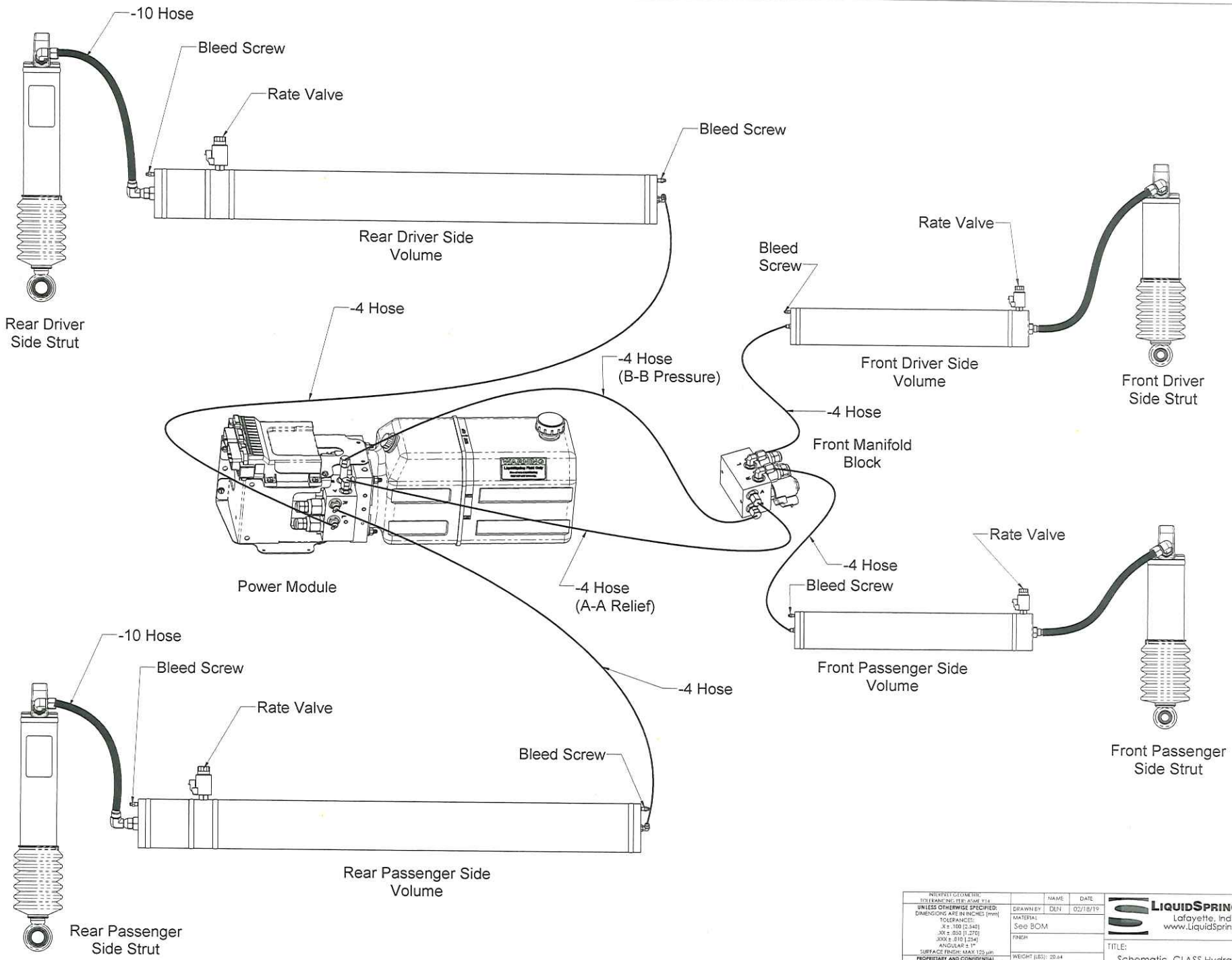
LiquidSpring

Equipped



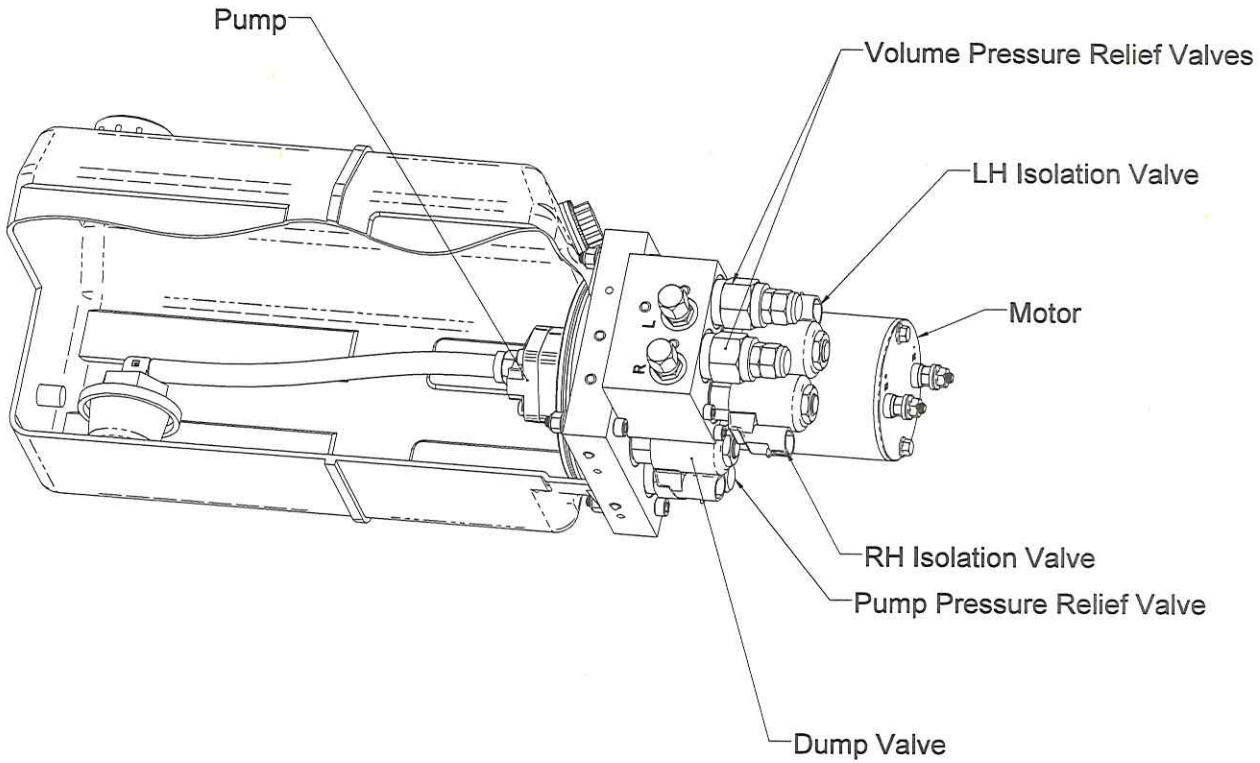
		NAME	DATE
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14	DRAWN BY	DLN	02/18/19
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm] TOLERANCES: X ± .100 [2.540] .XX ± .050 [1.270] .XXX ± .010 [.254] ANGULAR ± 1° SURFACE FINISH: MAX 125 µin	MATERIAL	See BOM	
	FINISH		
	WEIGHT (LBS): 20.64		
PROPRIETARY AND CONFIDENTIAL THIS PRINT IS LOANED ON A CONFIDENTIAL BASIS AND IS SUBJECT TO RETURN UPON DEMAND BY LIQUIDSPRING LLC. NOTHING HEREIN MAY BE USED, REPRODUCED, OR DISCLOSED, IN WHOLE OR IN PART WITHOUT THE EXPRESSED WRITTEN CONSENT OF LIQUIDSPRING LLC.	SCALE: 1:6		
	DO NOT SCALE DRAWING		
	SHEET 1 OF 1	SIZE C	

