

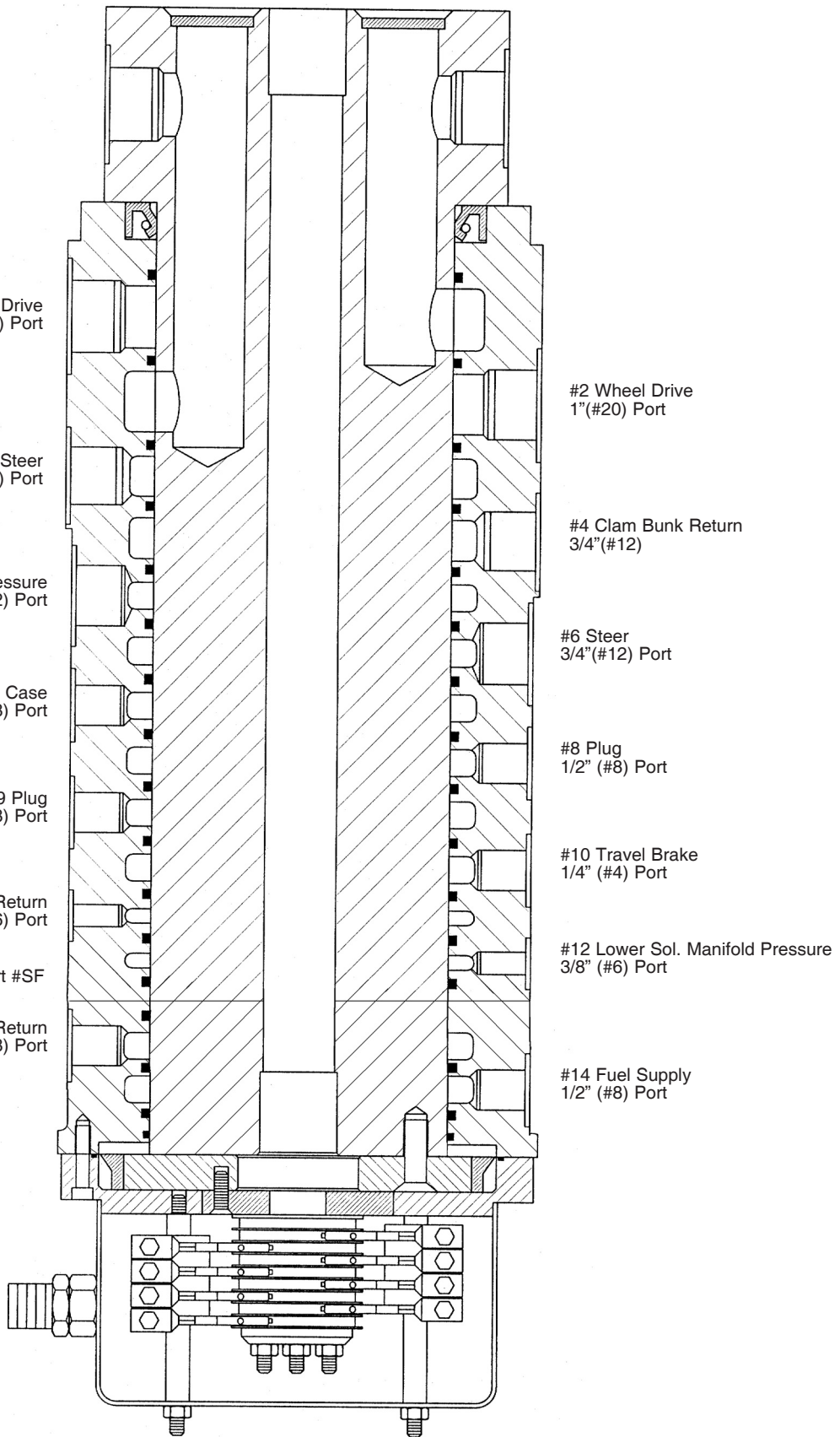
# Section 8.1

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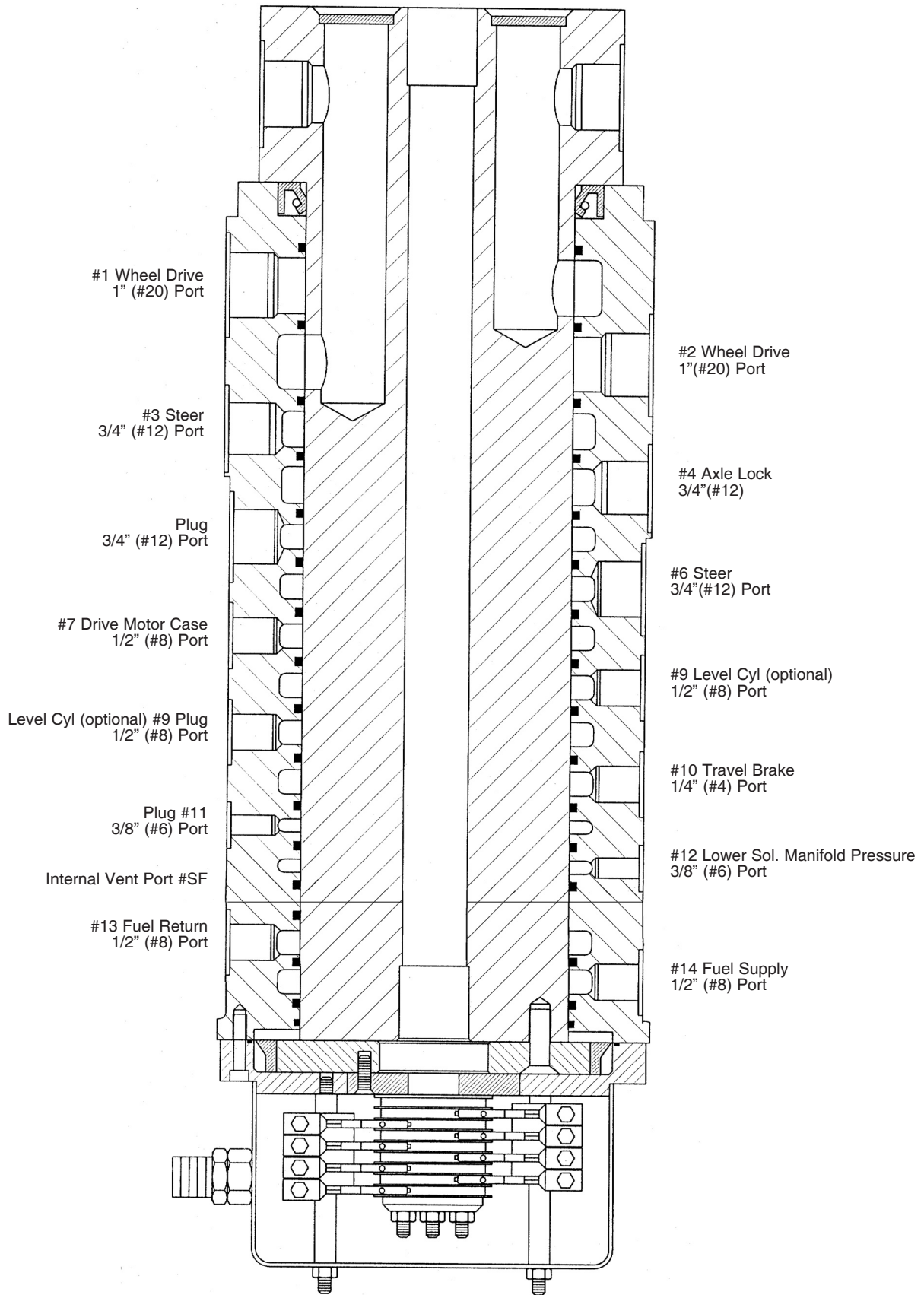
## Rotary Manifold & Swing Motor Circuit

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Figure 1: Rotary Manifold Port Locations (TF 820)



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Figure 2: Rotary Manifold Port Locations (TB 620)

# Rotary Manifold

(See Figures 1 & 2)

## General

The rotary manifold is a rotating joint which allows hydraulic oil transfer between the rotating upper turntable and the stationary frame on a continuous basis. This allows the machine to have 360° continuous rotation swing capabilities.

## Description

The rotary manifold consists of a ported barrel assembly and a cylinder spool machined with channels that are cross-drilled to ports bored into its center. When the cylinder spool is installed into the barrel assembly the channels line up with mating ports in the barrel assembly. The cylinder spool is also machined to accept flat band seals and expander rings between each channel to prevent leakage between cylinder spool channels and barrel ports. An internal drain gallery is provided at the upper lip wiper seal to prevent any leakage from the first pressure channel from blowing this seal out and contaminating the system.

The cylinder spool is retained within the barrel assembly by a bolt on retainer plate at the bottom.

The machine requires several electrical circuits in the frame to operate the frame lock mechanism and optional clam bunk. In order to do this the rotary manifold is equipped with an electrical collector assembly in a sealed housing at the base of the barrel assembly. The electrical collector assembly consists of a series of insulated armature rings (attached to wires from the rotating upper) and spring loaded brushes (attached to wires from the frame area) that maintain contact with each other during rotation. There are between 12 and 22 separate connections available through the electrical collector assembly.

## Troubleshooting Rotary Manifolds

Almost all problems with a rotary manifold are the result of failed seals between the ports which will require that the manifold be removed for repair. Removing a rotary manifold is a time consuming job so be sure that the problem is in the manifold before removing it.

