

Oil Lines on LJ10 and LJ20 Engines

Finding / Repairing Leaks

“Old Codger New To Old Suzuki Jeeps”

Important: This information pertains only to the four oil lines located between the oil pump and the engine.

I. Overview – Locating leaks by using oil applied to the outside of the oil line: It appears that sometimes these oil lines can have leaks so small that oil inside the line will not leak out enough to be visible. However, because air is a mixture of gases, the vacuum pulled on the line when the engine is running can draw air through the leak and into the line creating bubbles in the oil. This procedure makes use of the same principle to locate the tiny leaks. First, mentally divide the line into several short sections. Oil is applied to the outside of one section while the vehicle is parked and with the engine running. If this happens to be where the leak is located, the oil should be held in place by engine vacuum, temporarily plugging the leak and preventing air from entering. After the leak has been plugged for several minutes, you should then notice that the bubbles inside the line have stopped forming. By testing one short section at a time and waiting several minutes between sections, you should be able to locate the leak. Notice: The way these oil lines are configured, you must start at the bottom of the line and work your way up until you find the leak. If you try working from the top down, the oil you apply to the outside of the line will run down on sections that have yet to be tested.

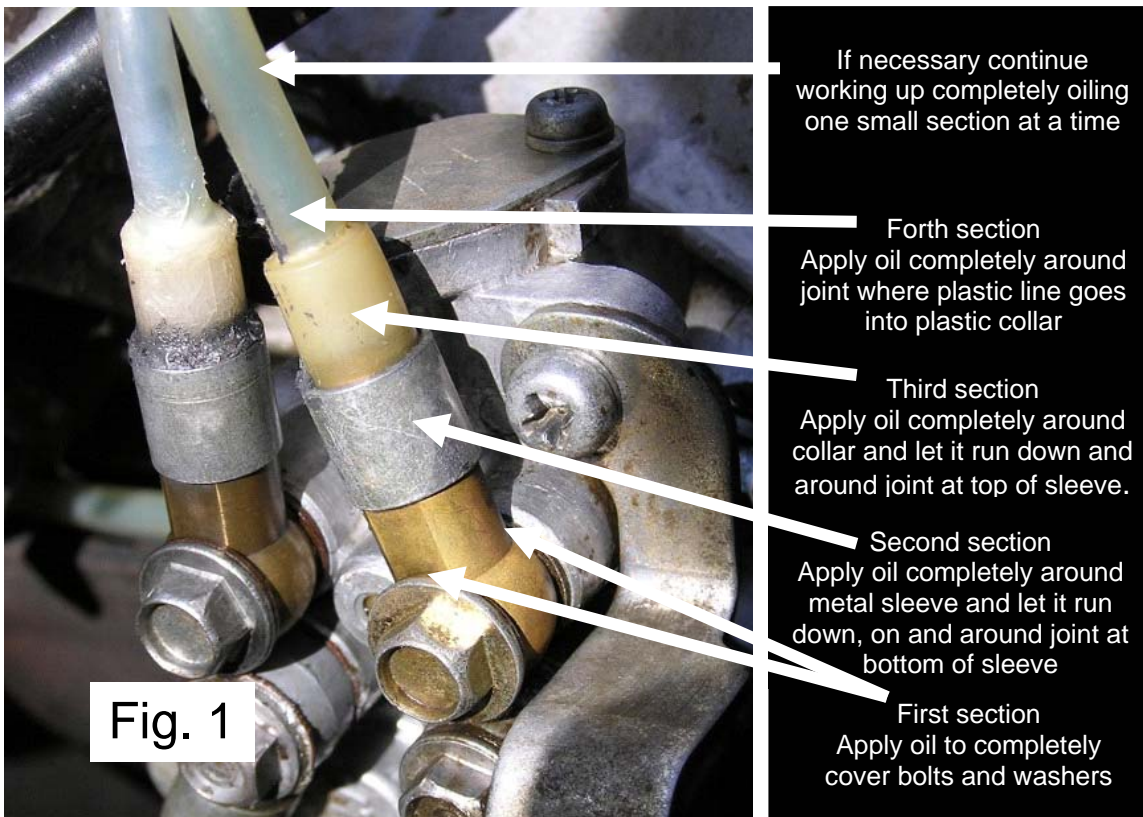
Important: (1) You must ensure that the oil completely covers the section being tested. (2) It is very important to wait and watch for several minutes prior to moving to the next section. This allows you to observe if the bubbles have stopped. (3) Anytime there are bubbles inside the line, that line is not delivering the proper amount of oil. It is very important to ensure adequate oil is being delivered at all times. One way to do this is to premix gas and oil in the gas tank at a ratio of 30:1 until the leak is found and corrected.

