

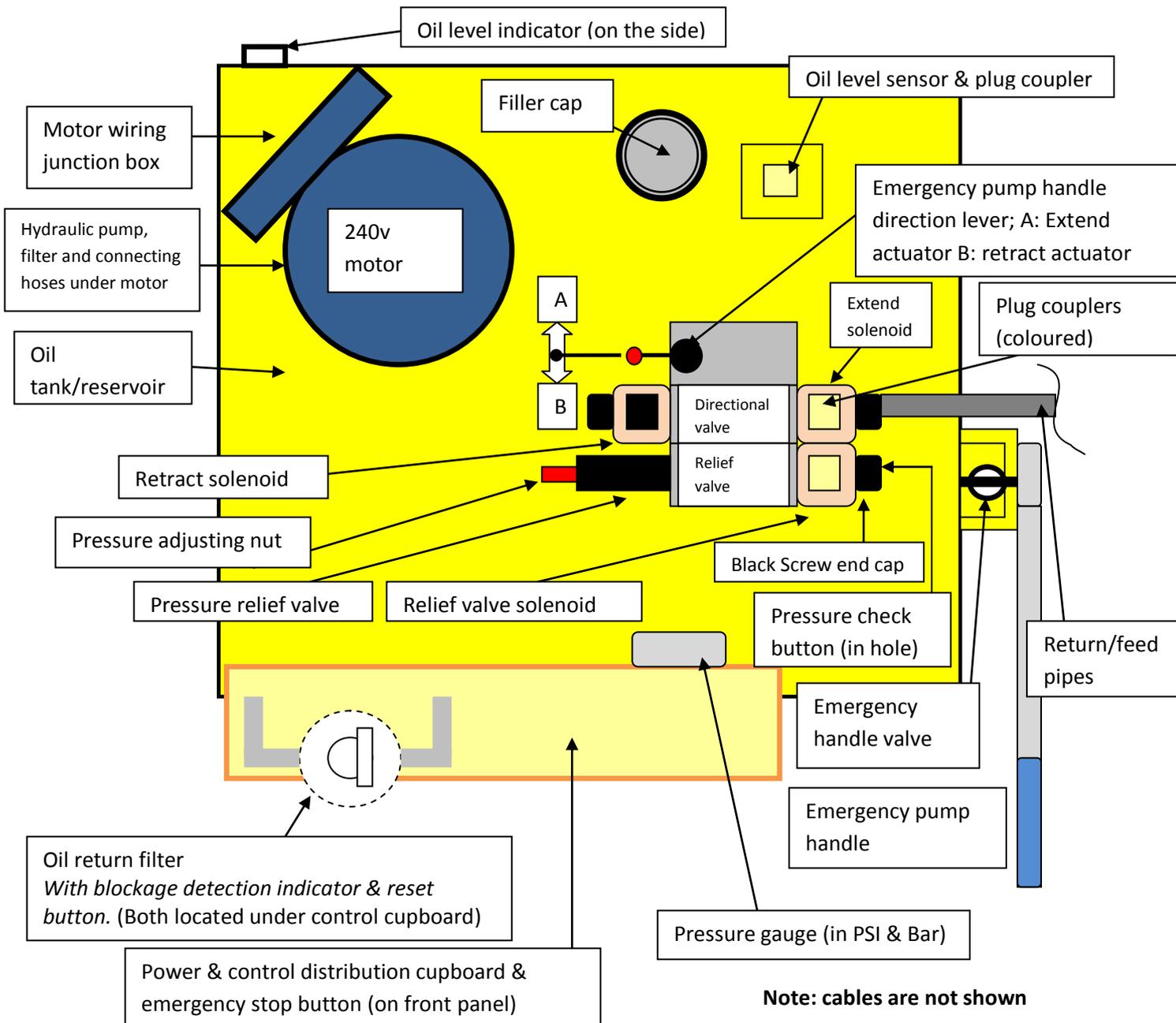
Useful Notes:

Brigg Gates: Hydraulic Unit

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*These notes are uncontrolled and NOT Network Rail endorsed,
they are for information and guidance ONLY, NOT for testing or commissioning
purposes.*

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Note: cables are not shown

Basic operation:

Signaller releases gate rail stops and pulls up emergency button on control pedestal, presses start button and buzzer sounds.

Motor starts up and signaller moves the joystick to required direction. Depending on direction required a solenoid on directional valve is energised and also the relief valve is energised. The electromagnet energised at around 24v DC releases the solenoid to allow oil to flow to the correct pipe which supplies the hydraulic actuator.

Emergency pump operation:

REQUEST OPERATION FROM SIGNALLER FIRST: REMEMBER TRAFFIC MAY STILL BE GOING OVER CROSSING
IMPORTANT: THE GATESTOPS WILL HAVE BE SET FIRST; SERIOUS DAMAGE WILL OCCUR IF NOT DONE

Press emergency switch on front of control panel to cut off power to motor. Turn emergency handle valve anti-clockwise to open valve. Turn emergency pump handle direction valve to required position depending on current position of hydraulic actuator. Pump emergency handle. REMEMBER to return all levers, valves & buttons to normal position.

