LUBRIQUIP®
Lubrication & Dispensing Solutions

Trabon®

Broken Line Indicator
Product Spec and Ordering

Bulletin 15416

DESCRIPTION

Broken Line Indicators are small monitoring devices which are installed in divider valve outlet ports for terminating oil, terminating grease or recirculating oil systems. They are designed to monitor (protect) line integrity of lubricant transmission lines for critical bearing points on a machine.

Broken Line Indicators provide a visual indication at the divider valve outlet of the lubrication point being monitored to enable easy location of broken lines (severed or leaking connections). The Indicator also generates a central high-pressure warning (via pressure switch) in the main line between the pump and master divider in the event of line breakage if so equipped.

The Broken Line Indicator Kit includes an Indicator and Simulator. The Simulator is a preset relief valve. It is an O-ring sealed, piston-type relief valve for positive retention of line pressure (See Figure 2 for cut-away views).

The Indicator is installed in the Divider Valve outlet port and the simulator is installed in the bearing tap. It is highly recommended that performance indicators (reset with memory type — reference Literature 15401) be installed in the indicator ports of the master divider to assist in troubleshooting the system. Pressure rating of the performance indicators will be the same as the Indicator rating.

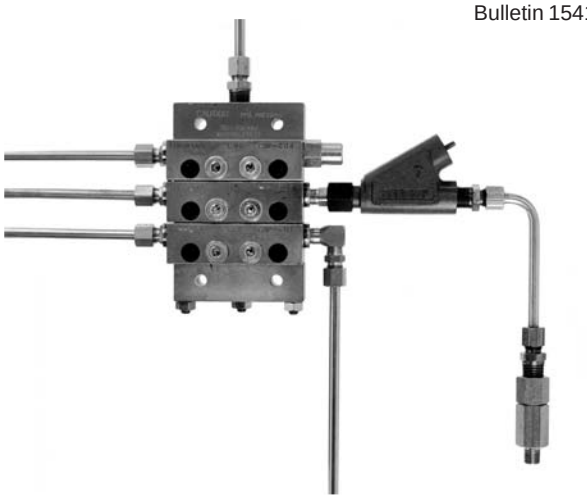
OPERATION

During normal operation, lube pressure is maintained in the bearing line between the check valve and the bearing by the pressure Simulator. (See Figure 2.) The maintained lube pressure acts on the plunger O-ring seal diameter and keeps the Indicator Pin and plunger in the extended position.

In the Broken Line Indicator a steel ball on the plunger is held against the ball seat by spring force. As lubricant flows past the check valve, lube pressure acting against the ball seat area must overcome the spring force to allow flow. The area of the ball seat in combination with the spring force requires a high pressure to be developed by the pump. The pressure required to unseat the ball is the signal pressure which must be detected by the pressure switch to show a broken line fault. In addition this pressure signal must be ignored and the performance indicators will have to be reset (push the pins in) during start-up and system bleeding. Once the delivery line is filled with lubricant, the simulator, which acts as a relief valve, must be overcome. The pressure required to overcome the Simulator is sufficient to keep the Indicator Pin completely extended. The Broken Line Indicator will remain in this position so long as pressure is maintained in the line. Occasionally, after periods of long shutdown of equipment or lube systems it may be necessary to repeat the process of ignoring initial pressure indications. This is due to variations in pressure in the protected line resulting from temperature changes and/or minor leakage of fittings or check valves.

If the lubrication line is broken, the pressure is relieved and the spring returns the plunger to the seated position, retracting the Indicator Pin. During successive lube cycles a high pressure signal is generated in the main line, required to unseat the ball. This will be repeated each cycle as there is no pressure in the lubrication point line to keep the Indicator Pin extended. Thus a high-pressure central warning is generated due to a broken lubrication point line.

Broken lines can be located quickly by simply checking the pin positions of the Broken Line Indicators. Since the pin portion of the piston is normally extended a retracted pin gives visual evidence of the location of a broken line.



