



## Seal By-Pass Pressure Compensated Lubricating System

### Compy Model: HPL-1 Instructions

**Installation** Standard kit includes materials needed to convert one side of a typical boat or utility trailer axle spindle(s) up to three axle spindles per side can be manifolded together. Most trailers require two kits. Some locally purchased materials (not included in the kit) are required to perform the installation. Local items: # New seal rings & seals, 90w lube oil, standard spindle hub dust caps, epoxy cement (JB-Weld), silicon gasket sealer. (Bearings if needed)

**Important:** This product is intended for professional installation only, for improved bearing lubrication. This system will not correct any pre-existing damage, defects, wear or overload conditions.

Please read and follow all manufactures safety instructions for power or hand tools used during the install procedure. Wear safety glasses and gloves for all steps.

Always use proper jack stands to support trailer/vehicle weight.

#### Step-1

Perform normal procedure to remove trailer wheel & hub assembly. **(If you are not familiar with this process do not proceed! Please have a professional trailer or axle service shop install the kit).**

Remove seal and bearings from hub. Clean and inspect bearings & hub. All grease must be removed.

#### Step-2

Oil filler hole must be drilled and taped in each wheel hub. 1/8" MPT do this now before reinstalling bearings and seals in hubs. Location of the hole is between inboard and outboard bearing races. Test fit hub to trailer wheel before drilling to ensure supplied pipe plug doesn't interfere with normal wheel installation. After drilling & taping, thoroughly clean the hubs interior with solvent to remove all metal chips. Install supplied 1/8"mpt socket head plug hand tight. Replace bearing races if needed. Inboard bearing, oiled with 90w gear oil "no grease" can now be installed with new seal. Set completed hubs aside.

#### Step-3

Spindle Prep: Thoroughly clean spindles and inspect for damage. Most trailers axel spindles utilize a slip on stainless steel seal ring. The seal ring is a key component to this system. Existing seal ring must be removed for spindle modification. They will be reinstalled later. Use care if planning to reuse. \*Using new seal rings usually works best.

If your axle doesn't use a seal ring they must be added. Carefully measure diameter of axle seal contact area and depth. \*Proper fitting seal ring are usually obtainable at trailer or auto parts suppliers.

\* Local purchase "not supplied in kit".

**Do not proceed to spindle modifications without correct fitting seal rings available!**



Removing the seal ring

**Step-4**

Spindle Modification - Prep for oil tube barb fitting: Drill a 3/16" hole 1/2" deep, centered 1/4" from back edge of seal ring ends. (On drum brakes you may need to be off center to clear brake cylinder).



**Step-5**

Spindle Modification – Cutting Oil Galley: Use a Dremel or die grinder with 1.25" fiber cutting wheel and connect a groove, i.e. oil galley through the 3/16" hole to (Fig. #2) the bearing stop shoulder. (This allows a 4"x 3/32" rod to be inserted in the galley).



### Step-6

Spindle Modification – Barb Fitting Install: Press barb union into 3/16" hole drilled in step-4. Use soft hammer or brass punch. "Below image shows a recessed custom punch used for driving in the fitting".



### Step-7

Spindle Modification – Drilling the Barb Fitting: A 7/64" hole must be drilled through the bottom edge of the barb fitting that is visible through the oil galley. "Allows for oil flow from the barb fitting into the oil galley".



### Step-8

Spindle Modification – Epoxy: Now its time to epoxy seal the barb fitting and top cap the oil galley with epoxy. First clean oil galley, barb fitting and passageway; spray brake clean works nicely or clean solvent blown dry with air. Lightly coat the supplied 3/32 metal rod with grease, very thin coat is all that's needed. Lay the rod in the bottom of the oil galley, insert into hole drilled through barb fitting. The rod will be removed before epoxy sets leaving an oil passage under the seal area. Mix-up and apply epoxy around barb fitting and run bead over oil galley. Remember seal ring must be installed later over this area. Masking tape applied over the galley will help shape the epoxy and can be removed after setting. Metal rod must be removed when epoxy reaches its rubbery state. Use twisting motion to remove. A nice oil galley should be left in its place.



