

Installing the Vanistan/Rocky Mountain Westy WBXaustSS Stainless Tuned Exhaust System

Components list:

- One cylinder 1 and 3 (forward) primary runner pair (top most in picture below)
- One cylinder 2 and 4 (rearward) primary runner pair (left center)
- One secondary runner pair (right center)
- One collector J-pipe (left bottom)
- One catalytic convertor (bottom left-center)
- One muffler (bottom right-center)
- One angled tailpipe (bottom rightmost; tailpipe may differ from pictured)



- One left side main support bracket
- One left side catalyst support shelf bracket (larger)
- One right-side main support bracket
- One right-side tailpipe support shelf bracket (smaller)
- One right side secondary pipe support saddle bracket
- One saddle bracket cover
- Four stainless butt joint band clamp (the band is flat)
- One 3" catalyst-to-muffler stub pipe

Fasteners and gaskets list:

- Four exhaust port gaskets
- Eight M8 11mm-hex nuts
- Four M8x45 13mm-head hex bolts
- Eight conical Belleville washers
- Four M8 12mm-hex copper-clad flanged deformable nuts
- Four M8x30 13mm-head hex bolts
- Six M8x20 13mm-head hex bolts
- Ten M8 13mm-hex flanged nuts
- Eighteen M8 flat washers
- Eight M8x38mm exhaust port studs

Assembly Notes:

All directions are from the driver's point of view i.e. forward is always toward the front of the car, left-hand is always to the driver's left.

The old exhaust pipes, muffler support saddle brackets, and the pipe runner brackets along the centerline of the engine sump must be removed before beginning installation of the WBXaustSS.

The sheet metal pushrod tube cover under the right cylinder bank can be made to fit, but the fit is very close and it is recommended that it be removed.

If your van has the sheet metal splash shields hung from the sides of the engine bay underneath the van, the right side one will need to have a notch cut out to accommodate the outboard bend of the #1 cylinder primary runner.

VW used a stud and a bolt on the exhaust port flanges of the wbx. It is suggested that you install the supplied studs in place of the bolts before installing the exhaust system, and replace the other old studs if practical. When installing studs, first coat the threads of the studs with anti seize paste. Use two hex nuts on the stud, tightened against each other, to grip the stud without damaging the threads, and run each stud into the head until $\frac{3}{4}$ " to 1" of the stud remains exposed, or the stud bottoms out (gently). Then slacken the two nuts away from each other and spin them off.

Using a little anti-seize paste on the threads of fasteners will ease disassembly in the future, especially those fasteners at the cylinder heads.

Optionally, a coating of exhaust sealing paste inside the female side of slip joints before the band clamps are put on, can aid in making a gas-tight seal at these junctures. A ceramic-based paste is preferable, such products can often be found at auto parts stores. We recommend avoiding use of any RTV silicone products anywhere in the exhaust system.

The exhaust clamps included with the current iteration of this kit are now straight band clamps. The photos shot a stepped style clamp that has been superceded. The straight clamp will deform and seal the pipes tightly as it is tightened.

As you install the exhaust components on the engine, initially attach fasteners just tight enough to hold each component in place, to allow some flexibility in positioning as you add components. Once everything is in place, fasteners and clamps can be final tightened, starting at the cylinder head ports and progressing along the exhaust tract. More on this in step 11.

This installation can be done solo, but some of the assembly steps will be much easier if you have a helper to hold a component in position while you put fasteners in place.

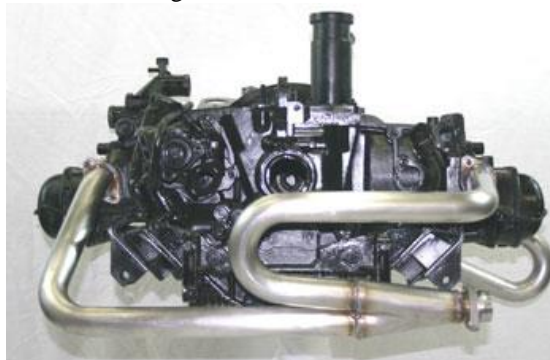
Tightness of all fasteners must be rechecked after the engine has been run a few times to full operating temperature and allowed to cool down. *The band clamps especially will require additional tightening to the full 65 ft.lb.!*

If installing with the engine on a stand, the muffler heatshield, cast aluminum engine carrier, rubber mount blocks and engine support crossbeam ("moustache bar") should first be installed as they normally would.

