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FLB COE
> FLD Conventional
> Business Class
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> Argosy COE
Cargo
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> 108SD/114SD

Freightliner Service Bulletin

General Information

Freightliner front and drive axle alignment specifications are consistent with Technology and Maintenance Council (TMC) Recommended Practice 642B. When checking or adjusting axle alignment with Hunter or Bee Line equipment, use the measurements given in this bulletin. For more information and manual procedures, reference **Section 33.00** (front axle) and **Section 35.00** (rear axle) in the applicable workshop manual; for an FLD vehicle, reference **Section 33.03** (front axle) and **Section 35.03** (rear axle) in the service manual.

IMPORTANT: For vehicle alignment to be accurate, the shop floor must be level in every direction. The turn plates for the front wheels must rotate freely without friction, and the alignment equipment must be calibrated every three months by a qualified technician from the equipment manufacturer. Freightliner dealers must have proof of this calibration history.

IMPORTANT: Before starting axle alignment procedures on a vehicle equipped with a Freightliner AirLiner® rear suspension, check the ride height and make any necessary adjustments until it is within specification. See **Group 32** in the applicable workshop or service manual.

NOTE: For optimum tire life, it is recommended that an all-axle alignment be done by a qualified service provider between 15,000 and 30,000 miles (24 140 and 48 280 km), but no later than 90 days after a vehicle is put into service.

Rear Axle Alignment

Thrust ("from Perpendicular")

Ideally, each axle is perpendicular to the vehicle centerline. The "thrust" of an axle refers to its actual orientation in relation to the centerline. See **Fig. 1** and **Fig. 2**. Note that in some cases, this measurement may be referred to as "from perpendicular". For target and limit measurements, see **Table 1** and **Table 2**.

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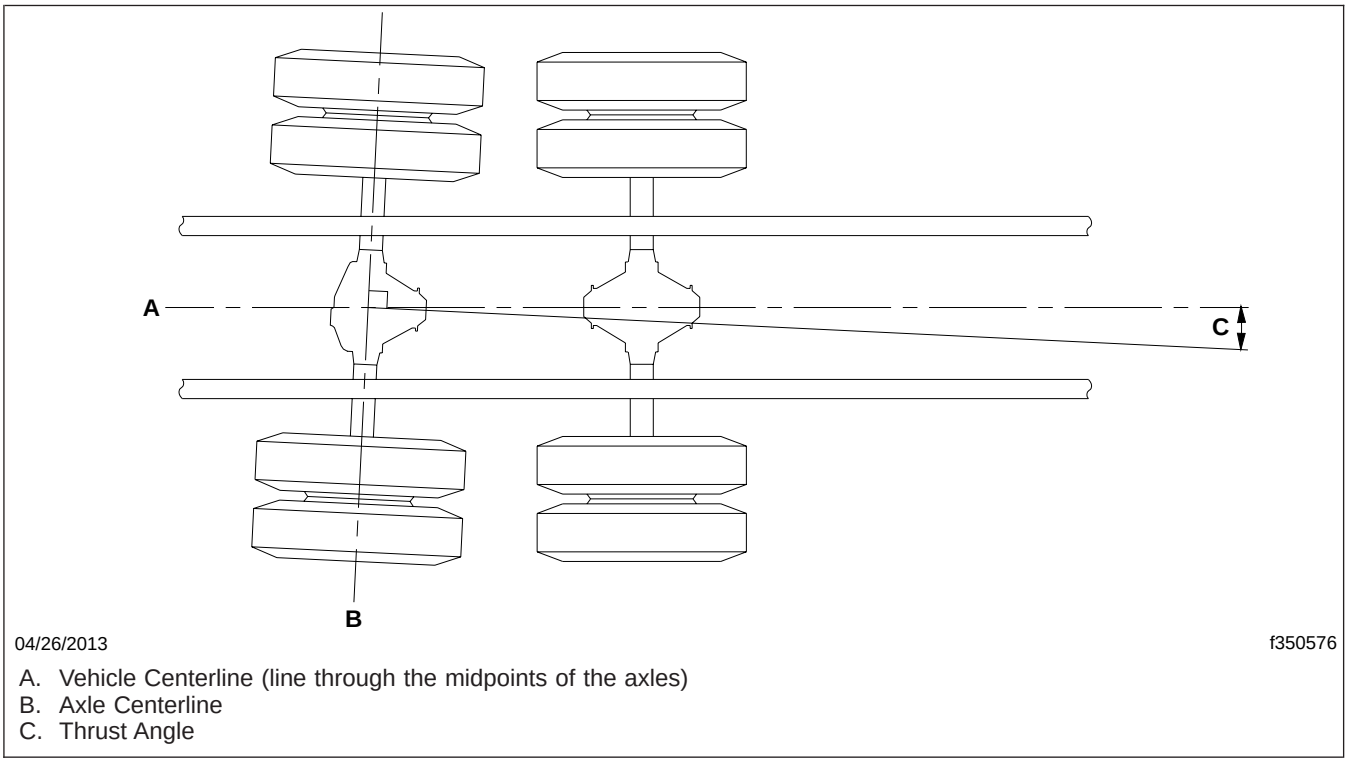