After epoxy is fully cured, remove tape and file away any sharp edges. Some dressing and light sanding will probably be required for proper seal ring fitting. Blow low-pressure compressed air through oil galley to remove any dirt and confirm the passageway is open.

**Installing Seal Ring:** If reusing old seal ring(s), they must be clean and damage free. Apply a thin coat of automotive silicon gasket sealer to the spindle area and inside of seal rings. Slide on the seal ring, tapping in place with hammer & wood block. Short piece of pipe the same diameter as the seal ring also works nicely. Be careful not to damage the seal ring. Wipe off excess sealer and allow to dry.

### Important!

#### **Step: 8.1**

Use a center punch, lightly tap a depression into the seal ring over the oil galley just inside of the bearing race shoulder and seal contact area centered over the oil galley. Drill a 7/64 hole down into the oil galley. Verify oil galley passage way is open and clear under seal ring to barb fitting. De-burr and smooth any rough edges, blow compressed air through the passageway to clear any drilling chips.

See Images 8.1 and 8.2 next page:



**Image: 8.1** Oil galley hole drilled in seal ring



**Image: 8.2** View of oil galley hole drilled in seal ring. Correct location is between inboard bearing and inboard hub seal lip. (Seal shown at running location removed from hub for illustration purposes)

### Step-9

Reinstall Wheel Hub(s):

**Double check cleanliness of hubs and spindles, any metal chips left behind will quickly destroy bearings!**

Use normal service procedure for reinstalling wheel hubs, except leave out the grease. Lightly oil bearings and seal before assembly. \* "Replace bearings if worn or damaged", "Always use new seals". Do not over tighten axel nut! Check with trailer or axle manufacture for proper pre-load torque specification. (Typically around 10 ft/lbs). Install new cotter safety pins.

Standard automotive type dust caps are recommended; greasing will no longer be necessary. Helps avoid accidental greasing. A thin coat of sealer is recommended when installing the caps. Paint the caps when completed. \* Obtain locally.

### Step-10

Now It's Time To Install The Compy:

Mount the oil reservoir 12" to 36" above the axle/hub. Normally on the frame rail or inside of fender. Maintain clearance for wheels, boat haul, launching variations. Connect tubing from bottom of reservoir to barb fitting installed on spindle, leaving enough slack for axel movement. Do not loop! One reservoir can accommodate up to three wheel hubs using tees.

Upper barb fitting (side of top cap) connects to the inverted "Divers Bell" Compy air chamber. Mounting location is the key to the system. Ideally bottom edge of Compy air chamber should be at the same elevation as the bottom axle spindle seal, or slightly lower. Clamping or wire-tie to U-bolts is most common. Spring center mount as shown below will usually work on tandem axle trailers. Run tubing from top of Compy air chamber to upper side barb fitting on oil reservoir. Leave slack but do not loop.



Compy Lub System installed on tandem axle boat trailer.

### Step-11

#### Filling The System:

90w gear oil is filled from the bottom up. Apply Teflon thread-sealing tape to supplied 1/8" pipe plug on hub and keep close at hand for next step. Using a squeeze bottle or pump force 90w oil through hub filler hole until reservoir is 1/2 full. On multi hub (tandem axels) stop filling the first hub soon as you see oil filling the reservoir, then continue filling process on the second hub. Install plug quickly when removing bottle.

Before installing wheels rotate hubs by hand to help work air out of system. Allow to stand about 30 minutes, add oil to reservoir to maintain 1/2 full. Install wheels. Properly torque lug nuts!



Road Test: Start with short trips (one or two miles) checking oil level periodically. It will take several thermal cycles for trapped air to work out of the system. Add oil as needed to maintain 1/4 to 1/3 cold oil level in reservoir. It will vary with temperature.

**Important:** Before subjecting your trailer axles to water submersion its critical that the fill plug on top of oil reservoir be properly tightened and sealed with Teflon tape. Compy system must trap pressurized air in reservoir when submerging, for proper operation.

Congratulations, you've successfully converted to compy oil lub system. Greasing your trailer hubs before and after boat launching is no longer necessary. Remember to check oil level and tubing condition at the start of each boating season.

Thank You For Choosing C & O Engineering Products.