



SAF TRAILER AIR AND SPRING RIDE SUSPENSIONS APPLICATION GUIDE

AIR AND SPRING RIDE TRAILER SUSPENSION SOLUTIONS
FOR ON AND ON/OFF HIGHWAY TRAILER APPLICATIONS

Introduction.....	2
Items to Consider	3
Applications Guide	
Fixed Frame Suspensions.....	4
Slider Suspensions.....	6

Introduction

This guide provides you with recommendations for on and on/off highway use and other information necessary for the proper selection of a trailer air or mechanical suspension system. For further recommendations for trailer applications not covered in this guide, contact SAF-HOLLAND Trailer Suspension Application Engineering - 888.396.6501.

SAF-HOLLAND USA

800.876.3929
www.safholland.us

SAF-HOLLAND CANADA

519.537.3494

WESTERN CANADA

604.574.7491
www.safholland.ca

SAF-HOLLAND MEXICO

52.55.5362.8743
www.safholland.com.mx

1. Short Haul Applications

Short haul applications such as city pick-up, delivery and milk run pick-up's (typically 30 miles (50km) or less) result in a particularly harsh environment for the operation of tractor trailers. As a result, even though the particular application may meet all of the criteria of a category (e.g. "Standard Duty"), the next higher category will be required (e.g. "Moderate Duty").

2. Inner City Fuel Hauling

Inner city fuel haul applications result in a particularly harsh environment for the operation of tractor trailers. As a result, even though the particular application may meet all of the criteria of a category (e.g. "Standard Duty"), the Severe Duty On-Road category must be used.

3. Dump Trailers

Axle Stops

Trailers used for dump applications with 3 or more axles must have axle stops installed on the rear axle. The load transfer to the rear axle during the loading operation will transfer enough weight to the rear axle to exceed its load rating and potentially damage its longevity. Axle stops are also recommended for tandems. (Axle stops are not provided by SAF-HOLLAND, but are to be incorporated into the trailer design.)

Dump Air

Before discharging a load, the pressure in the air suspension should be "dumped" to allow the load to be transferred to the axle stops. This will ensure trailer stability during the discharging of the load and enhance the life of the air springs and shocks.

4. Low Boy Equipment Trailers

Axle Stops

Trailers used for float/lowboy applications with 3 or more axles must have axle stops installed on the rear axle. The load transfer to the rear axle during the loading operation will transfer enough weight to the rear axle to exceed its load rating and potentially damage its longevity. (Axle stops are not provided by SAF-HOLLAND but are to be incorporated in the trailer design.)

Dump Air

Before loading or unloading, the pressure in the air suspension should be "dumped" to allow the load to be transferred to the axle stops. This will ensure trailer stability during the moving of the load and enhance the life of the air springs and shocks.

5. Severe Environments

Some areas of the country are particularly difficult on the operation of a trailer. This would include most logging roads, chip van environments, steep mountain or steep grades (e.g. 20% or greater) where the vehicle is subjected to extreme conditions. In these applications there are times where alternate components should be considered. Included in this list of alternative components would be shocks with heavy-duty valving and air springs with aluminum pedestals. Please contact your local SAF-HOLLAND representative for additional details.

6. Lift Axles

Raising the lift axle of a fully loaded trailer will result in a load transfer to the remaining axles. The resulting increase in the load carried by the primary suspension causes the air springs to compress and diminish the lift axle's tire clearance. If the load on the primary suspension exceeds the suspension's capacity, the primary air springs can compress fully causing the lift axle's tires to remain in contact with the ground.

Always consult your local SAF-HOLLAND representative when combining lift axles with primary suspensions in multi-axle combinations. Lift axle applications must have a minimum of 4" of up-travel.

NOTE: SAF-HOLLAND does not recommend lifting an axle on a laden trailer. Most jurisdictions have limitations on the lifting of an axle.

7. SwingAlign™ Axle Alignment

SwingAlign™ is standard on all CBX Air Ride Suspensions for the industry's fastest, most accurate and easiest axle alignment. With SwingAlign™ axle re-alignment can be performed without the need to loosen the torque on the front pivot bolt. Axle alignment procedures are now faster than ever before, and without the need for any special tools or welding. SwingAlign™ is standard on the road-side of the suspension.