Installation:

1. First install the studs supplied at each engine exhaust port. Then place a gasket over the studs. If the supplied gaskets have a metal facing on one side, place the metal facing against the head.
2. Hang the primary runner pairs in place, and use the flat washers and M8 11mm-hex nuts provided on the exhaust port studs. The 11mm-hex nuts make it easier to get a wrench on as they are very close to the pipes. A 7/16" wrench is sometimes a better fit for these nuts, even though they are nominally metric.

Below left is the #1 and 3 runner pair in place on the front of the engine.



3. Above right is the #2 and 4 pair on the rear of the engine. This runner pair has to be installed before installing the leftside main support bracket.

4. Using two of the M8x30 hexbolts, flat washers and flanged nuts, bolt the leftside main support bracket to the aluminum engine carrier's leftside "ear". Then use four of the M8x20 hexbolts, flat washers, and flanged nuts to attach the leftside shelf bracket to the main bracket as shown below left.



5. Do the same with the right-side main support bracket and attach the tailpipe shelf bracket and secondary pipe support saddle bracket to it as shown above center and above right (secondary pipe is in place in these pictures).

You can tighten the fasteners holding the main brackets to the engine carrier's ears now, because access will be more difficult later, but do not fully tighten the shelf and saddle bracket bolts yet as you may need to adjust their positions as you go along.

6. Next you will attach the secondary runner pair to the two primary pairs. Slip the end of the pipe that will meet the forward primary runner pair thru the space above the moustache bar as shown below left, and swing the piece up into place so that the bell mouth ends meet each of the ends of the primary pairs.



You will use the M8 x 45mm hex bolts with two of the conical Belleville washers stacked under each bolt head, and the flanged copper nuts with no washers to pull the captive flanges together, as shown above right. Slip the joints together, thread up the bolts, cone washers, and nuts, and tighten the nuts until the joints are brought together snug, but don't final tighten the fasteners yet.

7. Remove both nuts from one of the slip joint band clamps, then place the band clamp over the short leg of the J-pipe, oriented so that the free ends of the clamp bolts will drop into the holes in the left side shelf bracket from above as shown in both pictures below (the bolts can be removed from a slip joint band clamp and reversed if needed to get the desired orientation). Start the nuts onto the bolts but leave everything loose as shown below left.



Another band clamp should be slipped in the opposite direction onto the 2" collector pipe end of the secondary. The clamp's bolts should be to the rear and the nuts downward so they will be easier to access. Next slide the J-pipe to the left enough that you can slip the longer leg of the J-pipe and the end of the secondary pair together.

The J-pipe will run toward the left to cross just under the muffler heat shield. Adjust the height of the left shelf bracket as needed to make sure there is good clearance, at least 1/2" all the way across above the J-pipe.

8. The catalyst and muffler should be joined together as an assembly now. The catalyst's oxygen sensor bung is on the upstream inlet side of the catalyst, which will be the left end when installed, and on the upper half of the pipe, so that the sensor will be installed from above (this is important for sensor life; see picture above right). Also note that the muffler has an arrow indicating the direction of exhaust gas flow, so be sure the upstream end of the muffler is the end joined to the catalyst. In their final positions the seam line of the catalyst should be on a roughly horizontal plane, and the seam line of the muffler on a roughly vertical plane.

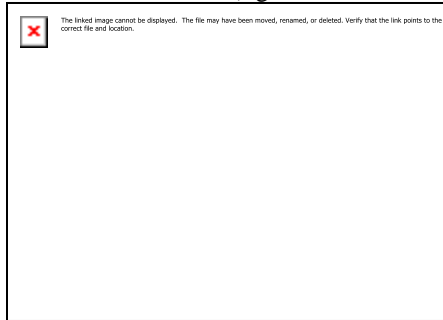
Slip the 3" stub pipe into the outlet pipe of the catalyst, and slip the loosened flat butt joint band clamp over the outlet. The band clamp will be easiest to tighten later if its bolts are rearward, nuts downward.

The sleeve clamps are 3" wide, so you can make a mark with a felt-tip pen 1.5" from the end of either pipe, so that when you position the sleeve clamp over the butted joint you can bring its edge to your mark and the clamp will thereby be centered over the joint, so that when tightened this will become an effectively rigid assembly.

Slip the inlet pipe of the muffler into the joint made by the stub pipe and band clamp. Check the orientation of the catalyst, clamp, and muffler to each other, and tighten both sleeve clamp bolts until they hold the joint together firmly but don't final tighten the bolts yet.

9. Once the catalyst and muffler are joined, remove the nuts from the other slip joint band clamp and slip the clamp over the tailpipe outlet end of the muffler, with the bolts oriented the same way as the catalyst inlet's band clamp.