LIQUIDSPRING™ LLC
Lafayette, Indiana
www.LiquidSpring.com

TITLE: Schematic, CLASS Hydraulic 4x

DWG. NO. 10820-020

REV -



UNLESS OTHERWISE SPECIFIED:		NAME	DATE
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TOLERANCES: .X ± .100 [2.540] .XX ± .050 [1.270] .XXX ± .010 [.254] ANGULAR ± 1°	CHECKED		
SURFACE FINISH: MAX 125 µin	APPROVAL		
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5-1994	PROTO P/N		
MATERIAL	LST P/N		
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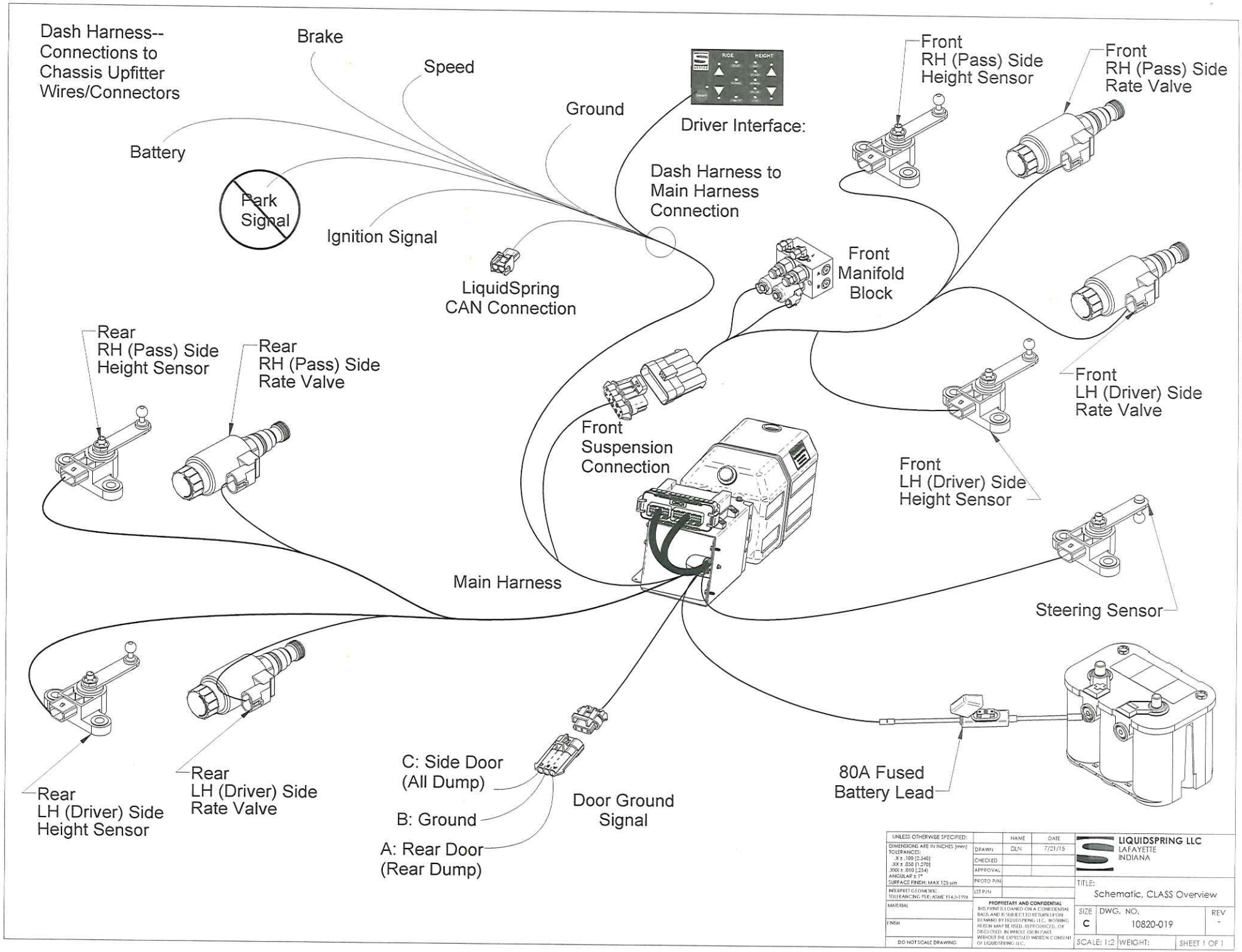
INDIANA

TITLE: Asy, Power Supply

SIZE	DWG. NO.	REV
C	10820-014	

SCALE: 1:2 | WEIGHT: | SHEET 2 OF 2



UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES [mm]	DRAWN	DLN	7/21/15
TOLERANCES: .X ± .100 [2.540] .XX ± .050 [1.270] .XXX ± .010 [.254] ANGULAR ± 1°	CHECKED		
SURFACE FINISH: MAX 125 um	APPROVAL		
INTERPRET GEOMETRIC TOLERANCING PER: ASME Y14.5-1994	PROTO P/N		
MATERIAL	LST P/N		
FINISH	PROPRIETARY AND CONFIDENTIAL THIS PRINT IS LOANED ON A CONFIDENTIAL BASIS AND IS SUBJECT TO RETURN UPON DEMAND BY LIQUIDSPRING LLC. NOTHING HEREIN MAY BE USED, REPRODUCED, OR DISCLOSED, IN WHOLE OR IN PART, WITHOUT THE EXPRESSED WRITTEN CONSENT OF LIQUIDSPRING LLC.		
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LIQUIDSPRING LLC
LAFAYETTE
INDIANA

TITLE: Schematic, CLASS Overview

SIZE	DWG. NO.	REV
C	10820-019	-

SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1

Checking Fittings for Leaks

WARNING: The system operates under high fluid pressure (up to 3500 psi). Do not attempt to locate leaks by feeling with hands or any part of the body. High pressure fluids can penetrate the skin and cause severe tissue damage.