II. Equipment/tools/ etc.:

- A. Oil with a high viscosity. I used some of the gear oil I put in the front/rear axle gears.
- B. Oil can or other means that will allow the oil to be applied to a precise location including the back side of the line.
- C. Patience to wait and watch several minutes before moving to next section of line.


III. Procedure steps – To be used in conjunction with Fig. 1 on next page:

- A. Start the engine, bring it up to normal operating temperature, and then adjust carburetor to fast idle.
- B. Keep the engine running during the entire test.
- C. Start at the bottom section of the line first (see Fig. 1)
- D. Apply oil completely around the circumference of the outside of this section.
- E. Let the oil run down the line until it coats this small section completely.
- F. Wait several minutes while watching the air bubbles move through the line.
 1. If the air bubbles stop forming, the leak is in the section you just oiled.
 2. If the air bubbles continue to form, move up to the next section (Fig 1) and repeat Steps D, E and F.
- G. Remember: Wait for several minutes after applying oil to a section. If the bubbles stop forming, the leak will be in the last section that oil was applied to.



Background Information: My LJ20 had a chronic, intermittent problem with air getting into one oil line. After replacing the washers on the pump end banjo fitting, the leak would stop for several days, sometimes several weeks, and then the bubbles would suddenly appear again, usually after driving the LJ for several miles. Using the procedure above, I discovered that the leak was actually a pin hole located just a little above the washers in the joint where the plastic line joins the plastic collar (fourth section in Fig. 1).

Some questions that were addressed

- Q 1. How can air get into the lines?
- A. If there is a leak in a line, air will be pulled into the line when that line is under engine vacuum.
- Q 2. Why doesn't the oil leak out when the engine is not running?
- A. It seems that it is not uncommon for air to leak in without oil leaking out. This may be due to oil being a liquid many times more viscous (thicker) than air which is a mixture of gases and vapors. (bigger molecules have a harder time getting through tiny holes)
- Q 3. How could bubbles appear in the line suddenly, days or even weeks after the washers were replaced and without anything being disturbed? Why didn't it stay fixed?
- A. My guess is that each time I replaced the washers, residual oil from the system and/or oil from my hands would plug up the leak located above the washers and keep it plugged until that oil evaporated, ran on down the line, or was finally pulled into the engine.
- Q4. How will I know if there is a leak on the steel portion (upper end) of the line where air bubbles cannot be seen?
- A.
-  I am afraid it will be by rapidly decreasing RPM and loud noises.

IV. Repairing oil line leaks: If a oil line is leaking, installing another line that does not leak would seem to be the best fix. However, if a replacement line is not available, making repairs may be your only option. For this you may need to get creative.

On my LJ20, the leak was on the lower end where the plastic line joins into the plastic collar. The steps listed below were used to seal this leak. (With the creative minds we have out there, I am sure there are additional repair methods)

Caution: Using pressure to purge or clean the inside of the line may damage the small spring loaded check valve located just inside the lower banjo fitting.

- A. Removed line and positioned it hanging bottom end up for several hours to drain the oil out. (it did not completely drain)
- B. Cleaned the outside of the area to be repaired with Berryman's B-12 Chemtool (spray can).
 1. Cleaned completely around the joint that had the leak, including spraying directly on the pin hole leak. (the repair will be made completely around the line in this area)
- C. Lightly sanded area with fine grain sand paper.
- D. Repeated step "B".above
- E. Masked off area with masking tape.
- F. Applied black RTV silicone completely around the joint.
- G. Removed masking tape after silicone was cured.

After the repair, this line was used for several months and was still performing well when I finally replaced the line with one acquired from a very good friend.

Hope this helps. If you have questions or want to suggest corrections or upgrades, please advise.

Myers "Old Codger New To Old Suzuki Jeeps"