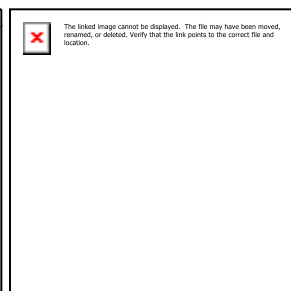
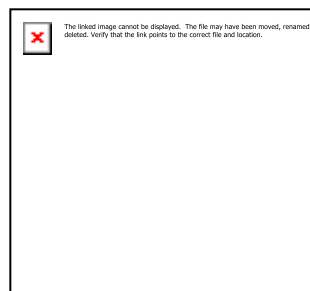
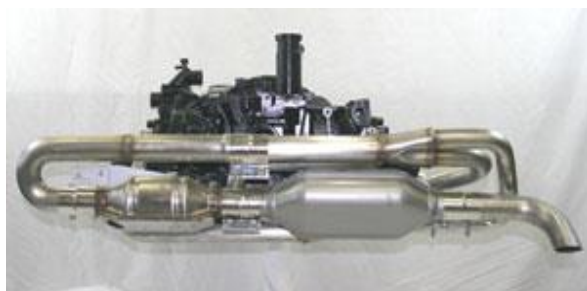
10. Now lift the catalyst/muffler assembly up and slip the inlet pipe of the catalyst over the end of the J-pipe, while hanging the other band clamp bolts in the bolt holes of the right-side support shelf bracket. Start the nuts on the bolt ends to hold it there (right-side shelf, saddle bracket and band clamp shown below left).



Slip the angled tailpipe section into the outlet end of the muffler's slip joint band clamp and tighten up the clamps' bolts enough to hold the joint from slipping apart. The angled end of the tailpipe should slope slightly downward and to the rear.

Settle the cat/muffler assembly so that the J-pipe goes into the cat's inlet pipe at least 1 1/2", or until it stops against the weld inside the inlet pipe. The longer leg of the J-pipe should likewise slip over the end of the secondary pipe by at least 1 1/2".

Run the nuts onto the band clamp bolts at both shelf brackets so the cat/muffler assembly doesn't sag. Loosen and adjust the positions of the shelf brackets if necessary, and the attitude of the cat/muffler assembly can be adjusted to be horizontal at this time. Adjust the position of the saddle bracket so it is in contact with the top of the lower secondary runner, and attach the saddle bracket cover with the four bolts and nuts provided (see pictures below center and right).



11. Now the whole collector-to-tailpipe assembly should be hanging in place like in the picture above-left, and you can begin tightening things up. First tighten the 11mm hex-nuts on all four exhaust port flanges to about 18-20 ft.lbs. Then tighten the secondary pipe-to-primary joints, being careful to alternate between the two bolts at each joint to draw the joint together evenly.

After that, you should check the position of the catalyst and muffler and rotate them if necessary so they don't touch or interfere with any other parts. Always be sure the catalyst's oxygen sensor bung is not at any downward-pointing angle, and that there is sufficient room around it to accommodate the sensor. See the picture on page 3.

Tighten the four band clamps. These clamps must be brought to a torque of 45-60 ft.lb. Very tight! You will need to hold a 9/16" (or 14mm) counter-wrench on the bolts as you tighten up the nuts with a deep socket and long flex bar. Alternate between the two bolts on each clamp and bring them up to the final torque in stages. Check the position of the components as you tighten to be sure they don't move from your favored positions. All the band clamps will have to be tightened again to the full 65 ft.lbs. After the engine has been run to full operating temperature and allowed to cool down several times, as the bands will stretch a bit and the joints will settle during thermal cycling.

Once the band clamps are all tight, check that all the bolts holding the shelf brackets to the main brackets are also tight.

12. Your van's oxygen sensor should be threaded into the bung that is part of the catalyst. Use a little aluminum anti-seize paste on the threads, but be very careful not to get any on the sensor tip. It should not be torqued to more than about 35ft.lb.

Route the wiring for the sensor to the O2 signal input cable and sensor heater connector (if so equipped), being careful to keep it away from the exhaust piping. Use wire-ties if needed to secure the wire away from hot components. Also check that no other wires or hoses are close to any exhaust pipe or component; if necessary, reroute and/or tie them off to be safely away from hot components.

The installation is now complete and ready for road-testing.

After a few heat-up and cool-down cycles of normal driving, it is important to recheck the torque of all the fasteners and clamps of your exhaust system, especially the band clamps.

Enjoy your new tuned exhaust system! We welcome your questions, comments and suggestions, at mike@rmwesty.com, or at info@vanistan.com.

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Thanks!

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