1. While system is at ride height and pressurized, visually examine fittings and hose connections for any source of leaks. Do not use hands to search for leak. If the source of the leak is a fitting or other component, depressurize the system and repair or replace as needed.
2. Tighten hose nuts if the leak is coming from the connection between the hose nut and a fitting. Depressurize the system before tightening anything. Replace hose if the leak is coming from anywhere else on the hose.

WARNING: Never tighten a hydraulic fitting or hose under pressure. Always depressurize the system before adjusting fittings and hoses.

3. Clean all fluid from hose and fittings to visually identify any leaks.

IMPORTANT: Over-tightening hoses and fittings can damage components and lead to leaks.

See Installation Manual for additional instructions.

Service Intervals

Once Daily or Before Each Shift of Usage

- Check the suspension system to be sure it is fully operational.
  - After starting vehicle, verify all LED's on the driver display flash briefly, then the Green Ride Height and Ride Mode LED's are lit and the Red Warning LED does not stay on or flash.
  - Verify the four Yellow LED's are lit when the steering wheel is centered.
  - Verify that they system is at NORMAL ride height, with a steady green LED.
    - If the Driver Display indicates a blinking ride height LED, allow the system to complete leveling as indicated by a steady green LED.
    - If LOW or HIGH height is shown with a solid green LED, use the arrow buttons to raise or lower the suspension to NORMAL height.
    - Refer to ***Error! Reference source ot found.*** Section.
- Visually inspect struts, hoses, and fittings for signs of leakage.
  - For leakage resulting in fluid pooled on the floor greater than 1" in diameter, it is recommended to service the system immediately.
  - For signs of leakage or weeping that results in wetness on components or a single drop, it is recommended to monitor the leak and schedule repair service accordingly.

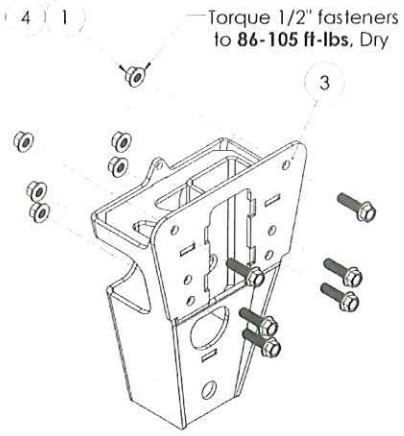
Initial 1,000 mile (1,600 km) Inspection

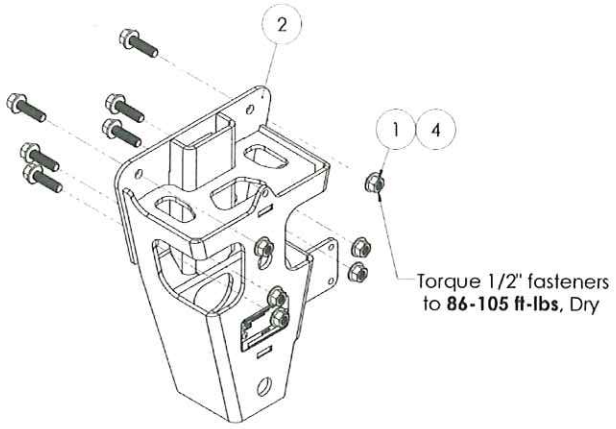
- Inspect bolts and nuts at the control arm pivots to assure they are properly torqued.
- Inspect u-bolts to assure they are properly torqued.
- Thoroughly inspect all hydraulic connections for signs of leakage.
- Inspect reservoir fluid level.

Routine Maintenance 25,000 miles (40,000 km) or 6 month maximum Interval

- Check all suspension components for any signs of damaged/broken components, looseness, or wear.
- Inspect bolts and nuts at the control arm pivots to assure they are properly torqued.
- Inspect u-bolts to assure they are properly torqued.
- Thoroughly inspect all hydraulic connections for signs of leakage.
- Inspect reservoir fluid level.

Front Hangers





ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	12	10012-007	LFN 1/2-13, Gr. G	3	1	10539-010	Weldment, Hanger, RH
2	1	10538-005	Asy, Front Hanger, LH	4	12	10885-175	HFB 1/2-13x1.75, Gr. 8

Troubleshooting

The LiquidSpring CLASS® system includes on-board diagnostics to assist in pin-pointing potential issues. When a fault in the system occurs, the red warning light on the Drivers Interface will light along with one or more of the other lights on the interface.

