

CE GUIDE TO LOWERING YOUR BAY WINDOW BUS

The last few years have seen an explosion in the number of radically lowered Bay Window Buses. We have watched as endless examples are featured in the magazines and built by many professional "Bus Experts" all over the World. In all this time we have never seen any magazine print a word of warning about the implications of slamming a Bay Window Bus. So here it is.

If you are a Bay Window owner or you are about to buy one, it is important you understand the limitations of its Ball Joint (BJ) front suspension when it comes to lowering. To get a better understanding of the Bays system, we need to take a quick look at the Split screens front suspension and why they can be built so low and still with care, work.

Splitscreen buses were equipped with King and Link Pin (K&LP) suspension which is far more adjustable and forgiving than the restricted travel of a ball joint. The Splits K&LP suspension is capable of being lowered much further than a BJ system as it has the huge advantage in that its spindles can be safely "dropped" without any significant loss of strength or radical geometry problems. It is therefore relatively easy for a competent builder to lower a Split Bus with lets say 4" on beam adjusters and another 3.25" on dropped spindles giving it a drop of over 7" on the front and still have a "working" suspension subject to correct shock lengths, sufficient ground clearance etc. There are no restrictive ball joints to limit travel.

The Bay Window is not so easy. Its ball joints have a maximum working travel of approx 70 degrees.

It is usual design practise to allow 2° at either end of the travel as a "Safe Zone" before the joint reaches the danger of reaching full travel. This reduces working travel down to 66°. On a factory front beam there is only 30mm of suspension before you hit the bump stop. If 30mm was VW's chosen maximum travel, its sensible practice to remember this when lowering your Bay. This safe area of travel can be seen in the three examples shown below in the Yellow segments. If your Ball Joint runs out of travel, you will not only get metal to metal contact giving you a terrible ride but you run the risk of Ball Joint failure. If this happens the entire weight of your bus will be transferred onto the joint rather like a slide hammer. If your bus is lowered enough for this to happen once, it is more than likely to do it often. Imagine putting a bolt in a vice and hitting it with the weight of your bus. It will without doubt, eventually fatigue and break. It's only other course is to eventually "pop" the ball of the swivel out of the "crimped" casing. The end result is a catastrophic collapse of your front suspension with total loss of steering and probably front brakes as well. A very sobering thought.

Looking at the amount of slammed bays that are seen at shows, you cannot but wonder if the owner understands what is going on a few inches away from his vital parts. Add to this the very dubious method of dropping or flipping Bay spindles which destroys all factory steering geometry and its hard to understand why any one would even consider building a car this dangerous. There are at the time of writing, no new dropped Bay spindles available that Creative are prepared to endorse. Our recommendations therefore not to lower your bus more than 40mm. At this height we believe you actually improve the ride of your bus by lowering its centre of gravity and because the springs are loaded more, you will achieve a slightly firmer ride which it just enough to reduce excessive roll. It also looks right. We are talking 40mm only. The only safe way to go lower is to install a Splitscreen King and Link Pin system. Take time to study and understand the facts below before becoming the lowest kid on the block. Six feet low.

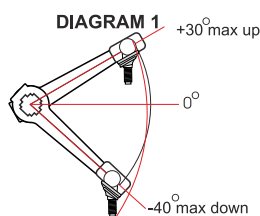


DIAGRAM 2

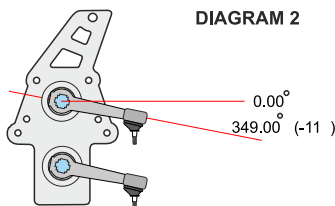


DIAGRAM 3

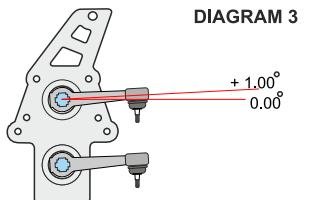
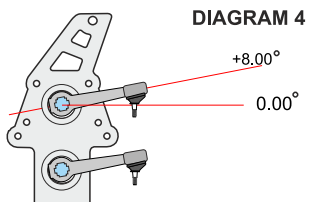


DIAGRAM 4



BALL JOINT DETAIL.

Diagram 1. This shows your Ball Joint delivers approx 70° of travel.

At standard factory height, the suspension allows upward travel of +30 degrees and downward travel of -40 degrees.

Your vehicle height should be such that you never reach maximum travel in either direction. You should allow a minimum of 2mm "Safety Zone" at each end of travel which never gets used in normal driving conditions.

These 2 Safety Zones are shown in red on the following diagrams.

You therefore have 66° of available safe suspension travel.

STANDARD HEIGHT. FULLY BUILT VEHICLE SETTLED ON LEVEL SURFACE.

Diagram 2. At Standard Ride height your trailing arms sit at approx -11 degrees.

Upward ball joint travel available is approximately 45 degrees. (shown in Yellow)

Downward ball joint travel available approximately 21 degrees. (shown in Blue)

You only have approx 30mm of travel before you hit bump stops on an factory beam. Therefore you should allow at least 30mm of travel whatever height your vehicle is set up at.

LOWERED BY 40mm. (1.5") FULLY BUILT VEHICLE SETTLED ON LEVEL SURFACE.

Diagram 3. Your trailing arm now sits at approx +1 degree. It has travelled 12 degrees from stock position.

Upward ball joint travel available is approximately 33 degrees. (shown in Yellow)

Downward ball joint travel available approximately 33 degrees. (shown in Blue)

Therefore with over 30 degrees of travel you are at a safe ride height. Any lower with stock spindles and you are in danger.

You need to have removed all front beam bump stops.

LOWERED BY 62mm. (2.3/8") FULLY BUILT VEHICLE SETTLED ON LEVEL SURFACE.

Your trailing arms now sit at approx +8 degrees. It has travelled 19° from stock position.

Upward ball joint travel available (Yellow) approximately 22 degrees.

Downward ball joint travel available (Blue) approximately 44 degrees.

This is insufficient and will result in your ball joints bottoming out with great impact.

Continual driving in this condition will result in ball joint failure and possible loss of suspension, brakes and steering.

DANGER EXAMPLE ONLY

	SWING ARM ANGLE	UP TRAVEL	DOWN TRAVEL	LOWERED mm.
STANDARD HEIGHT.	-11°	45°	21°	00.00
	-10°	44°	22°	6.00
	-9°	43°	23°	8.00
	-8°	42°	24°	13.00
	-7°	41°	25°	16.00
	-6°	40°	26°	18.00
	-5°	39°	27°	22.00
	-4°	38°	28°	24.00
	-3°	37°	29°	28.00
	-2°	36°	30°	31.00
	-1°	35°	31°	32.00
	00°	34°	32°	36.00
LOWERED BY 40mm.	+1°	33°	33°	40.00
	+2°	32°	34°	43.00
	+3°	31°	35°	47.00
	+4°	30°	36°	50.00
	+5°	29°	37°	53.00
	+6°	28°	38°	55.00
	+7°	27°	39°	59.00
LOWERED BY 62mm.	+8°	26°	40°	62.00
	+9°	25°	41°	66.00
	+10°	24°	42°	69.00
	+11°	23°	43°	73.00

DANGER INSUFFICIENT TRAVEL REMAINING ON BALL JOINTS.