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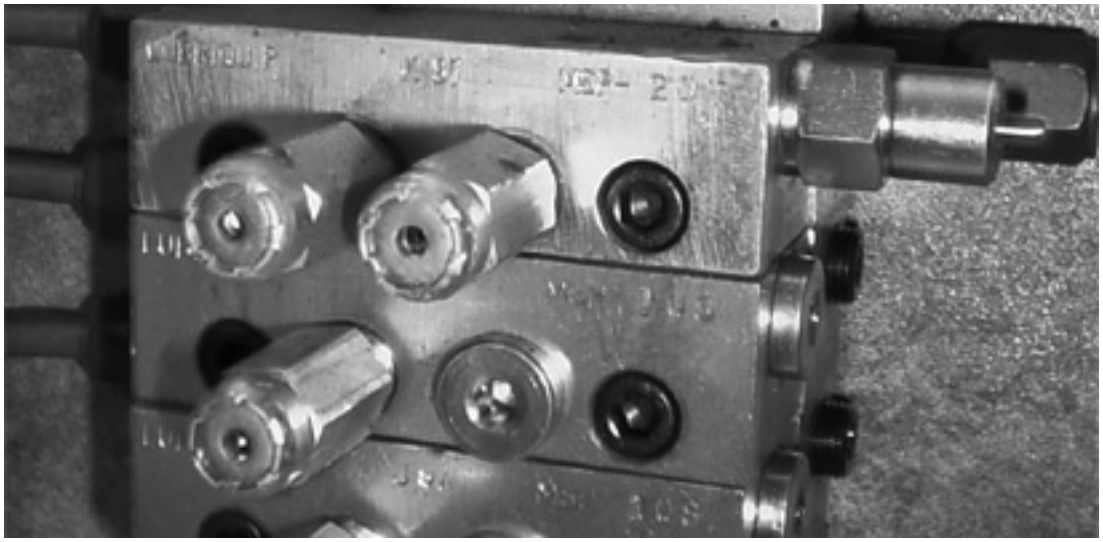

Arguably the best engineered of all lubrication systems, the Series Progressive (or Single Line Progressive) system pumps oil or grease in either a cyclical (total loss) or continuous (recirculative) manner. Engineered to positively deliver an exact displaced amount of lubricant to every single bearing point, the divider block design is capable of operating in severe environments and accommodating upwards of 200 delivery points in a single pump system.

Today, most lubrication OEMs offer a version of this popular system type. The original model—*designed and developed in the U.S. by the Lubriquip organization in the early part of the 20th century and marketed under the Trabon name*
—continues to be sold today.

How This System Works
A lubricant pump is connected to an engineered network of series progressive divider blocks, and via a controller is allowed to pump lubricant in a continuous or controlled cyclical systematic manner to each divider block.

Divider blocks, which are built in a modular style, contain a series of lapped, hydraulically actuated spool valves sized for varying displacements. The ability to "cross-port" a valve results in "doubling" the delivery of lubricant on one side of the valve only. The valves are progressively

linked together in series, causing them to "shuttle" over to one side of the block in a progressive pattern, then to "shuttle" back to their original positions as the lubricant continues to be pumped through the block. Because of its hydraulic nature, as a valve is shuttled back and forth, it displaces a lubricant charge on one end of the valve to the bearing point, while simultaneously filling the void on the other side of the valve in preparation for displacement once the valve "shuttles" back.

Monitoring The System

To ensure every point has delivered a charge of lubricant, the first valve in the divider block can be attached to a cycle pin indicator that visually indicates the block has completed one full cycle by moving in and out one time. Attaching a counter/timer control to the cycle pin will indicate if no delivery has taken place within a given time period and signify a broken main delivery line.

Blocked and crimped lines can be visually detected via simple mechanical overpressure indicators connected at the secondary delivery-line block outlet. Whenever a "restriction"-caused hydraulic backpressure is sensed, a visual indicator pin "pops" up to indicate the exact line/bearing point requiring maintenance. If no electronic alarm sensors are used, operations and/or maintenance must perform regular visual checks for alarm indications.

The Pros & Cons

With some basic TLC, the Series Progressive system type will deliver trouble-free service for many years, thanks to its engineering and tamper-proof design. With the blocks' modularity, replacement parts are relatively inexpensive to purchase, stock and replace. As the accompanying divider-valve photo shows, the system can even be used with a manual grease gun to deliver an engineered amount of lubricant to each bearing point, and be automated later. (NOTE: The photo on page 16 clearly shows the block cycle pin and four overpressure indicators in "run" position.)

The downside of the Series Progressive system is the difficulty in adding points once the initial system is installed—*although this can still be achieved*. Moreover, in comparison to other single line systems, the Series Progressive type demands more system engineering. The plus side to this, however, is that every system is engineered by the vendor specifically for your application, and provided with schematics and a Bill of Material to include in your CMMS and/or maintenance files.

Coming Up

In the next issue, we'll discuss Single Line Resistance (SLR) centralized lubrication delivery systems. **LMT**

For more details on centralized lubrication systems, see Ken Bannister's book, *Lubrication For Industry* , published by Industrial Press, or contact him directly. Phone: (519) 469-9173; e-mail: kbannister@engtechindustries.com.

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