General Guidelines for Installing Hydraulic Components

ZF Off-Highway Solutions Minnesota Inc. hydraulic components are precision built devices and must be treated as such. The following guidelines must be followed at the time of installation to ensure optimum performance.

Where to Mount

To properly locate the component or fluid line, you must. . .

1. Make it convenient for operator.
2. Use the shortest and most protected line route. Protect components from damaging environments such as road salts and general debris.
3. Avoid exposing components and lines in wheel compartments.
4. Avoid mounting near engine, exhaust lines, muffler or anywhere heat may be generated. **NOTE: Excessive heat transferred to system fluid may result in damage to lines or seals.**
5. Mount components that have to be bled lower than brake valve/master cylinder and with bleeder screws on top to facilitate bleeding.

Cleanliness

It is impossible to overemphasize the importance of cleanliness during installation. All lines, fittings and adjacent areas must be cleaned of dirt or road residue before any lines or fittings are disconnected. Special care must be taken so dirt and road residue are not allowed to enter the hydraulic system. This can contaminate the system and interfere with the proper operation. Always. . .

1. Use clean, high quality fluid of the type indicated by Machine Manufacturer. Improper or contaminated fluid may cause gummy deposits and softening and swelling of seals in the entire system. Such a condition must be corrected immediately.
2. Be sure fittings and seats are clean before making connections. Do not use sealants, tapes, teflon or cement compounds on any connections or fittings. These sealants or compounds can contaminate the hydraulic system and interfere with the operation of system components.
3. Before adding fluid to the system, thoroughly clean the surrounding area where fluid is added. When adding fluid, be sure the entire process is done in a contamination free method.

How to Mount

To properly mount components and fluid lines to withstand the most severe vibration conditions, always. . .

1. Follow the procedures outlined in Machine Manufacturer Service Manual and/or SAE Standards when making new hose and tubing connections or adding to existing system.
2. Use the proper size and grade fasteners and secure using measures to prevent them from becoming loose.
3. Prevent fluid line fractures and loosening or leaking fittings by using the proper size tube clamps to secure lines.
4. (For steel brake line tubing) Use high quality, factory flared lengths. Hand made flares, when used, must be double flared. Any flash or loose particles must be removed.
5. Use flexible fluid line between frame and body.
6. Use grommets or some other means to protect fluid lines that pass through the frame or firewall.
7. Make sure fittings and connections are in good condition and tightened to proper torque values.

Importance of Bleeding (Brake Systems)

The hydraulic brake system must be bled whenever any line has been disconnected. Air trapped in the system can cause spongy and inadequate brakes. There are two methods of bleeding hydraulic systems, pressure bleeding and manual bleeding. Both methods are acceptable and adequate but pressure bleeding is recommended if the equipment is available. Follow bleeding instructions as specified by the Machine Manufacturer.

To properly bleed the system. . .

1. Be certain all fittings are tight to avoid leaking.
2. Depress pedal and open up bleeder screws to allow air to escape. Air will always seek the highest level.
3. Re-tighten bleeder screws and allow pedal to return.
4. Repeat cycle until pedal is firm.
5. Make several static brake applications and then repeat cycle once more.

Leak in the System

Even the smallest leak in a brake system will adversely affect the system. A leak may eventually deplete the reserve supply and reduce braking pressure. To help prevent leaking. . .

1. Check connections during bleeding and static brake processes to be sure they are tight.
2. Always reinstall new hoses, lines and fittings if they look the least bit questionable.
3. All system components and all fittings must be routinely inspected for leaks, damage or wear. Adequate fluid levels must be maintained. In the event of any loss of fluid, the brake system must be carefully inspected for leaks and corrected.

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Form No. 81-600-001 Revised 2011-08-03