8. Mixing Suspensions - Full-Air Applications

SAF-HOLLAND recommends the same air suspension capacity be used on all trailer axles to ensure proper axle load equalization (i.e. if a CBX25 25k is used on the primary suspensions, a CBX25 25k or CBX25u 25k should be used on the lift or steer axles).



AIR SUSPENSIONS - FIXED FRAME APPLICATION GUIDE																AIR SUSPENSIONS - FIXED FRAME APPLICATION GUIDE																									
SUSPENSION SYSTEMS All CBX Suspension Models Feature Trailing Arms Welded to Axles					CONVERTER DOLLY		VAN (Non Live Floor)				FRAME					OPEN TOP OR VAN WITH LIVE FLOOR						SHELL					SKELETON														
					Single Axle	Tandem Axle	Dry Van Reefer Van	Drop Frame Furniture Van	Chip Van	Paper Haul	Livestock	Platform		Curtainside	Equipment Lowboy	Extendable Axle	Container	Logging Chassis	Chip Van Logging	Transfer Trailer Tilt or Walking Floor	Belt Unload Rear Discharge	Grain		Dump		Bulk Hopper	Tanker		Crude Oil Tanker	Pup Trailer with Single Lunette Eye	Tanker 3+ Axles and/or B-Train and/or "High C.G."	Auto Hauler									
Style	Model (axle rating/suspension)	Ride Heights	Liftable ⁴	Axles	ON-HIGHWAY - Less Than 10% Off-Highway (paved roads, maintained unpaved roads)																																				
CBXA AeroBeam Top Mount	CBXAN23-245 ³ (23K/23K)	14-17"	Yes ¹	1, 2, 3																																					
	CBXAS23-245 (23K/23K)	14-17"	Yes	1 or Multi																																					
	CBXAS25-245 (25K/25K)	14-17"	Yes	1 or Multi																																					
	CBXAS30-245 (25K/30K)	14-17"	Yes	1 or Multi																																					
CBX Top Mount	CBX23-317 (23K/23K)	14-17"	Yes	1 or Multi																																					
CBXU Underslung	CBX23U (23K/23K)	6-14" ²	Yes	1 or Multi																																					
	CBX25U (25K/25K)	6-14" ²	Yes	1 or Multi																																					
	CBX25/30U (25K/30K)	6-14" ²	Yes	1 or Multi																																					
CBXAS-SSA AeroBeam Self-Steering Axle	CBXAS-SSA23 (23K/23K)	14-19"	Yes	1 or multi																																					
	CBXAS-SSA25 (25K/25K)	14-19"	Yes	1 or multi																																					
	CBXAS-SSA25/30 (25K/30K)	14-19"	Yes	1 or multi																																					
CBXA AeroBeam Top Mount	CBXAS25-245 (25K/25K)	14-17"	Yes	1 or Multi																																					
	CBXAS30-245 (25K/30K)	14-17"	Yes	1 or Multi																																					
	CBXU Underslung	CBX25U (25K/25K)	6-14" ²	Yes	1 or Multi																																				
	CBXU Underslung	CBX25/30U (25K/30K)	6-14" ²	Yes	1 or Multi																																				
CBXAS-SSA AeroBeam Self-Steering Axle	CBXAS-SSA25 (25K/25K)	14-19"	Yes	1 or multi																																					
	CBXAS-SSA25/30 (25K/30K)	14-19"	Yes	1 or multi																																					
					ON/OFF-HIGHWAY - More Than 10% Off-Highway (rough and unmaintained roads)																ON/OFF-HIGHWAY - More Than 10% Off-Highway (rough and unmaintained roads)																				

R - Min. Required suspension and axle for listed application. 1 - CBXAN23 14" ride height is non-liftable. 4 - PosiLift for liftable CBXA AeroBeam top mount and underslung suspensions. CBL or HD PosiLift for liftable CBXSSA suspensions.
 O - Optional suspension and axle for listed application. 2 - 6" ride height is non-liftable. 6" & 7" ride height requires additional frame clearance. 5 - CBXy25 and CBXy25/30, yoke mount available for mating with CBXu25 underslung model, on lowboy trailers.
 Blank - Suspension and axles are not intended for the application. 3 - CBXAN23-245 23K is not approved with self steer axles. Refer to page 7 - Application duty usage approval required from SAF-HOLLAND Trailer Suspension Application Engineering.