Troubleshooting a rotary manifold is much easier if you remember that hydraulic and electrical are two different functions in the same component. Use the following rules when troubleshooting the rotary manifold:

- 1) A problem in a rotary manifold will usually appear when the hydraulics start to warm up or are at operating temperature. When the machine is "cold" the problem seems to disappear. This is due to the seals becoming distorted or the oil viscosity thinning as the oil warms.
- 2) Rotary manifold problems are usually the result of failed seals between ports of the manifold which allows oil or a pressure signal leakage from one port to the other (high flow to low flow or high pressure to low pressure). This will cause symptoms like functions activating without control input or gain/loss of power in one function when operating another.

To identify the problem ports you must know what each port is used for. See figures 1 and 2 for port locations.

- Wheel drive troubles, check for leakage across ports 1 and 2.
- Brake circuit troubles, check for leakage across ports 11 and 12.
- Clambunk or Arch Grapple troubles, check for leakage across ports 4 and 5.
- Steering troubles, check for leakage across ports 3 and 4.
- Port 7 is a case drain and tends to isolate leakage troubles between ports 1-6 and ports 8-14.
- High flow leakage a port 6 or 8 can indicate failure of wheel drive motor seals, clam bunk valve pilot cup seals, or the top rotary manifold seal.

- 3) Short circuiting in the electrical wiper units. There are seldom problems with the electrical wiper units. Most troubles are the result of hydraulic problems. Always check hydraulic functions first.

# Swing Motor Circuit

(See Figures 4 & 5)

## General

The swing circuit is made up of a Rexroth AA2FE series fixed displacement, bi-directional, piston motor, a Lohmann GFB-72 planetary reduction gearbox with a wet multi-disc brake, an electrical/pilot operated valve section (cylinder spool) and an anti-cavitation block containing make-up valves and anti-cavitation valves.

## Swing Brake Description

The swing brake is a multi-disc and plate assembly located in the first stage planetary gear assembly. It is spring applied and hydraulically released. The brake is designed as a parking brake only and is not intended to be used as a cyclic service brake. The discs and plates are lubricated by the release signal oil.

## Swing Brake Operation

When the engine is shut off, the swing brake is engaged by spring pressure on the brake pack. When the operator starts the engine, a 400 PSI (2,8 Mpa) pressure signal from the wheel drive charge pressure manifold/filter assembly is sent to the brake pack. This pressure signal enters the brake housing and releases the brake by forcing the piston to compress the brake spring. The plates and discs are now free to float.

The swing brake is disengaged whenever the engine is running. The swing brake is only applied when the engine is shut off.

## Swing Motor Description

The swing motor assembly consists of the Rexroth hydraulic motor mated to the Lohmann planetary gearbox. The motor rotating group is splined to the motor output shaft which mates to a pinion shaft in the reduction gearbox. The gearbox pinion engages the swing bearing gear.

The electronic ramp control in the control box, will control the rate that the swing section spool opens or closes. This helps to provide smooth acceleration and braking for the swing circuit (for information on how to adjust the swing controls please read the IQAN Training Manual). The braking of the swing

should be adjusted to allow the upper structure to come to a stop in 45-90° from the time the control handle is released. The electronic controller also sets the swing speed. This can be adjusted up to 8.5 RPM (depending on wood size).

## Swing Motor Operation

When the operator activates the swing control in the desired direction, an electrical signal is sent from the hand control to the control box. The control box modulates the signal and then sends it down to the swing section on the control valve.

The anti-cavitation block and maintaining a system backpressure of at least 150 PSI keeps the swing motor from cavitating.

The swing motor anti-cavitation block also has a port cross drilled into each of the ports. A line is hooked to each of these ports and runs to the mono-block where it is attached to the swing detent solenoid. For more information on how the swing detent works, see the swing detent circuit.