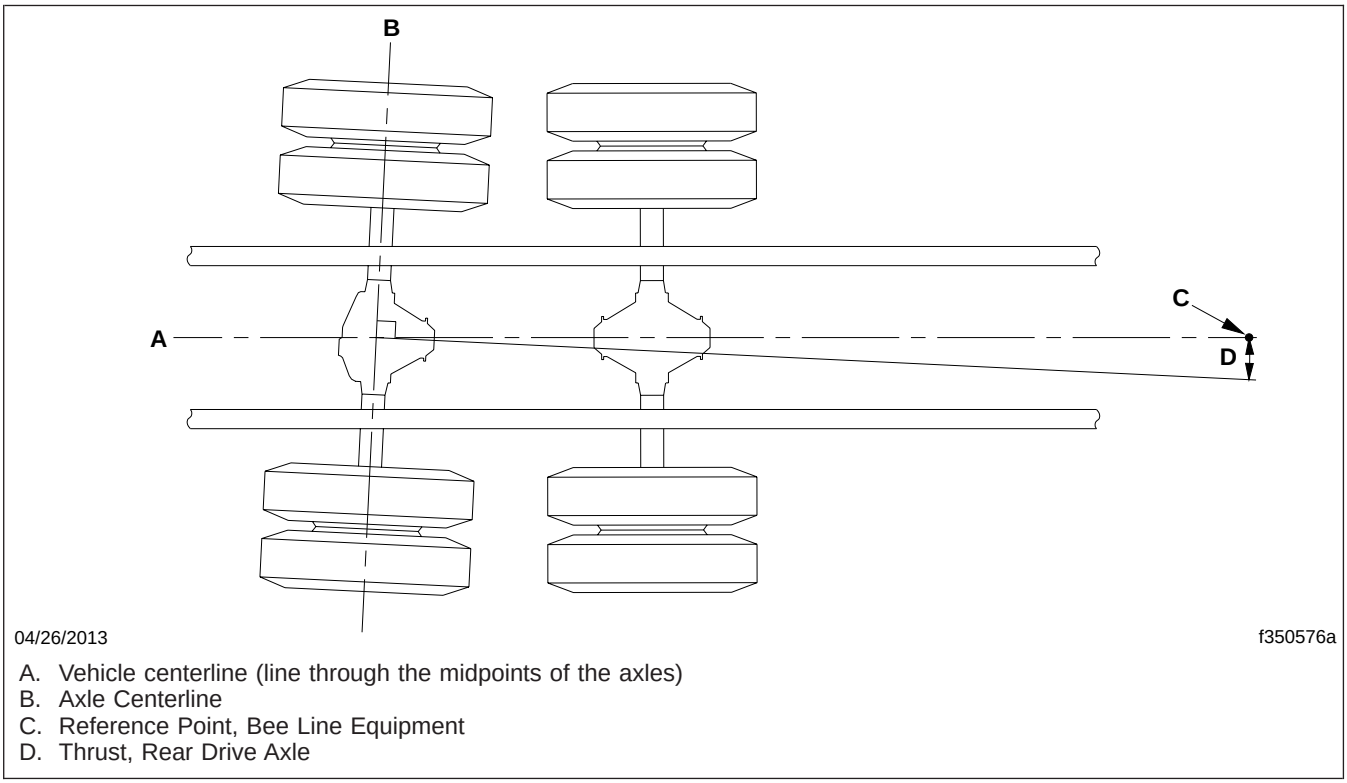
A. Vehicle Centerline (line through the midpoints of the axles)
B. Axle Centerline
C. Thrust Angle

Fig. 1, Thrust Angle, Measured With Hunter Equipment

Thrust, Measured with Hunter Equipment		
Method	**Target: degrees**	**Limit: degrees**
Hunter*	0.00	±0.18

* To use Hunter alignment equipment, refer to the applicable Hunter service literature.

