



Lever Lock

Installation and Service Instructions

NOTE

The hex flats on the lock sections may not be exactly aligned with one another, and the bleeder screw ports may not be positioned perfectly upright. DO NOT attempt to adjust or tamper with the hex flats of these sections or damage to the brake lock may occur.

BRAKE FLUID MODEL NUMBERS

02-640-123
02-640-125
03-640-131

MINERAL BASED HYDRAULIC OIL MODEL NUMBERS

02-640-124
02-640-126
03-640-134

READ GENERAL INSTALLATION GUIDELINES SHEET (81-600-001) BEFORE PROCEEDING

⚠ WARNING

1. All ZF brake locking devices are **supplemental** safety equipment which provide additional brake holding action **when used with existing vehicle parking brake**.
2. The Low Pressure Warning Switch must be used in combination with an audible and/or visual alarm to signal any loss of system pressure. The Low Pressure Warning Switch is explained in the Operating Instructions (Form No. 81-640-033). **Do not disconnect Low Pressure Warning Switch.**
3. 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 hydraulic brake system. This can contaminate the system and interfere with proper operation of brakes and locking devices.
4. Follow procedures outlined in Vehicle Manufacturer Service Manual or SAE Standards when making new connections or adding to existing brake systems. Use only steel brake tubing conforming to SAE specifications.
5. For brake fluid models, use only brake fluid conforming to latest SAE or DOT Standards. Improper or contaminated brake fluid may cause gummy deposits and softening and swelling of other rubber seals in the entire brake system. Such a condition must be corrected immediately.
6. Do not use sealants, tapes, teflon, or cement compounds on any connections or fittings. These sealants or compounds can contaminate the hydraulic brake system and interfere with the operation of brake components or brake locking device.
7. All fittings and connections must be in good condition and tightened to proper torque values as specified in the Installation and Service Instructions.
8. Separate models of brake locking devices are available for brake fluid and for mineral based hydraulic oil. Select a model that conforms with the type of fluid in the brake system.
9. Brake hoses, brake lines, brake locking device, brake components, cylinders, 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.
10. After installation, bleed the system according to vehicle manufacture recommendations.
11. Follow INSPECTIONS and TESTS section as outlined in the Operating Instructions.
12. The self-adhesive warning label accompanying each brake locking device must be affixed in the vehicle cab in view of the operator.
13. The Operating Instructions must be placed in the cab of vehicle in a place available to operator.

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MOUNTING LEVER LOCK

Locate the lever lock for operator's convenience and allow for complete movement of lever.

The lever lock can be mounted under the dash lip for which a special mounting bracket is provided.

Tubing is not supplied because of the variation in each installation. Install tubing using the shortest and most protected route. Use same size tubing when replacing a line, unless otherwise specified.

Thoroughly inspect port threads for any foreign material after removing vinyl plugs.

Bleeder screws provided must be used on installation. The lever lock will usually be the highest component in the system and may contain air. This air, if not removed, will cause an ineffective and perhaps inoperative brake system.

- Using mounting bracket provided, mark lower dash lip with center punch and drill two 17/64 inch diameter holes. Mount bracket using bolts, nuts and lock washers provided (Figure 1).
- Select proper size fittings to match vehicle brake line. Install tube nut in fitting(s) and install in the lower ports of the lock body. **NOTE: bleeder screws occupy the upper most ports. These ports may not be exactly positioned as shown in illustrations. See NOTE on cover page.** Tighten fittings as indicated in the torque specifications. Remove spare tube nuts.
- Remove clevis assembly from body, leaving nut and lock washer on threads.
- Before installing unit on bracket, be sure the jam nut is screwed back as close to body as possible and the lock washer is outboard of the nut.
- Insert body in previously installed bracket from back. Install dash plate. Install clevis assembly. **Tighten clevis assembly until it bottoms out on body.**
- Before tightening jam nut, be sure dash plate is straight and the word TOP, stamped on clevis, is at the top and the lever is down. Position bleeder screws as close to upright as possible and torque the large hex flats 16.3-20.3 N·m (12-15 lb·ft) see Figure 1. Torque jam nut with a 15/16 inch open end wrench 20.3-33.9 N·m (15-25 lb·ft).

