Improved Control of Scavenger Pump on 5000 Bodymakers

CATEGORY: Recommended at Next Maintenance

Summary: CarnaudMetalbox Engineering have made some modifications to the to the control and monitoring of the clutch oil system on the 5000 Bodymaker. These modifications remove two possible causes of Clutch Oil leakage which can occur under some circumstances.

Modification 1

In normal operation the Clutch Pump runs continuously, pumping oil from the Clutch Oil Tank on the Hydraulic Power Pack to the Clutch on the Bodymaker. This oil then drains into the Scavenger Tank. A level sensor in the Scavenger Tank (LLS2) monitors the level of the oil there, and when this sensor has been covered for 20 seconds the Scavenger Pump starts in order to pump the oil back to the Clutch Tank. This pump runs until the level sensor has been uncovered. The oil level will then begin to rise again in the Scavenger Tank and when the level sensor has been covered for 20 seconds the Scavenger Pump will start again. Thus in normal operation there is a continual interchange of oil between the Clutch Tank and the Scavenger tank. Over time, oil is lost from the system and when the oil level becomes too low this is detected by a level sensor in the Clutch Oil Tank (LLS3). In the unmodified program the low oil condition will inevitably occur when the oil in the Scavenger tank is at its highest level. If the Clutch Oil Tank is then filled up to its top level there is a risk that the system might be overfilled and oil may leak out between the Flywheel and the Quill. To prevent this happening the Scavenger Tank Low Level Sensor should be added into the program so that the low Clutch Oil condition is only detected when the scavenger tank is also at its low level.

Modification 2

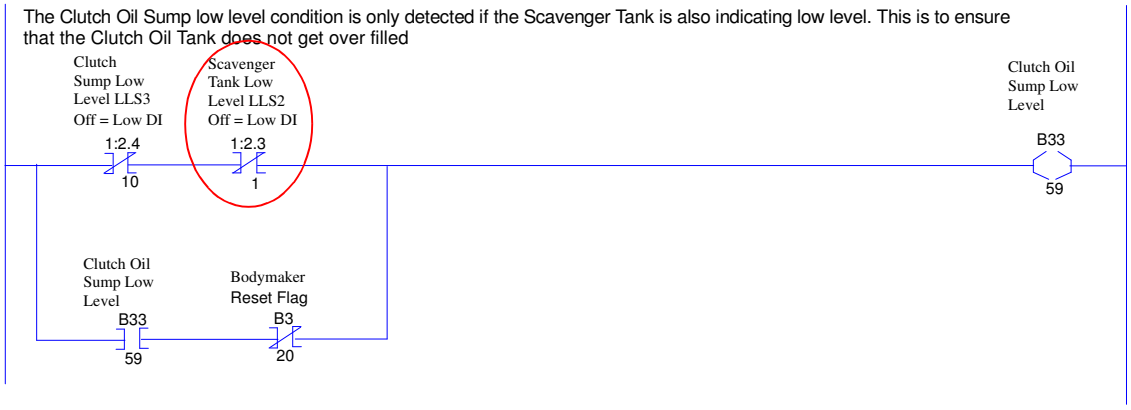
As described previously the Scavenger Pump will start to pump oil back to the Clutch Tank after the Low Level Sensor has been covered for 20 seconds. However in the unmodified program, if the Low Level sensor appears to uncover at any time during the 20 second period the timer will reset and it will be another 20 seconds before the Scavenger Pump starts. This "apparent uncovering" may be caused by a marginally adjusted level sensor or by agitation of the surface of the oil in the Scavenger Tank. This modification (see next page) adds a timer into the program to eliminate short duration "uncoverings" of the sensor.

These improvements are applicable to all 5000 Bodymakers fitted with Hydraulic Clutches serial number 257 or below. Machines from serial number 258 were built with this revised method of control. No parts are required for this modification, only the PLC program needs to be changed, which should take no more than 15 minutes per machine. The example programs are "typical" and may not show exactly the same addresses as any particular customer's machine program, however they should serve to allow the customer's electrical personnel to implement the modification on their particular program.

For further information about this modification please contact CarnaudMetalbox Engineering quoting Technical Bulletin number TB5000-045. If you require specific advice on how to modify your PLC program please send

Modification 1

This rung detects if the oil level in the Clutch Tank on the Hydraulic Power Pack is too low, and turns on B33/59 if it is. To modify the rung add the LLS2 contact where shown so that the low level condition is only indicated when the Scavenger Tank is also empty of oil



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a copy of your program and the machine serial numbers
by email to: Electrical-GBR-Shipley@eur.crowncork.com