Table 1, Thrust, Measured with Hunter Equipment



A. Vehicle centerline (line through the midpoints of the axles)
B. Axle Centerline
C. Reference Point, Bee Line Equipment
D. Thrust, Rear Drive Axle

Fig. 2, Thrust Measurement, Bee Line Equipment

Thrust, Measured with Bee Line Equipment			
Method	**Distance to Reference Point from Axle: inches (mm)**	**Target: inch (mm)**	**Limit ±: inch (mm)**
Bee Line	90–110 (2286–2794)	0.0 (0.0)	5/16 (8)
	110–130 (2794–3302)		3/8 (10)
	130–150 (3302–3810)		7/16 (11)
	150–170 (3810–4318)		1/2 (13)
	170–190 (4318–4826)		9/16 (14)
	190–210 (4826–5334)		5/8 (16)
	210–230 (5334–5842)		11/16 (17)
	230–250 (5842–6350)		3/4 (19)
	250–270 (6350–6858)		13/16 (21)

Table 2, Thrust, Measured with Bee Line Equipment

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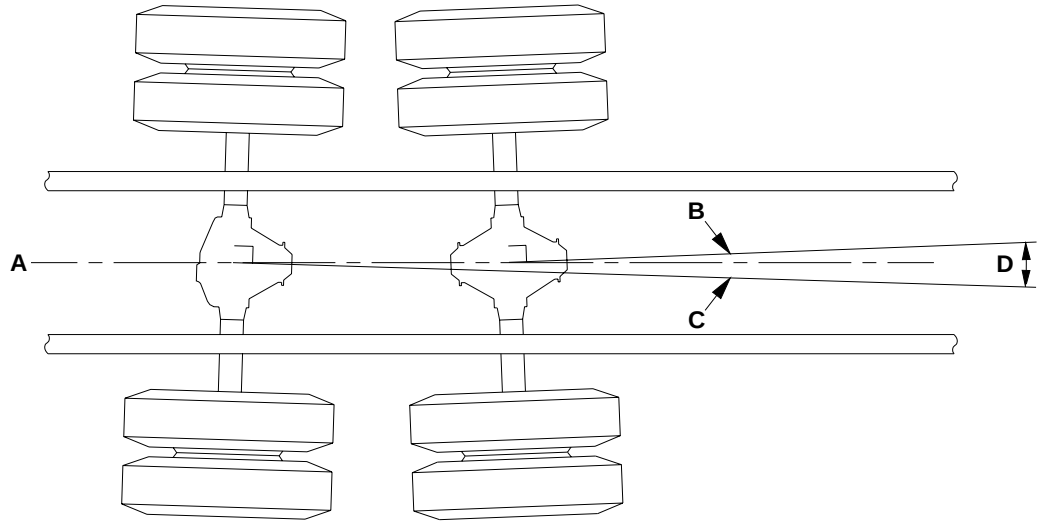
Scrub ("Parallelism")

Ideally, the two axles of a tandem are parallel to one another. The "scrub" (or parallelism) of the axles refers to a deviation from parallel. See **Fig. 3** and **Fig. 4**. Scrub causes the axles to work against each other. For target and limit measurements, see **Table 3** and **Table 5**.



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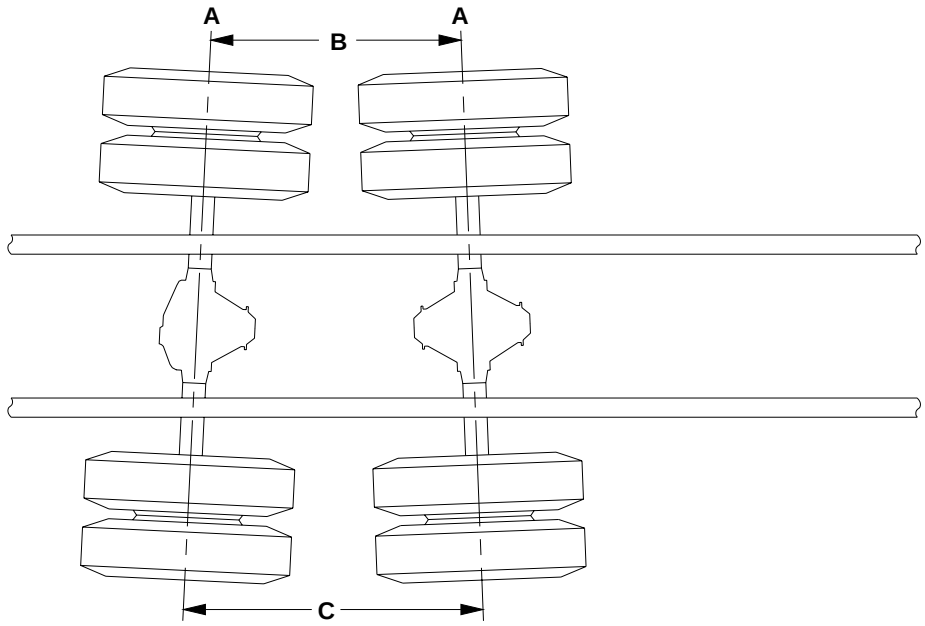
A. Vehicle Centerline
B. Thrust Line, Forward Drive Axle
C. Thrust Line, Rear Drive Axle
D. Tandem Scrub Angle