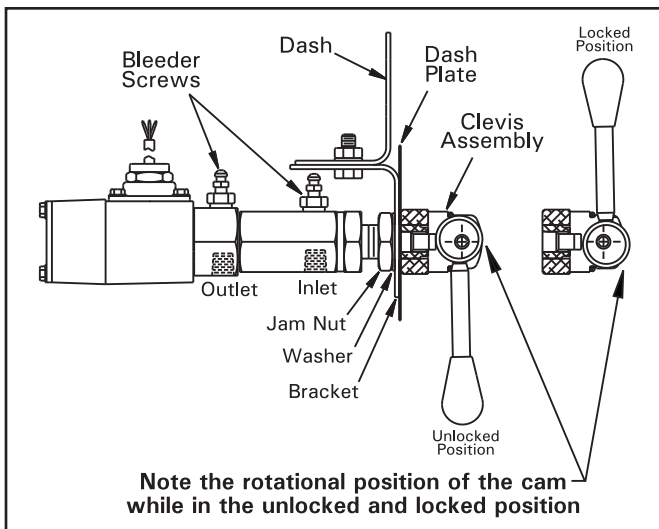


FIGURE 1

TORQUE SPECIFICATIONS

All hydraulic line connections must be torqued to specifications listed below and be free of leakage.

Thread Size	Torque
3/8-24	10.8-20.3 N·m (8-15 lb·ft)
7/16-24	16.3-23.0 N·m (12-17 lb·ft)
1/2-20	16.3-23.0 N·m (12-17 lb·ft)
9/16-18	20.3-33.9 N·m (15-25 lb·ft)

CONNECTING BRAKE LINES

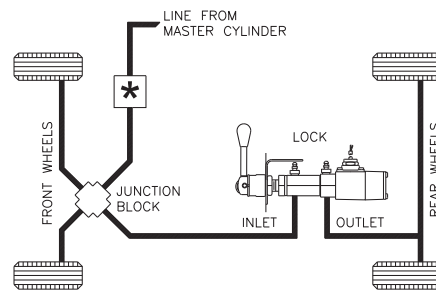
NOTE

The lever lock can only be used to lock one wheel in a 4-Channel Anti-Lock System and should not be used.

WARNING

For all brake systems in use today, including anti-lock, the lever lock must be installed between last hydraulic component in supply line and wheels.

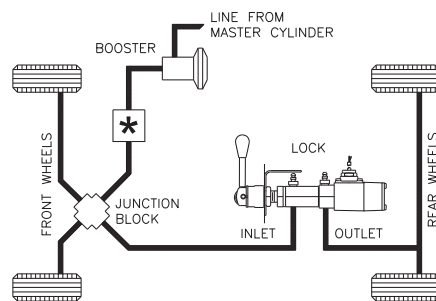
Single System



* If four-wheel lockup is desired, install lock in the line between master cylinder and junction block.

FIREWALL MOUNTED BOOSTER

FIGURE 2



* If four-wheel lockup is desired, install lock in the line between master cylinder and junction block.

REMOTE MOUNTED BOOSTER

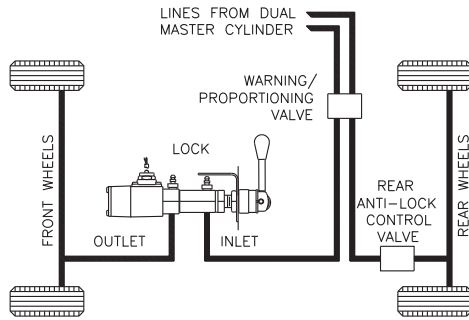
FIGURE 3

- Disconnect line from rear wheels at junction block.
- Install new line from the opened port of junction block to the INLET port of Lever lock. Install bleeder screws in upper ports of lever lock.
- Install new line in OUTLET port of lever lock and connect to line from rear wheels using tube union.

