Honda V4 Oil Supply Line Upgrade Installation Instructions

Background:

The Honda V4 series of engines have long been a favorite of motorcyclists. These engines are not, unfortunately, known for being trouble-free. One major design flaw, the subject of this modification, is the system used to lubricate the valve train area. Although the stock system is very insufficient, there is a way to improve on the design and give the valve train the lubrication is requires.

The basic problem is that the oil supply to the valve train originates from the gearbox area. This supply is non-filtered and low pressure (read also low volume). The cams and rockers require a supply of oil that is much greater that this. This oil should also be filtered in order to not score the aluminum bearing surfaces of the cam retainers.

This modification takes a tap from the main oil gallery and routes it to the top end of the engine. This oil supply is filtered and is of a pressure/volume that is adequate to lubricate the valve train area. The following steps will help guide you through the modification process.

Parts Included:

Qty	Description
4	-4 AN Straight Hose End
1	-4 AN Union Tee
1	-4 AN to 1/8" NPT Adaptor
2	-4 AN 90° Hose End
5'	-4 AN Braided Steel Hose
2	-4 AN to 10mm Banjo Fitting
1	10mm Hex Head Bolt

Note: VF500F kits also include (1) Banjo Spacer (1) double banjo bolt and (3) sealing washers.

Modification Steps:

Pictures of this procedure can be found under VF1000F Project -> Cam Oil Supply Modification on the website below:

http://www.daughertymotorsports.com

1. You should begin by draining the oil from the engine. The coolant will not need to be drained for this modification.

2. Remove the right side crankcase cover. This is the large one that covers the clutch side of the engine.
3. Directly below the output gear (the small one attached to the crankshaft) you should see a small silver plug with a point in the center. Remove this plug and clean any debris behind it.
4. You should now be able to see down the length of the main oil gallery that runs below the crankshaft journals. Next you will need to locate where this passage is from the outside of the engine. There should be a raised area visible between the case cover flange and the oil pan. On some models there will be a cast-in "boss" that will locate where you need to drill. For all others, you will simply drill directly into the center of the raised area.
5. Before drilling you should stuff a few cotton balls or paper towels into the main oil gallery. Be sure to press them in far enough so that they are inward of where you will be drilling yet not so far as to make them difficult to remove.
6. You are now ready to drill the block to accept the new oil line. Begin by drilling a small pilot hole of Ø1/8" or less. Afterwards you will come back and enlarge the hole to Q-size (Ø.332in). It should go without saying that this is a delicate step, so go slowly and be careful to drill the holes straight.
7. Once the hole has been drilled, thread it with a standard 1/8"-27 NPT pipe thread tap. You will want to proceed until the tap touches the top of the main oil gallery. You might want to stop halfway through and trial fit the adaptor to gage how far you need to tap.
8. Clean all aluminum chips thoroughly. Remove the cotton balls or paper towels from the main oil gallery. Make sure to clean everything including the floor.
9. Replace the gallery plug and the crankcase cover.
10. You might find it advantageous to remove the carbs to assemble the new lines.
11. Remove the existing oil lines to the heads. You will usually destroy them unless the carbs are also removed.
12. Block off the old supply port using the included 10mm bolt. You should reuse one of the old copper washers if it is not damaged.
13. Next you will need to assemble the hoses that will make up the new supply lines. There are separate instructions below on how to do this.
14. When assembling the hoses to the engine, make sure that they are not touching the exhaust pipes or chafing against any sharp edges of the block. Also be sure to clean the recessed areas around the banjo bolts in the heads to insure proper sealing.
15. Replace any parts that were removed. Refill the engine with oil and start to check for leaks. Make sure to get the oil hot, as this will identify the leaks better.

Hose Assembly:

Before beginning the assembly of the hoses and fittings, it is important to layout where the lines are going to fit around the engine. Sometimes a clothes hanger or brazing rod works well to make a template. The kit includes a small amount of extra hose to compensate for different routings. There is not a great deal of extra, though, so be perfectly sure before cutting any of it.

The steps below give you a general idea of how to route the lines. If you choose to route them another way, make sure to check that you have enough hose first.

1. Attach the 1/8 NPT adapter to the main oil gallery. Loosely thread on a 90° end fitting (used for the next step).
2. Position the tee such that the two ends which are inline run from left to right and the perpendicular end points forward. You should position the perpendicular end so that it is pointing directly as the front head feed port. You might find it helpful to lightly attach the three straight hose ends to the tee at this point.
3. Measure the length of the primary supply line. This is the line that will run from the main oil gallery to the tee under the carbs. Assemble the 90° and straight hose ends to this line.
4. Layout and cut the hose for the lines that go from the tee to each head. Make sure to take into account the length of the fittings. Each line should have a straight fitting at the tee. This front head will have a banjo with a straight fitting and the read head will have a banjo with a 90° fitting. (Note: on VF500F models the front head requires the use of the double banjo bolt and spacer. Route the line in front of the carburetor from the outside.)
5. Attach each secondary hose to the tee and the cylinder head.
6. Make sure that none of the lines will interfere with the throttle movement.

Conclusion:

You might have noticed that I have left some details to the installer. This is because everyone seems to have their own idea of how they want it to look. It was an objective to make this kit one that is very general and can be applied to all models and personal tastes. If you require any additional assistance, please feel free to e-mail or call me.

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