

## RECOMMENDED HYDRAULIC SYSTEMS CONVERSION PROCEDURE

### QUINTOLUBRIC® 888 SERIES

#### Overview

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This document contains procedure guidelines for the conversion from both water free and water based hydraulic fluids to QUINTOLUBRIC® 888. The final procedure can change depending on local circumstances, and it is recommended to consult your local Sales Representative prior to starting the conversion.

#### General points:

When converting a hydraulic system to a QUINTOLUBRIC® 888 Series fire resistant hydraulic fluid, it is important to follow the accepted engineering practices.

- Fluid contamination should be minimized, particularly contamination by excessive amounts of residual hydraulic fluids that may remain during system conversion
- Make sure QUINTOLUBRIC® 888 is compatible with the fluid to be replaced, as well as components, seals, paint etc.
- For best results, the hydraulic system should be drained as much as possible and flushed
- Over time any acid scavengers in use should be removed
- It is recommended to contact your local Quaker Houghton sales representative to fine tune the change over procedure to your specific needs
- Take a sample of the fluid in the system after the conversion to determine the condition of the fluid and check if the conversion was successful

#### Water Free Conversion

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Fluid Types include:

- Mineral Oil
- Phosphate ester (HFDR)
- Polyol ester and PAG (HFD-U)

The recommended conversion procedure described below is intended to minimize the residual water free hydraulic fluid content following a conversion to the QUINTOLUBRIC® 888 Series. Most OEMs also have a conversion procedure in place.

1. Drain the **water free hydraulic fluid** from the system reservoir. Any build-up of dirt in the reservoir should be removed. Where feasible, drain fluid from accumulators, cylinders, and lines.
2. Refill the system reservoir with at least the minimum quantity of QUINTOLUBRIC® 888 Series necessary for proper operation of the system. Turn on the power unit and actuate all cylinders for several cycles, to move the QUINTOLUBRIC® 888 Series throughout the system circuitry. Continue to flush for several hours. Drain the QUINTOLUBRIC® 888 Series/ **water free hydraulic fluid** mixture as per step 1.
3. Refill the system reservoir with the QUINTOLUBRIC® 888 Series. Filter elements should be checked periodically and replaced if necessary, following the conversion.
4. Submit the QUINTOLUBRIC® 888 Series fluid to the sample and analysis program.

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### Initial Operation

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During the initial operating period, dirt deposits in the hydraulic circuitry can be loosened and suspended during the fluid changeover, so monitoring the filter elements for a time is a good precautionary measure.

**Water free hydraulic fluid** and the QUINTOLUBRIC® 888 Series in general are miscible and compatible with each other, but residual **water free hydraulic fluid** can have an effect on the properties of the QUINTOLUBRIC® 888 Series.

- For Mineral Oil based Hydraulic Fluid we recommend a residual oil content < 5 % ( to not jeopardize the Fire Resistance)
- For phosphate esters we recommend a residual oil content < 2.5 % (to avoid the CMR properties of P-esters)
- Polyol and PAG based Water free Fire Resistant Hydraulic Fluids ( HFDu ) can have a clear limit of residual fluid. It has to be judged case by case
- Contact the local Quaker Houghton representative for assistance

### Water-based Conversion:

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Water-based fire resistant hydraulic fluids like water glycol HFC and invert emulsions HFB do not mix with the QUINTOLUBRIC® 888 Series. It is detrimental to have a significant amount of residual water in the QUINTOLUBRIC® 888 Series for an extended period of time. The recommended conversion procedure is intended to minimize the amount of residual water based fire resistant hydraulic fluid present following a conversion to the QUINTOLUBRIC® 888 Series.

1. Drain the water-based hydraulic fluid from the system reservoir. Any build-up of dirt in the reservoir should be removed. Where feasible, drain fluid from accumulators, cylinders and lines.
2. Refill the system reservoir with at least the minimum quantity of flushing fluid recommended by your local Quaker Houghton Sales Representative, necessary for proper operation of the system. The choice of flushing fluid can fluctuate per specific situation.
3. Turn on the power unit and actuate all cylinders for several cycles to move the flushing fluid throughout the system circuitry. Ideally, the flushing should be continued for a twenty-four (24) hour period, with periodic actuation of the cylinders. When not feasible, continue to flush for several hours. Drain the flushing fluid as per step 1.

4. Steps 1-3 should be repeated until the water contamination in the flushing fluid is < 0.2 % ( < 2000 ppm ). If needed a centrifuge or a vacuum dehydrator can be used
5. Refill the system reservoir with QUINTOLUBRIC® 888 Series. Filter elements should be checked periodically and replaced if necessary, following the conversion
6. Submit a sample of the QUINTOLUBRIC® 888 fluid to the sample and analysis program following the conversion. The amount of residual water contamination plus standard QUINTOLUBRIC® 888 Series operating specifications will be determined and reported. This sampling program should be continued until satisfactory operation and fluid condition is well established

### Initial Operation

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During the initial operating period, dirt deposits in the hydraulic circuitry can be loosened and suspended during the fluid changeover, so monitoring the filter elements for a time is a good precautionary measure.

### Compatibility

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#### Metals:

QUINTOLUBRIC® 888 Series is compatible with iron and steel alloys and most nonferrous metals and their alloys. It is not compatible with lead, cadmium and has limited compatibility with alloys containing high levels of these metals. QUINTOLUBRIC® 888 Series has limited compatibility with hot dipped or electro galvanized surfaces and good compatibility with zinc containing alloys.

Suitable substitutes for these materials are available and should be used.

#### Paints and Coatings:

QUINTOLUBRIC® 888 Series is compatible with multi-component epoxy coatings. It shows limited compatibility with one component (zinc-dust containing) coatings. Specific coating and application recommendations can be obtained from coating manufacturers or directly from Quaker Houghton.



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### Other Fluids:

QUINTOLUBRIC® 888 Series is compatible and miscible with nearly all mineral oil (extra attention in case a HLP-V or HLP-D is in use) and polyolester-type hydraulic fluids and with some, but not all, phosphate esters. It is not miscible or compatible with water-containing fluids. For conversion recommendations, please contact Quaker Houghton.

### Seals, Hoses, and Packings:

Most standard materials like NBR (ISO 1629) are compatible, but because of the number of material types available and variations in their application, specific recommendations should be solicited from the materials manufacturer, or the Quaker Houghton laboratory. Excellent results are obtained with FPM (ISO 1629) and is therefore recommended for higher system temperatures.