Dual System

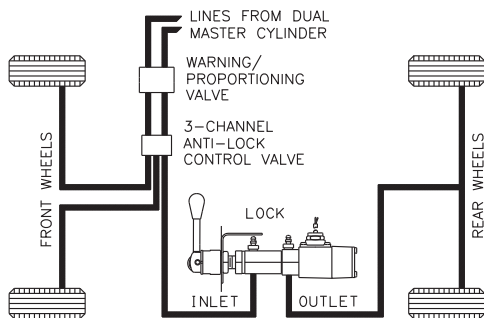
If vehicle has front disc/rear drum brakes, it may not be possible to lock adequate pressure in the rear wheels. For these vehicles we recommend installing lever lock in front portion of system or preferably installing a Dual Cable Lock or 691 Dual Brake Lock System.

Warning/Proportioning Valve may not be used in some dual systems.



FIREWALL MOUNTED BOOSTER
FIGURE 4

3-Channel Anti-Lock System (ABS)



REMOTE MOUNTED BOOSTER
FIGURE 5

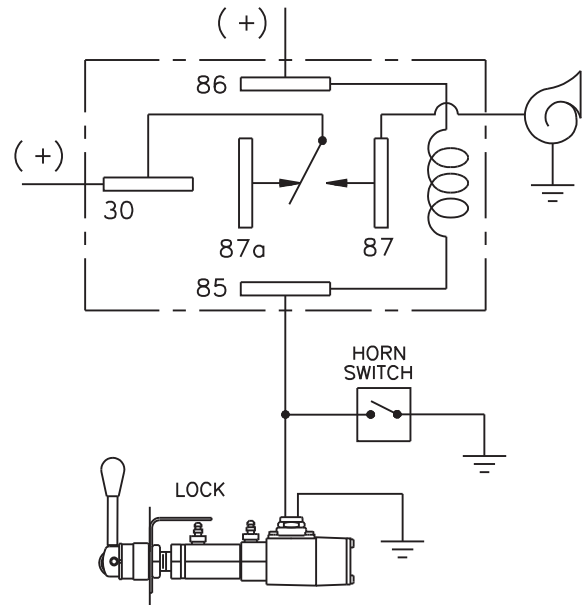
1. Disconnect line from wheels at the warning/proportioning valve (anti-lock control valve on ABS systems).
NOTE: If there is a tube union in the line to wheels you may prefer to disconnect there.
2. Install new line from the opened port to the INLET port of lever lock. Install bleeder screws in upper ports of leverlock.
3. Install new line in OUTLET port of Lever Lock and connect to line from wheels using a tube union.

CONNECTING HORN RELAY AND LOW PRESSURE WARNING SWITCH

(Refer to Figure 6)

⚠ CAUTION

If the vehicle does not have an auxiliary horn relay, or it is inaccessible, one will need to be installed. The auxiliary horn relay must be used when the electrical load exceeds 3 amps. Do not make connections from warning circuit directly to battery terminal, the pressure switch contacts will be damaged.



Typical Horn Relay
FIGURE 6

INSTALLATION OF CLEVIS ASSEMBLY AND PUSH ROD KIT

(Refer to Figure 7)

NOTE

It is not necessary to remove entire unit from dash when using repair parts from kits 02-600-001 and 02-600-002.

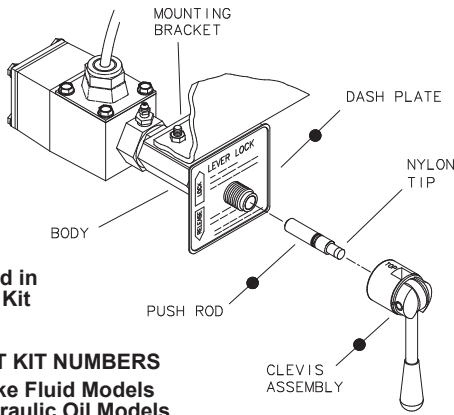
Disassembly Procedure

1. Remove clevis assembly from unit by loosening jam nut with 15/16 inch wrench. Jam nut is located behind mounting bracket see Figure 1.
2. Remove push rod assembly from body see Figure 7.

