

IRS Axle Kit Install

Our goal is to make the install a breeze. Please read the entire guide before beginning.

KITS SHOULD INCLUDE

- 2 - Control-arm mounting brackets with hardware
- 2 - Upper-shock mount brackets
- 2 - Axles
- 2 - Spring plates
- 2 - Emergency brake cable extenders (gold tubes)
- 1 - Nose cone gasket

TOOLS & SUPPLIES NEEDED

- Protractor (inclinometer)
- Rubber mallet (dead blow)
- Wrenches 10, 11, 13, 17, 19
- Sockets 14, 17, 19, 36
- Allen wrenches 6mm-12 point, 17mm, 3/8"
- 3' carpenters square
- Long straight edge
- Scraper
- Chisel or screwdriver
- Torque wrench
- Degreaser
- Gasgacinch
- CV grease

PARTS NEEDED

Obtain all of the necessary parts before beginning this conversion. The other parts that you will need are a transaxle from an IRS Bug, Ghia, Squareback or Thing (a Thing is best if you can find it) along with the control arms, CV joints, brakes and all the nuts and bolts that hold them on. Also grab the brass union brake on the passenger side and the metal brake line that goes from that union to the T union. You will also need two front brake flex lines from a 65-66 Bug (part #311 611 701B). The transaxle can come from any year IRS car but we find that the 3:88 ring and pinion is too tall and suggest you stay with the 4:12. The 3:88 ring and pinions came in trannys with one side plate (73 on). When you are getting all of these parts be sure and save all of the hardware, every nut and bolt; it's easier to throw bolts away than having to go back to the junkyard and retrieve them.

GETTING READY TO INSTALL THE KIT

If your bus is like any of the ones we've seen, there is 3" of grease all over the forks and torsion housing. Grab the old scraper and a can of degreaser, **not gasoline** and clean away. It is very important that you clean the torsion housing where the brackets are going to bolt on.

To start things off you will need to remove both your engine and transaxle. If your bus or truck is a 1960 or earlier model and still has the original split case transaxle, you'll need a transaxle conversion mount. You can give us a call if you don't already have one.

Now that you have your transaxle out, you should switch your nose cone and hockey stick from your old bus transaxle to the new Bug IRS transaxle. Be sure to install a new nose cone gasket and use some non-silicone sealer, we like a product called Gasgacinch. The nuts are 11mm, don't over tighten them, just snug is fine. Make sure when installing the hockey stick that it is hooked into the grouping of the three selector rods. If one rod is up or down, push it or pull it so that all three line up.

CONTROL - ARM MOUNTING BRACKETS

Now it is time to install the control-arm mounting bracket. There is a left and right side to these brackets. The open side of the box, which the pivot bolt goes through, faces down toward the ground. They should also face the spring plates. The brackets need to slide toward the fork until they are about 5/8" away from each horn that supports the transmission. There are two things that you may need to move around in order to get the brackets in the correct position. One is the heater ducts, the size and location vary a little from year to year, plus VW was not very consistent in their placement even within years. However, the brackets should slide under the ducts. The other thing you may need to move are the two heater-cable tubes, they can safely be bent up and lay on top of the bracket. Make sure the tube is clean where the brackets sit. Once the car is back on the road and you like the way everything is sitting, it's not a bad idea to tack weld the bracket to the torsion housing.

SPRING PLATES

Now to install the spring plates, look for the long cut out section on the spring plate, this goes up with the splines to the outside. The original adjustment on the spring plates was 20 degrees; this of course is measured with the bus being level. The spring plate measurement should be taken with a protractor (inclinometer). If you want your bus to remain close to the stock position set your spring plates at 16 or 18 degrees. This kit requires you to lower the car at least 1" so that the CV's are not over extended. It is possible to get it back to stock height by using Thing stub axles and final drives, along with the larger Type II CV joints. If you want your bus to be lowered all the way down, set your plates at 4 to 6 degrees. This adjustment will leave your bus very low, so depending on what you want to achieve for ride height you will want to adjust your spring plates between 4 and 18 degrees. This measurement needs to be taken on the flat surface of the spring plate just above the holes that secure them to the control arm.