SPECIFICATIONS

Indicator Body Material	Aluminum
Simulator Body Material	Steel
Lubricant Supply	Oil or Grease
Seals	Buna-N

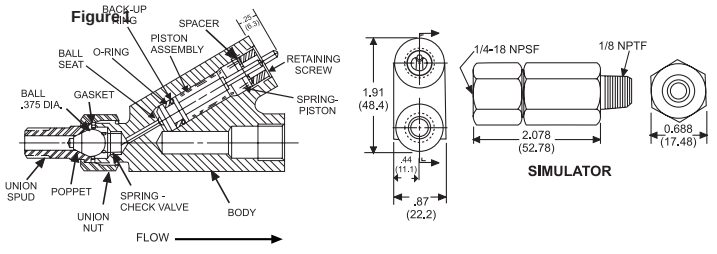
INSTALLATION INFORMATION

Installing the lube Broken Line Indicator into the lube system requires following some simple guidelines.

1. Put 1/4" spacers between the divider valve and mounting area.
2. Use pipe sealant (not Teflon® tape) to assure “0” line leakage.
3. Install the Simulator as close to the monitored lube points as possible.
4. Keep lube lines short - 3/8" maximum diameter - non-expanding material for terminating systems.
5. Select and install the correct pressure switch - Reference Literature 15521.

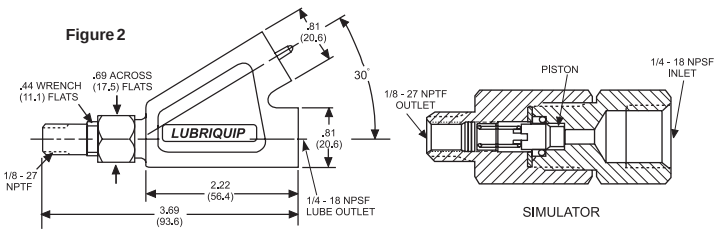
For complete Product Service/Maintenance information see Literature No. 30110.

Figure 1



BROKEN LINE INDICATOR

Figure 2



BROKEN LINE INDICATOR

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SELECTION INFORMATION

In order to select the correct Broken Line Indicator Kit for a lube system it is important to know the Systems operating pressure. Selecting a BLI Kit without that information would require use of the following Tables and Graphs.

For a terminating grease system the 1500 psi BLI Kit would be used following the guidelines in Table 2 for tubing lengths.

If the application is a circulating oil system use the graphs which show typical MX, MX to MSP or MSP systems.

For typical terminating oil systems the 1000 psi BLI Kit would be selected per Table 1.

Table 1.

TYPE SYSTEM	BLI RATING	SIMULATOR RATING	ΔP	PRESS. SW. SETTING (PSI)	PUMP RELIEF VALVE (PSI)	BLOW-OUT DISC (PSI)	MIN. PUMP CAPACITY (PSI)	BLI KIT	BLI	SIMULATOR
Re-Circulating Oil (*1,2)	500	60	440	400	700	N/A	1000	463-440-000	463-400-000	463-420-000
Re-Circulating Oil (*1,2)	1000	100	900	850	1,400	N/A	1500	463-440-010	463-400-010	463-420-010
Terminating Oil	1000	100	900	850	N/A	1450	2500	463-440-010	463-400-010	463-420-010
Terminating Grease (*4)	1500	150	1350	1300	N/A	2350	2500	463-440-020	463-400-020	463-420-020