MECHANICAL SUSPENSION - FIXED FRAME APPLICATION GUIDE																MECHANICAL SUSPENSION - FIXED FRAME APPLICATION GUIDE																									
SUSPENSION SYSTEMS DuraLite Suspension Capacity Up to 25,000 lbs./axle with Properly Specified Leaf Springs, Axles, Brakes, and Wheel Ends					CONVERTER DOLLY		VAN (Non Live Floor)				FRAME					OPEN TOP OR VAN WITH LIVE FLOOR						SHELL					SKELETON														
					Single Axle	Tandem Axle	Dry Van Reefer Van	Drop Frame Furniture Van	Chip Van	Paper Haul	Livestock	Platform		Curtainside	Equipment Lowboy	Extendable Axle	Container	Logging Chassis ⁶	Chip Van Logging	Transfer Trailer Tilt or Walking Floor	Belt Unload Rear Discharge	Grain		Dump		Bulk Hopper	Tanker		Crude Oil Tanker	Pup Trailer with Single Lunette Eye	Tanker 3+ Axles and/or B-Train and/or "High C.G."	Auto Hauler									
Style	Model (axle rating/suspension)	Ride Heights	Axle Included	Axles	ON-HIGHWAY - Less Than 10% Off-Highway (paved roads, maintained unpaved roads)																																				
DLX	DLX25 (25K/25K)	4.5-17"	Yes	1, 2, 3																																					
DuraLite	25 (- / 25K)	4.5-17"	No	1, 2, 3																																					

R - Min. Required suspension and axle for listed application. 6 - Also approved for Off-Highway .
 O - Optional suspension and axle for listed application. Refer to page 7 - Application duty usage approval required from SAF-HOLLAND Trailer Suspension Application Engineering.
 Blank - Suspension and axles are not intended for the application.



AIR SUSPENSIONS - SLIDING FRAME APPLICATION GUIDE									
SUSPENSION SYSTEMS All CBX Suspension Models Feature Trailing Arms Welded to Axles					DRY VAN AND REEFER TYPE (non-paper haul)			DRY VAN PAPER HAULER	
					Tandem 49" Axle Spacing	Tri-Axle 60" Axle Spacing 72" Axle Spacing		Tandem 49" Axle Spacing	Tri-Axle 60" Axle Spacing 72" Axle Spacing
					ON-HIGHWAY – Less Than 10% Off-Highway (paved roads, maintained unpaved roads)				
Style	Model (axle rating/ suspension)	Ride Heights ¹	Liftable ²	Axles					
CBXA AeroBeam	CBXA40 (23K/40K)	16, 16.5, 17, 18"	Yes Front	2	R				
CBX	CBX46 (23K/46K)	16, 16.5, 17, 18"	Yes Front	2	O			R	
	CBX50 (25K/50K)	16, 16.5, 17, 18"	No	2	O			O	
	CBX69 (23K/69K)	16, 16.5, 17, 18"	Yes Front	3		R	R		R R
					ON/OFF-HIGHWAY – More than 10% off-highway (Rough and Unmaintained Roads)				
Style	Model (axle rating/ suspension)	Ride Heights ¹	Liftable ²	Axles					
CBXA AeroBeam	CBXA40 (23K/40K)	16, 16.5, 17, 18"	Yes Front	2					
CBX	CBX46 (23K/46K)	16, 16.5, 17, 18"	Yes Front	2				R	
	CBX50 (25K/50K)	16, 16.5, 17, 18"	No	2	R			R	
	CBX69 (23K/69K)	16, 16.5, 17, 18"	Yes Front	3					

R - Min. Required suspension and axle for listed application.
 O - Optional suspension and axle for listed application.
 Blank - Suspension and axles are not intended for the application.
 1 - 16" and 16.5" ride heights are non-liftable.
 2 - Auto-PosiLift for smart axle lift system.
 Refer to page 7 - Application duty usage approval required from SAF-HOLLAND Trailer Suspension Application Engineering.