INSTALLING CONTROL ARMS

Grab a control arm and a 17mm Allen bolt and two big washers. Place a washer on each side of the control arm when bolting it to the bracket. Now put the bolt in and tighten it. Use a dull chisel or screwdriver and stake the thin metal ring into the grooves cut into the bolt; this prevents them from backing out. Now swing the arm up to the spring plate and bolt it on with the spring plate on the inside. If you find the spring plate is a ways away from the arm, tap the

bracket in towards the fork. Just snug the bolts for the time being, as the arm will have to be moved for alignment.

GETTING THE ALIGNMENT CLOSE

You will need your friend “Al”, a long straight edge and a 3’ carpenter’s square for this next step. The easiest way we found to do this next step is to place the straight edge against the forks and have “Al” hold the carpenter’s square against the drum. See if the square matches with the straight edge; if not move the arm forward or backward until it does. Be patient and spend some time here to get it done correctly. Do the same thing on the other side. Now tighten the bolts on the spring plates. It is also a good idea to mark the plate and the arm, so that if you ever take it loose again you won’t have to spend a lot of time realigning it. Place your inclinometer on the drum up and down to measure the tilt of the drum. First, make sure the bus is level side to side. The meter should read -2 degrees. This way once a load is put on it, it will level out. If it doesn’t read -2, then rotate the bracket up for negative and down for positive. Do the same thing on both sides and then tighten the brackets and recheck. Now to check your work, bolt the tires on and have “Al” hold a tape measure on a spot in the tread he likes, straighten the tape across the bottom side of the bus from one tire to the other tire. Hold the tape up as close to the frame as possible and take a measurement using a spot you like. Now go to the opposite side and take a measurement. What you are checking is toe in or out on the rear end. You want it as close to zero as possible. If it is off, go back to the step where you used the square. Note: *It is possible to get the correct toe in and not have the tires square to the bus. This is called crabbing.* Once you feel you got it right make sure all bracket bolts, pivot bolts, and spring plate bolts are tight.

INSTALLING THE TRANS

You should have swapped the nose cone already, if you haven’t, do it now. Bolt it in, hook up the clutch cable, and if you want, hook up the starter too.

INSTALLING AXLES

The axles we supply are called floating axles, which means the splines on the axles are long and that allows the axle to lay flat within the CV joint. This design is much easier on the CVs because it does not bind up. Only the circlip is used with these axles, the original cup spacer on the old axles is not used. We recommend using new CV joints but if the cost prohibits you from doing so; always clean and inspect any used CVs. We also recommend using CV grease to repack them. After your axles are assembled, install them on the bus and torque them to 25 ft lbs.

BRAKES

The original brakes that came on the Bug trailing arms can be used. The first thing that needs to be done is the backing plates need to be taken off the trailing arms and traded with the opposite sides. They also need to be mounted up side down so that the hole for the emergency brake cable comes into the top pointing toward the front of the bus. The original wheel cylinder can also be used but we recommend using a 1968 or later Bug front wheel cylinder as it has the same piston size as your old bus one. When mounting your emergency brake cables, the 2” long,

gold tube must be put in between the backing plate and the cable housing. In addition, there is 2" of the spring around the cable that needs to be cut off; that will allow the gold extension tube to be installed. Make sure that when you put the brake drum on, you **torque the drum to 250 ft lbs** and then install the cotter pin. It is also a good idea to drive the bus for a day and then torque the nut again. There are several different brake drums that can be used depending on what wheel pattern you want to use. The Bug drums that came on the trailing arms can be used, however if you want the original 5 lug design that was on your bus you will have to use adapters in order to use the Bug drums. For the large, five lug design; you can use an early Squareback drum. If you are going to do this you will need the backing plate and hardware from any year Type III. The wheel cylinder does not need to be changed when using Type III. If your bus used the small axle, 36mm axle nut than your old drums can also be used with some machine work. You must machine off $\frac{3}{4}$ " off the snout of the drum where the axle nut seats and the outer most lip on the outside of the drum needs to be machined off so the drum will fit in the backing plate. If you have a custom wheel application that does not use a VW pattern or if we lost you on all of this, give us a call.