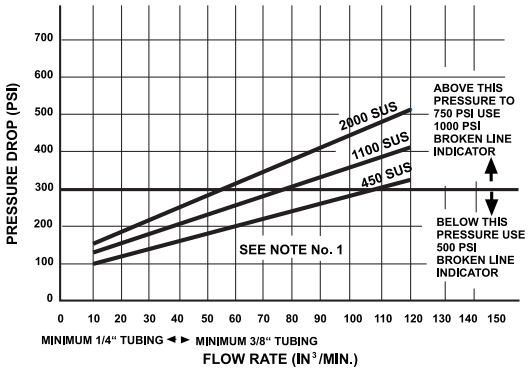
*** Notes:**

(1) Consult operating pressure graphs for selection of proper broken line indicator for Circulating oil systems.
(2) Circulating oil systems with flow rates above 30 in^3/min. should have an accumulator at the power Unit.
(3) Pump flow controls are recommended to eliminate pressure surges (pneumatic and hydraulic pumps).
(4) See Table 2 for recommended maximum line size and length.
(5) At temperatures below 50 degrees F. it may be necessary to set the pressure switch at a higher level, but it should never exceed the pump blow-out disc rating or pump capacity.
(6) The above data is based on typical installations and is to be used as a guideline only. Consult the factory for applications not covered above.

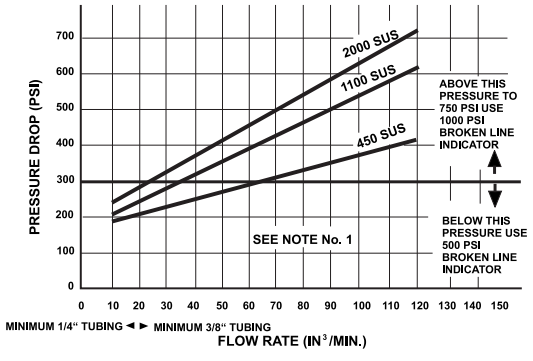
NOTES:

1. The following graphs are based on 3 Section feeder manifolds with average displacements. Pressure drop will vary slightly depending on specific manifold size and capacity. The graphs **do not consider** injection pressures. These must be added to the pressure drops.
2. Use graphs only to approximate system cycle pressure for selecting the appropriate broken line indicator.
3. Single stage system operates at approx. 70% of 2 stage system.
4. In using provided graphs, use the highest viscosity rating of the specific lubricant used considering ambient temperature.
5. Max. cycle rate for unattached proximity switch is 60 cycles/mm.
6. Max. cycle rate for attached proximity switch is 120 cycles/mm.

Typical Operating Pressure For 2 Stage "MX" System



Typical Operating Pressure For 2 Stage "MX" to "MSP" System



Typical Operating Pressure For 2 Stage "MSP" Systems

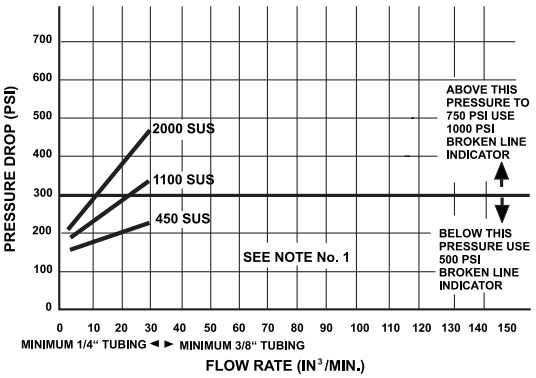


Table 2. Broken Line Indicator-Maximum Line Lengths Permitted in Grease Systems

LINE SIZE	TEMP F°	MAXIMUM\ LENGTH (FEET)
1/4 T	70	10
3/16,1/4 H	60	10
1/8 P	50	10
	40	5
3/8 T	70	20
5/16, 3/8 H	60	15
1/4 P	50	10
	40	10
1/2 T	70	25
13/32,1/2 H	60	20
3/8 P	50	15
	40	10

T = Tubing* *Based on the following nominal I.D.
H = Hose 1/4 Tube – 0.188 I.D.
P = Pipe 3/8 Tube – 0.312 I.D.
1/2 Tube – 0.438 I.D.

NOTE: The above data are guidelines for sizing the line between the Broken Line Indicator and the Simulator and are based on NLGI No.1 and lower grease at the stated temperature. Contact factory for greases heavier than NLGI No.1 or temperatures colder than shown. Refer to Bulletin 30110 for detailed application information.

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