MECHANICAL SUSPENSION - SLIDING FRAME APPLICATION GUIDE											
SUSPENSION SYSTEMS ULX and ZFX Models Feature Leaf Springs Assembled to Axles					VAN (Non Live Floor)		FRAME				
					Dry Van Reefer Van		Platform Straight Frame Drop Frame		Curtainside	Equipment Lowboy	Extendable Axle
					ON-HIGHWAY – Less than 10% off-highway (Paved Roads, Maintained Unpaved Roads)						
Style	Model (axle rating/ suspension/)	Ride Heights	Axle Included	Axles							
ULX	ULX40 (23K/40K)	13.25 - 18"	Yes	2	R						
UltraLite	40 (- /40K)	13.25 - 18"	No	2	R						
ZFX	ZFX40 (23K/40K)	14-16"	Yes	2		R		R	R	R	
Z-Frame	40 (- /40K)	14-16"	No	2		R		R	R	R	

R - Min. Required suspension and axle for listed application.
 O - Optional suspension and axle for listed application.
 Blank - Suspension and axles are not intended for the application.
 Refer to page 7 - Application duty usage approval required from SAF-HOLLAND Trailer Suspension Application Engineering.

Standard-Duty – On-Highway - Less Than 10% Off-Highway

Road Type: **Less than 10% Off-Highway**
(maintained concrete or asphalt roads)

Weight (GCW): **Less than 95,000 lbs. (43,000 kg.)**
Gross Combination Weight (GCW)

Trailer Type and Axle Limitation:
 Single Trailer **"A" Train—Maximum of 3 axles**
 Tandem axle only (Trailer and dolly converter) **"B" Train—Maximum of 3 axles**
 (Lead and "pup" trailer)

Note: Any trailer used for "short haul" (e.g. city pickup and delivery) is to be considered "Moderate Duty"

Recommended Models	
Air Ride	
CBXA40	
CBXAN23	
CBXU23	
Mechanical	
ULX40	
UltraLite	
ZFX40	
Z-Frame	
DXL	
DuraLite	

Moderate-Duty – Less Than 10% Off-Highway

Road Type: **Less than 10% Off-Highway** (gravel or crushed rock roads)
with balance On-Road (maintained concrete or asphalt roads)

Weight (GCW): **Less than 115,000 lbs. (52,000 kg.)**
Gross Combination Weight (GCW)

Trailer Type and Axle Limitation:
 Single Trailer **"A" Train—Maximum of 4 axles**
 Tandem and Tri-axle only (Trailer and dolly converter) **"B" Train—Maximum of 4 axles**
 (Lead and "pup" trailer)

Note: Any trailer used for "short haul" (e.g. city pickup and delivery) is to be considered "Moderate Duty"

Recommended Models	
Air Ride	
CBX46	
CBX50	
CBX69	
CBX23-317	
CBXAS23	
CBXAS25	
CBXU25	
CBXAS-SSA25	
Mechanical	
DLX	
DuraLite	

Severe-Duty – Less Than 10% Off-Highway

Road Type: **Less than 10% Off-Highway** (gravel, crushed rock, hard
packed dirt, or unimproved / unmaintained roads)

Weight (GCW): **More than 115,000 lbs. (52,000 kg.)**
Gross Combination Weight (GCW)

Trailer Type and Axle Limitation:
 Single Trailer—No Axle Limitations **"A" Train—No Axle Limitations** **"B" Train—No Axle Limitations**

Recommended Models	
Air Ride	
CBXAS25	
CBXU25	
CBXAS-SSA25	
CBXU25/30	
CBXAS-SSA25/30	
CBXAS30	

Severe-Duty – More Than 10% Off-Highway

Road Type: **More than 10% Off-Highway** (gravel, crushed rock, hard
packed dirt, or unimproved / unmaintained roads)

Weight (GCW): **More than 115,000 lbs. (52,000 kg.)**
Gross Combination Weight (GCW)

Trailer Type and Axle Limitation:
 Single Trailer—No Axle Limitations **"A" Train—No Axle Limitations** **"B" Train—No Axle Limitations**

Recommended Models	
Air Ride	
CBXU25/30	
CBXAS-SSA25/30	
CBXAS30	



TRAILER AXLES AND
SUSPENSION SYSTEMS



COUPLING AND
LIFTING SYSTEMS



SUSPENSIONS FOR
TRUCKS AND BUSES



SUSPENSIONS AND
AXLE SYSTEMS



V.ORLANDI
TOWING
SYSTEMS



TRAILER AXLES/SUSPENSIONS,
COUPLING AND LIFTING
SYSTEMS

safholland.com

SAF-HOLLAND, Inc.
800.876.3929

SAF-HOLLAND Canada Limited
519.537.3494
Western Canada 604.574.7491

SAF-HOLLAND Mexico
52.55.5456.8641