Fig. 3, Tandem Scrub, Measured With Hunter Equipment

Tandem Axle Scrub, Measured with Hunter Equipment		
Method	**Target**	**Maximum Tolerance**
Hunter	0.00 axle-to-axle difference.	±0.08 degree axle-to-axle difference; reference "D" in **Fig. 3**.

Table 3, Tandem Axle Scrub, Measured with Hunter Equipment



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NOTE: Tandem scrub can be measured by finding the difference in axle end-spacing between the two sides of a tandem axle.

A. Axle Centerline
B. Axle End Spacing, LH
C. Axle End Spacing, RH

Fig. 4, Tandem Scrub, Measured With Bee Line Equipment

Tandem Axle Scrub, Measured with Bee Line Equipment		
Method	**Target**	**Maximum Tolerance**
Bee Line	0.0 (0.0)	±1/8 inch difference in axle end-spacing; reference "C" minus "B" in **Fig. 4**.

Table 4, Tandem Axle Scrub, Measured with Bee Line Equipment

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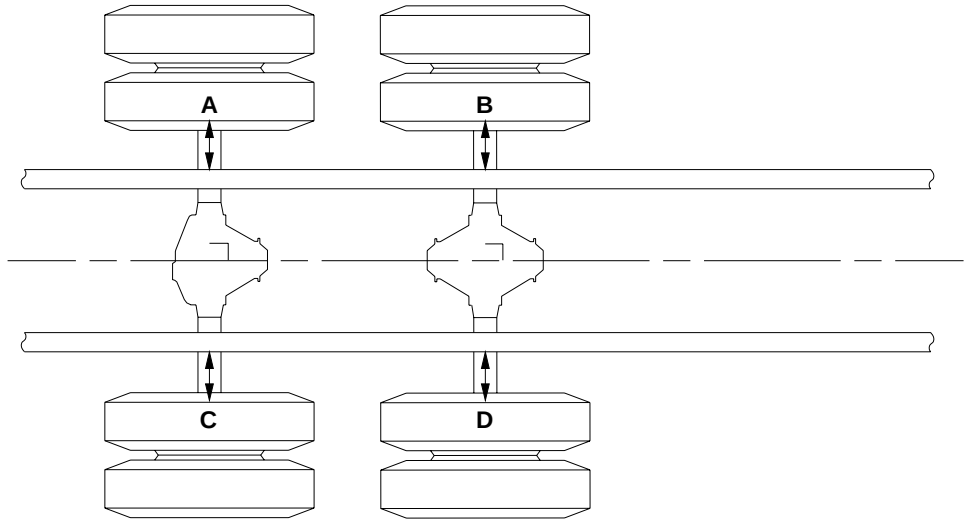
Lateral Offset

Ideally, the vehicle centerline crosses the midpoint of all axles. "Lateral offset" refers to a deviation in the distance from the centerline to the wheel. See **Fig. 5**. For target and limit measurements, see **Table 5**.



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For acceptable lateral offset, measurements B, C, and D must each be within ±1/4 inch (6 mm) of measurement A.

Fig. 5, Lateral Offset Measurements

Lateral Offset, Target and Limit	
Target: inch (mm)	**Limits: inch (mm)**
0.0 (0.0)	±1/4 (±6)

Table 5, Lateral Offset, Target and Limit

Steer Axle Alignment

Toe-In

Wheel toe-in is the distance that the front of the wheels are closer together than the rear of the wheels as viewed from above. See **Fig. 6**. For target and limit measurements, see **Table 6** and **Table 7**.