Driver Interface Lights	Condition	Cause	Correction
Warning + RIDE: SPORT	Battery Voltage in excess of 16VDC	Vehicle charging system providing incorrect voltage.	Inspect and replace as necessary.
		LiquidSpring system not connected to 12VDC electrical system	Inspect and replace as necessary
Warning + RIDE: NORMAL	Pump Motor runs in excess of 3 minutes	See *Issues with Vehicle Raising/Pump Section*	See *Issues with Vehicle Raising/Pump Section*
Warning + RIDE: COMFORT	Battery Voltage below 9 VDC	Vehicle charging system providing incorrect voltage	Inspect and replace as necessary
		Low vehicle battery	Inspect and replace as necessary
Warning + HEIGHT: HIGH	Issue with Right Hand Height Sensor	See *Issues with Height Sensors Section*	See *Issues with Height Sensors Section*
Warning + HEIGHT: NORMAL	System kneels in excess of 3 minutes without suspension movement	See *Issues with Vehicle Lowering/Dump Valve Section*	See *Issues with Vehicle Lowering/Dump Valve Section*
Warning + HEIGHT: LOW	Issue with Left Hand Height Sensor	See *Issues with Height Sensors Section*	See *Issues with Height Sensors Section*
Slow or Fast Blinking Warning Light	Driver Interface cannot communicate with ECU.	See ***Error! Reference source not found.***	See ***Error! Reference source not found.***

Issues with Vehicle Raising/Pump

Condition	Cause	Correction
Vehicle Leveled, Pump continues to run	Pump motor shorted out.	Contact LiquidSpring for further instructions.
	Software issue	Turn off ignition, wait 30 seconds, restart vehicle.
	Excessive noise in height sensor	See *Issues with Height Sensors*
Vehicle Not Leveled (or Raised), Pump runs	Reservoir fluid level low	Fill reservoir to specified level.
	Hydraulic leak in system	Check for fluid leaks and repair or replace.
	Vehicle overloaded	Check vehicle loading and correct.
	Air in pump	Check fluid level in reservoir and fill accordingly. Fully depressurize system and restart leveling.
	Internal leak in power module	Replace power module.
	Height sensor error	See *Issues with Height Sensors*
Vehicle Not Leveled (or Raised), Pump does not run	System not turned on.	Turn system on.
	Blown fuse	Check system fuses
	Loss of electrical power	Check wiring between power module and battery.
Pump runs for short time then stops	Motor controller over temperature	Contact LiquidSpring for further instructions.
Pump runs intermittently	Loose connector or wiring	Check wiring harness connections and battery connections. Repair as necessary.

Issues with Vehicle Lowering/Dump Valve

Condition	Cause	Correction
Vehicle does not lower (kneel).	System not turned on	Turn system on
	Blown fuse	Check system fuses and replace as necessary
	Obstacle under vehicle frame	Remove obstacle
	Wiring harness disconnected	Check wiring harness connections and reconnect
	Loss of electrical power	Check wiring between power module and battery
	Power module filters plugged	Contact LiquidSpring for further instructions
	Internal power module blockage	Contact LiquidSpring for further instructions
Vehicle slow lowering (kneeling)	Partial internal power module blockage	Contact LiquidSpring for further instructions

Ford F-450 Suspension

Overview

Drawings

Literature

Literature Download

Download and view detailed information about this system:

- Application Guide
- CLASS Quick Reference Guide
- Warranty Information

2017 F-450 Suspension Manuals

- **Suspension Serial Numbers 2003717 and Higher**
  - Sales Brochure
  - Installation/Operator Manual

2011-2016 F-450 Suspension Manuals

- **Suspension Serial Numbers 2001435 and Higher**
  - Sales Brochure
  - Installation Manual
  - Operator Manual
- **Suspension Serial Numbers 2001434 and Lower**
  - Sales Brochure
  - Installation Manual
  - Operator Manual
  - Installation Checklist
  - Fastener Cross-over List

2008-2010 F-450 Suspension Manuals

- **Suspension Serial Numbers 2001435 and Higher**
  - **Sales Brochure**
  - Installation Manual
  - Operator Manual
  - 2010 and Earlier Manual Addendum
- **Suspension Serial Numbers 2001434 and Lower**
  - Installation Manual
  - Operator Manual
  - Installation Checklist
  - Fastener Cross-over List
  - 2010 and Earlier Manual Addendum