Faults:

• **No power:**

Check the following; signallers/control cupboard emergency stop button not activated. Main switch on control panel on. Trip switch on main distribution not tripped.

Faults - continued:

- **Motor will not run (*main power present*):**

Inside the control cupboard check the small trips have not tripped out. Check oil level is sufficient (low oil level warning light lit on signallers panel). Check wiring is secure inside motor wiring junction box and distribution cupboard. Motor jammed/damaged/burnt-out.

- **Hydraulic actuator fails to move (*and pump/motor is running*):**

Obvious oil leaks or kink in hoses. Flow control valves (in the ends of hydraulic actuators) are incorrect set/closed. Mechanically jammed; disconnect rodding and retry. Use emergency pump to rule out pumping side. Emergency handle valve is open (set-up for emergency handle pumping). Incorrect command from control unit. Solenoids faulty/unplugged.

- **Erratic operation:**

Mechanically obstructed/rodding heavy operation. Air bubbles in oil. Incorrect command from control unit. Worn/damaged motor and/or pump. Blocked filter(s).

- **Slow movement (in both or one direction):**

Oil leakage; if none obvious on outside, leakage could be internal. Incorrectly set relief valve (see adjustments section). Worn/damaged pump and/or motor. Fluid viscosity wrong. Fluid badly contaminated/frozen. Filter(s) blocked. Kinked/blocked hoses. Incorrectly set command from control unit. Flow control valves incorrectly set.

- **Excessive fast movement:**

Incorrectly set relief valve. RPM of motor too high (incorrect replacement fitted?) If excessively fast during parts of the movement; the gates could be jamming and releasing suddenly.

- **Fails to move in one direction:**

Use emergency pump to rule out electrical pump. Directional solenoid faulty; unplug coupler and check with meter (between 19.2 & 28.8 Volts DC), if voltage present, magnet or solenoid faulty (change with other magnet to check). Mechanically choked; remove rodding and try off-load.

No command from signallers joystick, check voltage and connections; are relays in control cupboard picking? Internal leakage in oil reservoir from return or feed lines.

To remove magnet: unscrew black end cap and pull off magnet (caution: small washers are present).

Adjustments/specific settings:

Running pressure (read on pressure gauge) should be between 70-80bar, when motor running and off-load (gates not moving). To check follow this procedure:

1. Start motor running.
2. On pressure relief valve, insert small pin into end and press (see diagram).
3. Off-load reading should be obtained.
If incorrect, adjust as follows:
4. On the other side of relief valve there is a lock nut and adjusting nut (see diagram).
Whilst motor is still running, adjust the screw to obtain correct reading.
REMEMBER to lock-off the lock nut after adjusting.

After adjusting; always be extremely careful when moving the gates on power; excessively high pressure may severely damage the hydraulic actuator and/or rodding/gates. The signaller should always 'feather' the power during all operations to avoid over-powering.

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Adjustments/specific settings – continued:

Flow control/shut-off valves:

These are fitted to the ends of the actuators and have a numbered dial.

These valves are used to either shut off the actuator inlet/outlets, or used to control the flow of hydraulic oil to 'balance' the action i.e. if one direction is quicker than the other and the relief valve is correctly set, the valves can be altered to correct the flow.

These valves are normally left fully open: if adjusted, the settings should be noted.

Control unit (proportional amplifiers):

These are situated in the control cupboard and control the solenoids for the directional valves and the relief valve operation. Although notes are contained within this folder, they have been set-up on installation and do not normally need adjustment.

If adjustment is needed however, the positions of all setting screws MUST be recorded before adjustment takes place.

Oil Return filter blockage indicator (*under the control cupboard*):

The indicator consists of a clear plastic window. If a blockage is detected, the window will turn red. The filter must be cleaned/renewed and the reset button (on the side of the black circular device) be pressed to return the window to clear.

Disclaimer:

Please note: as the actual unit at Brigg had no diagrams or operational instructions, these notes have been prepared by researching operational equivalent equipment, therefore the faulting procedures are not exhaustive and fault diagnosis may not be accurate.

In the event of failure and all procedures in this document have been followed and no fault found, a hydraulics engineer should be called.

The author cannot be responsible for any actions taken whether this document was followed or not. All actions remain the responsibility of the technician in charge of faulting and maintenance procedures.

Also because the equipment is non-standard equipment, SMTH procedures do not apply on the hydraulics system, although some steps can be consulted if the wiring, hoses and actuators are removed/renewed.

No wiring shall be disconnected/removed without a temporary drawing AND labelling being carried out first, as no diagrams exists at present.

REMEMBER: the general public are at risk of injury whilst any work is carried out. It is recommended to have the gates chained and locked if any parts are renewed and to also have a 'crossing attendant' (one person from the S&T team) standing by to warn the public of any sudden closures, although depending on the part to be renewed and tested, a road closure may be the safest method. A line blockage MUST be applied before any work takes place.

END.