Assembly Procedure

1. Clean all parts thoroughly before assembling.
2. Lubricate new push rod assembly with clean type fluid used in system and install in body with nylon tip protruding.
3. Before installing clevis assembly, be sure that jam nut is screwed back to body as far as possible and that the lock washer is outboard of nut see Figure 1.
4. Install dash plate over protruding threads.
5. Screw on clevis assembly until it bottoms out on body.
6. Before tightening jam nut, be sure dash plate is straight and the word TOP, stamped on the clevis, is at the top and the lever is down. Position bleeder screws as close to upright as possible and torque the large hex flats 16.3-20.3 N·m (12-15 lb·ft). Torque jam nut with a 15/16 inch open end wrench 20.3-33.9 N·m (15-25 lb·ft).
7. Bleed system of air (see BLEEDING section on page 4). Tighten fittings if leaks occur (see TORQUE SPECIFICATIONS on page 2). Make several applications to be sure that lock is functioning properly.

FIGURE 7



- Items included in Replacement Kit

REPLACEMENT KIT NUMBERS
 02-600-001 Brake Fluid Models
 02-600-002 Hydraulic Oil Models

BLEEDING

See General Guidelines Sheet (Form No. 81-600-001) for bleeding instructions.

The hydraulic brake system must be bled whenever any line has been disconnected. 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 procedure and instructions as specified by vehicle manufacturer.

⚠ CAUTION

Use only Brake Fluid SAE J1703 or DOT 3 or 4 Brake Fluid or brake fluid specified by vehicle manufacturer. Never reuse brake fluid that has been drained from the system.

⚠ CAUTION

Before moving vehicle, a firm pedal must be achieved when lever lock is in full release position. If a firm pedal is not achieved, repeat bleeding procedure for lever lock and brake system until a firm pedal is achieved. Make several brake applications with vehicle stationary and check fittings for leaks.

TROUBLE SHOOTING GUIDE

Clevis assembly and push rod are supplied in Replacement Kit listed above (see Figure 7). Lock body and internal components are not available for field service. If lever lock is damaged by contaminants or impaired in any way return to ZF Off-Highway Solutions Minnesota Inc. for reconditioning or replacement and service other components accordingly.

PROBLEM	POSSIBLE CAUSE	RECOMMENDED SERVICE
System locked up and brakes will not release	Master cylinder or booster malfunction	Bleed at booster. If brakes release, problem is booster. Replace booster.
	Lock installed incorrectly between master cylinder and booster	Replumb lock so it is installed between vehicle brake and last hydraulic component in supply line.
	Clevis assembly not bottomed out on body resulting in excessive push rod to cam clearance	Screw on clevis assembly until it bottoms out on body.
	Wear tip worn excessively or broken off	Replace lock push rod, following instructions on page 4. Rebleed brake system.
	Clevis assembly worn excessively	Replace clevis assembly, following instructions on page 4. Rebleed brake system.
Brake system will not hold pressure	Leaking conditions in tubing and/or fittings	Check all tubing and fittings in brake system. Tighten or replace where required.
	Leak in wheel cylinder or caliper	Check for moist condition. If moist conditions exists replace or rebuild.
	Leak in lock valve	Replace Lock.
Low Pressure Warning Switch operates inadvertently or will not shut off	Locked up pressure leaking off	See problems and conditions under heading "Brake system will not hold pressure."
	Wiring improperly installed or short in wires	Check installation to conform with installation diagram. Check for shorted wiring.
Spongy or soft brake pedal	Air in system, improper bleeding at time of installation	Follow good bleeding practices. Use pressure bleeder when available.
	Slow leak in system	Check fittings and wheel cylinder for leaks. Tighten or replace fittings. Replace worn or damaged wheel cylinder.