Lineup of Extended Protection Plan Offerings from Dana

Keeping your truck on the road is critical to your livelihood. Dana Extended Protection Plans give you peace of mind knowing that, despite increasing parts and labor costs, or how severe the work conditions are, you can repair your truck to its original standard of quality.

Dana offers Extended Protection Plans for axles and 100% of parts and labor on all warrantable failures. For a relatively modest investment, you can rest easy knowing that Dana is there to support you throughout the life of your truck. You choose the protection that meets your needs.

### Packages

Full coverage is provided for all Spicer® heavy- and medium-duty drive axles.

EPP - Steer Axles (PDF)

EPP - Drive Axles (PDF)

All Vocations – Extended Protection Plans cover all drivetrain components, regardless of the severity of use in your industry, including logging and mining vehicles.

Single Year Coverage Available – Dana Extended Protection Plans may be purchased for as little as a single year, so you do not have to purchase coverage for longer than you expect to own your vehicle.

Warranty Coverage for U.S. and Canada Only

Please contact your Dana Representative for additional information at 1-877-777-5360.

### Benefits

#### Full Warranty Protection

Full parts and labor on warrantable failures.

#### Service Available at All OEM Dealer Facilities

With our Extended Protection Plans, you are never far from parts and service, with over 3,500 dealers in the U.S. and Canada.

#### Genuine Parts

All replacement parts will be genuine Dana parts, so you know your repaired vehicle will have the same outstanding quality it had when it was first purchased.

#### Simple Payment Options

You can purchase a Dana Extended Protection Plan by rolling it into the financing of your new vehicle, or simply fill out the online registration form and pay by check. Peace of mind has never been easier to obtain.

#### Protection from Cost Inflation

Your Extended Protection Plan covers all repairs to your vehicle's drivetrain, regardless of increases in parts or labor that are certain to occur over time. One simple payment now can save you substantial repair charges in the future.

#### Enhanced Resale Value

Repairing your vehicle with genuine Dana parts increases its resale value. Plus, your extended warranty coverage is transferable, further enhancing your resale value.

Notes

Lined writing area with 22 horizontal lines.





# Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---



## **SPICER®**

*Drivetrain Systems*

Axles

Driveshafts

Transmissions

## **VICTOR REINZ®**

*Sealing Products*

Gaskets and Seals

Cylinder-Head Cover Modules

Thermal-Acoustical Protective Shielding

## **LONG®**

*Thermal Products*

Transmission Oil Coolers

Engine Oil Coolers

Battery Coolers



*e-Drive Systems*

e-Powertrain

System Software and Controls



## About Dana Incorporated

Dana is a world leader in highly engineered solutions for improving the efficiency, performance, and sustainability of powered vehicles and machinery. Dana supports the passenger vehicle, commercial truck, off-highway, and industrial markets as well as industrial and stationary equipment applications. Founded in 1904, Dana employs thousands of people on six continents who are committed to delivering long-term value to customers.

## About Dana Commercial Vehicle Systems

Dana serves commercial-vehicle customers worldwide with over 40 facilities and five technical centers in 11 countries that design, market, and manufacture complete systems for medium and heavy-duty trucks.

We continuously illustrate our commitment to the commercial-vehicle industry by introducing new products with enhanced, award-winning technologies, including Spicer® axles and driveshafts; Victor Reinz® sealing systems; Long® thermal-management products; and Spicer® Electrified™ e-Powertrain products.

We back our offerings with world-class after-sales support and genuine service parts manufactured to the same high standards as original-equipment products to maximize the return on investment for your commercial vehicle.

For spec'ing or service assistance, call 1-877-777-5360 or visit our website at [dana.com/cv](http://dana.com/cv)

### Dana Commercial Vehicle Driveline Technologies

3939 Technology Drive

Maumee, Ohio, USA 43537

[dana.com/cv](http://dana.com/cv)



## **SPICER®**

*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.

Printed in USA