INSTALLING HYDRALIC BRAKE LINES

Find the metal brake lines (from the wheel cylinders that came off the arms), and thread these into your wheel cylinders. They should follow the arm snugly until they come to the metal tab on the arm that holds the flex line. Very carefully bend the line so that the nut lines up with the hole in the metal tab. If you kink the line throw it away and get another one. Hopefully you grabbed the metal line and brass union that went from fork to fork off the Type I or III suspension. Mount the 1 to 1 brass union loosely on the passenger side fork through the hole that the little brake line clamp was attached. Point one of the openings toward the arm. Now use a flex line off the front of a 65-66 Bug (#31106110701B) and go from this union to the tab that is on the arm. Just thread the male end into the union T that is on the fork. Arrange the hose so it points towards the metal line. The main metal brake line that comes from the front might need to be bent slightly so the hose points towards the arm. Carefully bend the metal line that goes from fork to fork so that it goes from union to union. Try to make sure the metal line is not in the way of the clutch and throttle cables, nor riding on the trans. Thread this metal line into the union. Now tighten the mounting bolts on the brass unions, and tighten the metal line as well as the two flex lines. Take the female ends of the flex lines and place them through the metal tabs on the arm. Thread the metal line that comes from the wheel cylinder into it. Install the clip that holds the flex line to the tab. Then with a 17mm and 11mm tighten the flex line to the metal line. Adjust your shoes and bleed the brakes.

ADJUSTING AND BLEEDING YOUR BRAKES

ADJUSTING YOUR BRAKE SHOES: To adjust your brake shoes, use a large blade screwdriver and spin the brake adjustment star until the drum locks up and the star no longer turns. This sets the brake shoe. Back off the adjustment star until you can spin the drum without any drag. Repeat the procedure on the remaining star. Go to the opposite drum and repeat the procedure on those two adjustments stars.

BLEEDING THE BRAKES: We found this to be the best way to bleed your brakes. Get an empty soft drink bottle and fill it a quarter of the way up with brake fluid. Using a three-foot piece of VW fuel hose (5mm), place one end of the hose in the bottle, submerging the end into the fluid and connect the other end to the bleeder valve. Have your friend “Al” get in and start to pump the brake pedal, about a dozen times. Now have “Al” hold the pedal down. Open the bleeder valve to release the pressure and the pedal will go to the floor. Pump the pedal slowly until you can no longer see air bubbles in the brake fluid in the bottle. ***Don't forget to add fluid to the reservoir while doing this-if not you will start pumping air through the lines!*** It is also important that the hose stays submerged in the fluid throughout this procedure. Hold the pedal to the floor and tighten the bleeder. When you are finished, repeat the procedure.

STOPS

A stop, which is not included in the kit, must be used. The stops you will make eliminate the chance of the CV joints over extending when your bus goes through a pothole or over a speed bump. Bolt or weld the stops to the casting so that when the plate comes down, it will hit the new stop. To determine the thickness of the stop, rotate your tire and see if the CV joint is binding. If it is, jack up the arm until you can spin the wheel freely. Now measure between the spring plate and the original stop and make a new stop that thickness. If the stop is thick enough, you can drill it and bolt it to the casting.

SHOCKS

The clearance for installing the shocks in the stock location is close, depending on how much you lowered your bus. You are going to want to use a small diameter shock because a large heavy duty one will not have enough clearance. In most cases it's best to relocate the top shock mount on the bus. Remove the mount by slicing the weld on the top and the bottom of the mount and then drill out the spot welds in the middle. A lot of the time the mount can just be left where it is. Some buses used an upper snubber stop; this might need to be removed. To determine where to put the new upper-shock mount bracket, start by installing the shock in the control arm and place the mount against the frame. Now compress the shock about a ½”, this way there is no way you are going to bottom out the shock. Weld the bracket into place. **NOTE: *The main wiring harness is in the frame on the passenger side. It needs to be moved or protected from the heat of the welding.***

CLUTCH

If the transaxle you got is out of a 1971 or later car, it will have a later style throw out (T/O) bearing, which requires a different style pressure plate than what was on your original engine. The difference is a thin metal sleeve that is bolted to the transmission casing that supports the T/O bearing. Compare this with your old transaxle, its T/O bearing is not supported and will rock back and forth. If your new transmission is the same as your old one then your old pressure plate will work. If the T/O bearing is supported with the sleeve (late style), you will need to get a late style pressure plate, which does not have a round collar in the middle. This is very important step and should not be overlooked.

TORQUES

❖ Pivot Bolt	87 ft lbs
❖ Spring Plate Bolts	80 ft lbs
❖ Adapter Bolts	80 ft lbs
❖ CV Bolts	25 ft lbs
❖ Shock Bolts	50 ft lbs
❖ Nose Cone Nuts	11 ft lbs