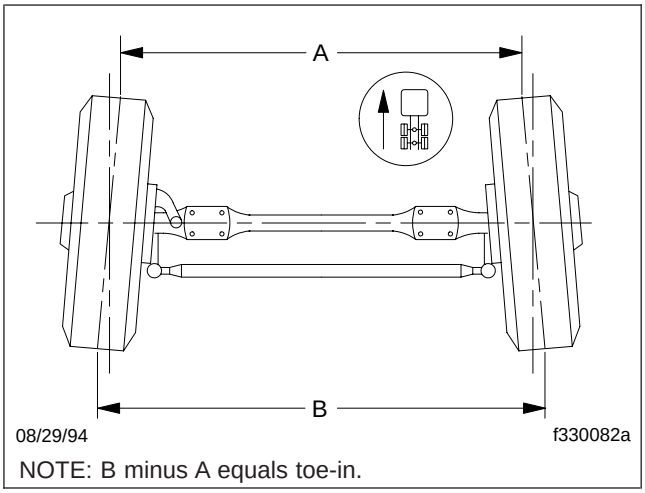

Fig. 6, Wheel Toe-In (overhead view)

Toe-In, Measured with Hunter Equipment	
Target: degrees	**Limits: degrees**
+0.09	0.00 to +0.18

Table 6, Toe-In, Measured with Hunter Equipment

Toe-In, Measured with Bee Line Equipment	
Target: in (mm)	**Limits: in (mm)**
+1/16 (+1.6)	0 to +1/8* (0 to +3.2)

* If adjustment is required, set the toe-in as close as possible to +1/16 inch (+1.6 mm).

Table 7, Toe-In, Measured with Bee Line Equipment

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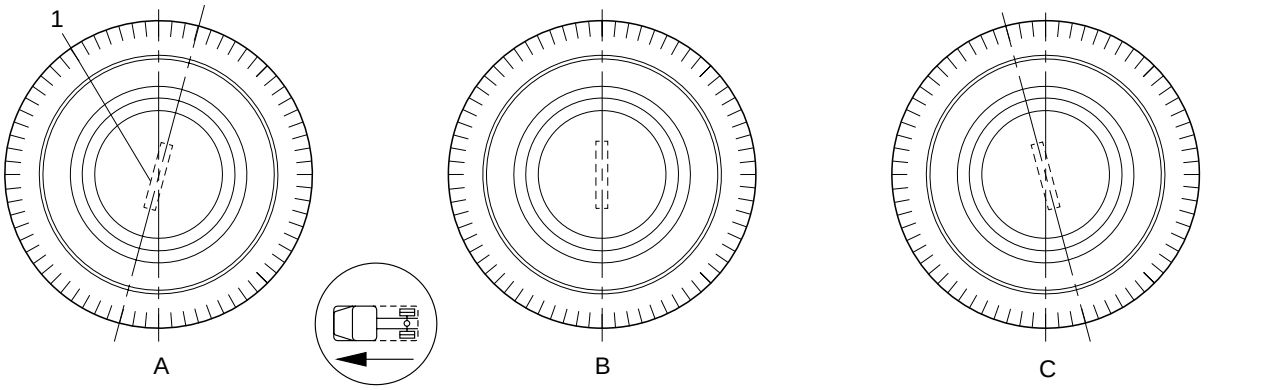
Caster

Caster angle is the tilt of the knuckle pin (or kingpin) as viewed from the side. Caster angle is measured in degrees and is adjustable. A positive caster angle is the tilt of the top of the knuckle pin toward the rear of the vehicle. A negative caster angle is the tilt of the top of the knuckle pin toward the front of the vehicle. Caster angles are based on the design load of the vehicle. See **Fig. 7**. For target and limit measurements, see **Table 8**.



1. Knuckle Pin (King Pin)
A. Positive Caster
B. Zero Caster
C. Negative Caster

Fig. 7, Caster Angle

Caster Target and Limits			
Target (All Models): degrees	**Limits, Hunter Equipment: degrees**	**Limits, Bee Line Equipment**	
		Except LC 4000: degrees	**LC 4000: degrees**
+3-1/2	+2 to +5	+3 to +6-1/2	+2-1/4 to +4-3/4
IMPORTANT: Caster settings for the left and right sides *must* be within 1/2 degree of each other. It is necessary for only one side to be within the specifications given in this table.			

Table 8, Caster Target and Limits

Warranty

This bulletin is informational only. Warranty does not apply.