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Modification 2

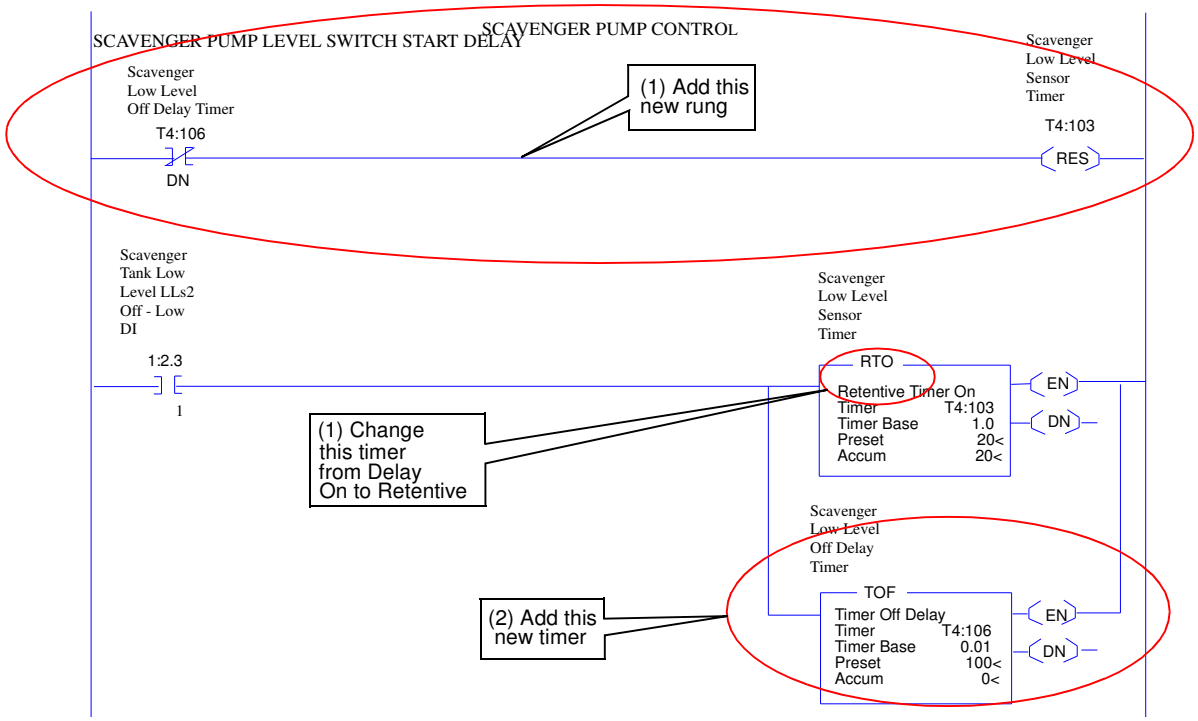
The changes made here are as follows:

1) T4:103 is made retentive, so that if the Scavenger Low Level Sensor appears to uncover briefly the timer does not reset to zero. This requires the additional rung to reset T4:103.
2) T4:106 is added so that the Scavenger Low Level sensor must be uncovered for 1 second before the program recognises that it is uncovered
3) The rung controlling the Scavenger pump needs the changes shown

The end result of these changes is as follows:

a) If the Scavenger Low Level Sensor uncovers briefly (for less than 1 second) before the 20 seconds has elapsed (i.e. while the Scavenger Pump is not running) it will not reset to zero, the timer will continue to time to 20 seconds and so the pump will start when expected

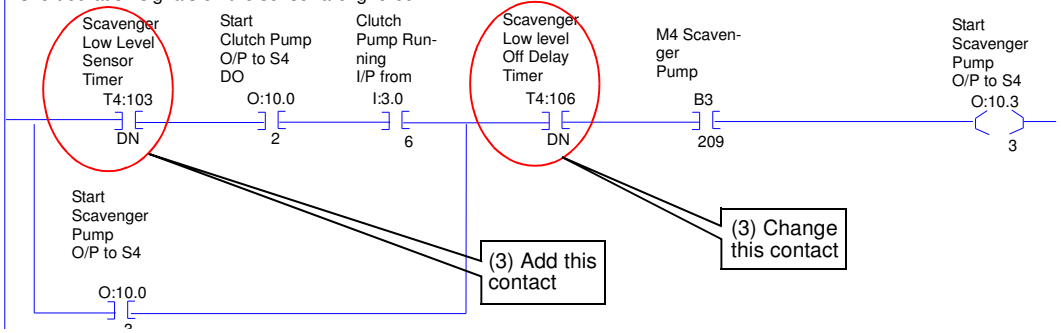
b) If the sensor uncovers briefly (for less than 1 second) while the pump is running the pump will no longer stop, it will continue to run until the sensor has been uncovered for 1 second.



Scavenger Pump Control

The Scavenging Pump starts automatically when the Low level Sensor has been covered for a time set in T4:103 and stops when the oil has fallen to low level, provided the clutch pump is running. However, even if the clutch pump is not running the pump will always complete a cycle and empty the scavenger tank.

T4:106 ensures that the pump does not stop until the Low Level Sensor has been uncovered for at least 1 second so that short duration signals on the sensor are ignored.



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