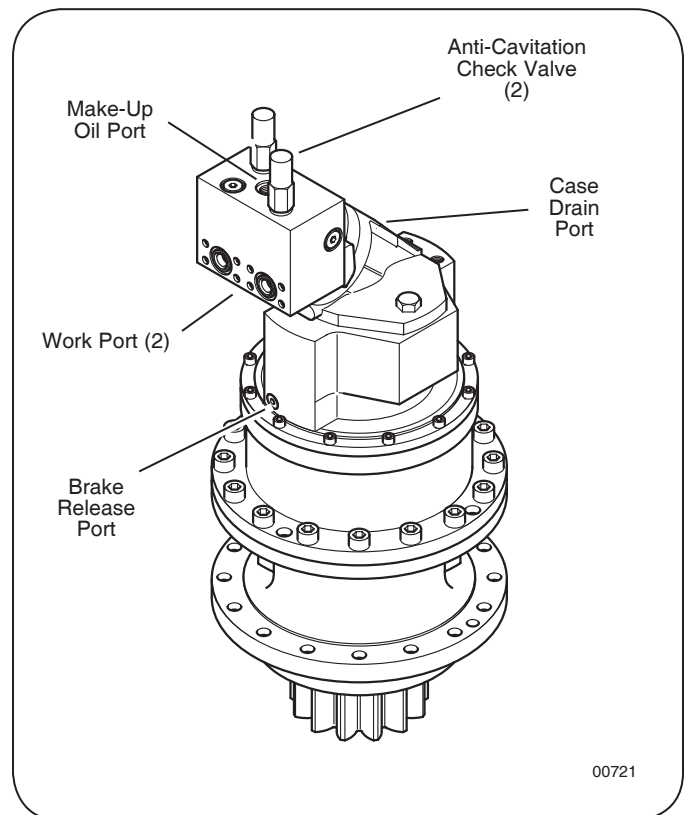
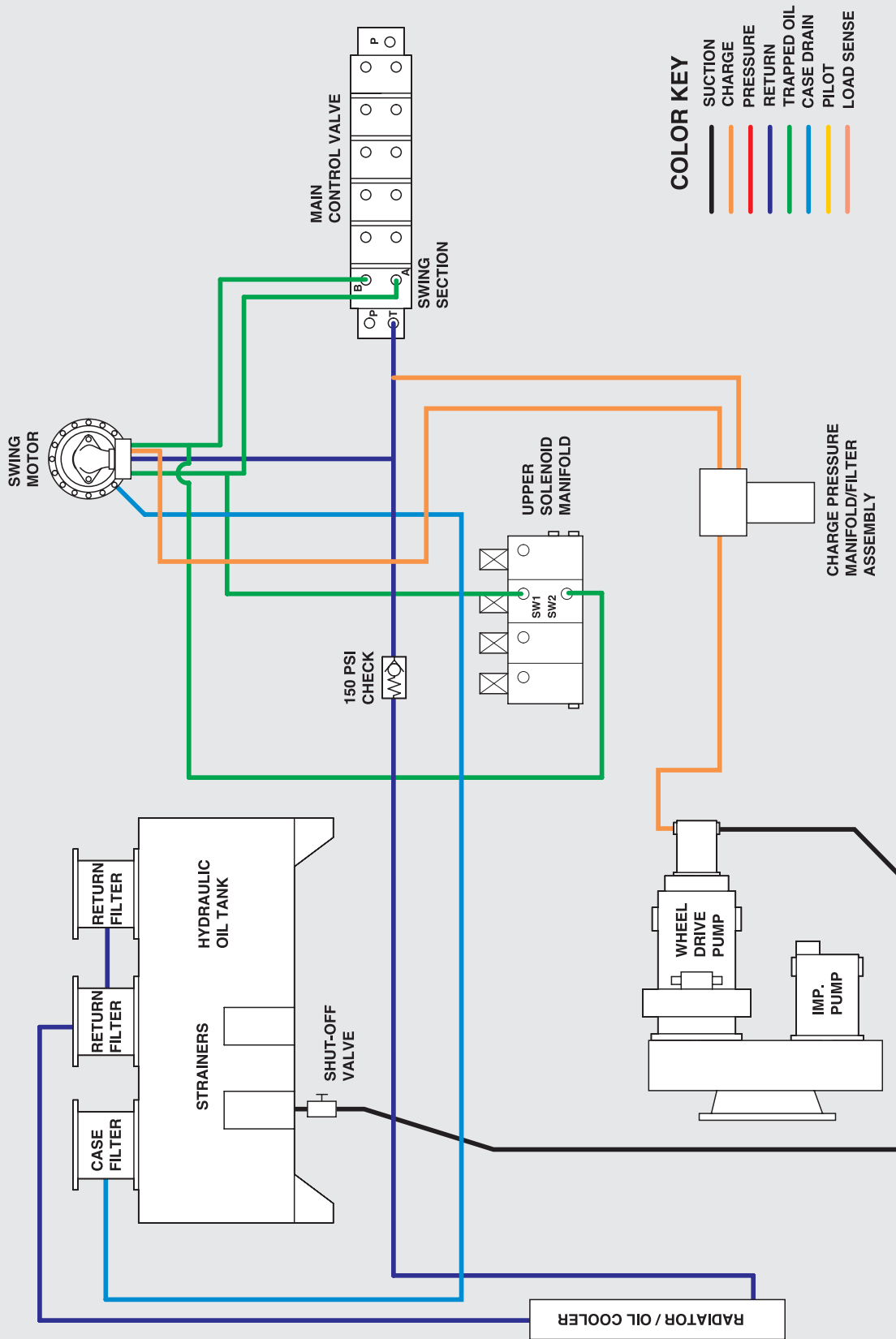


Figure 3: Lohmann Swing Motor Ports



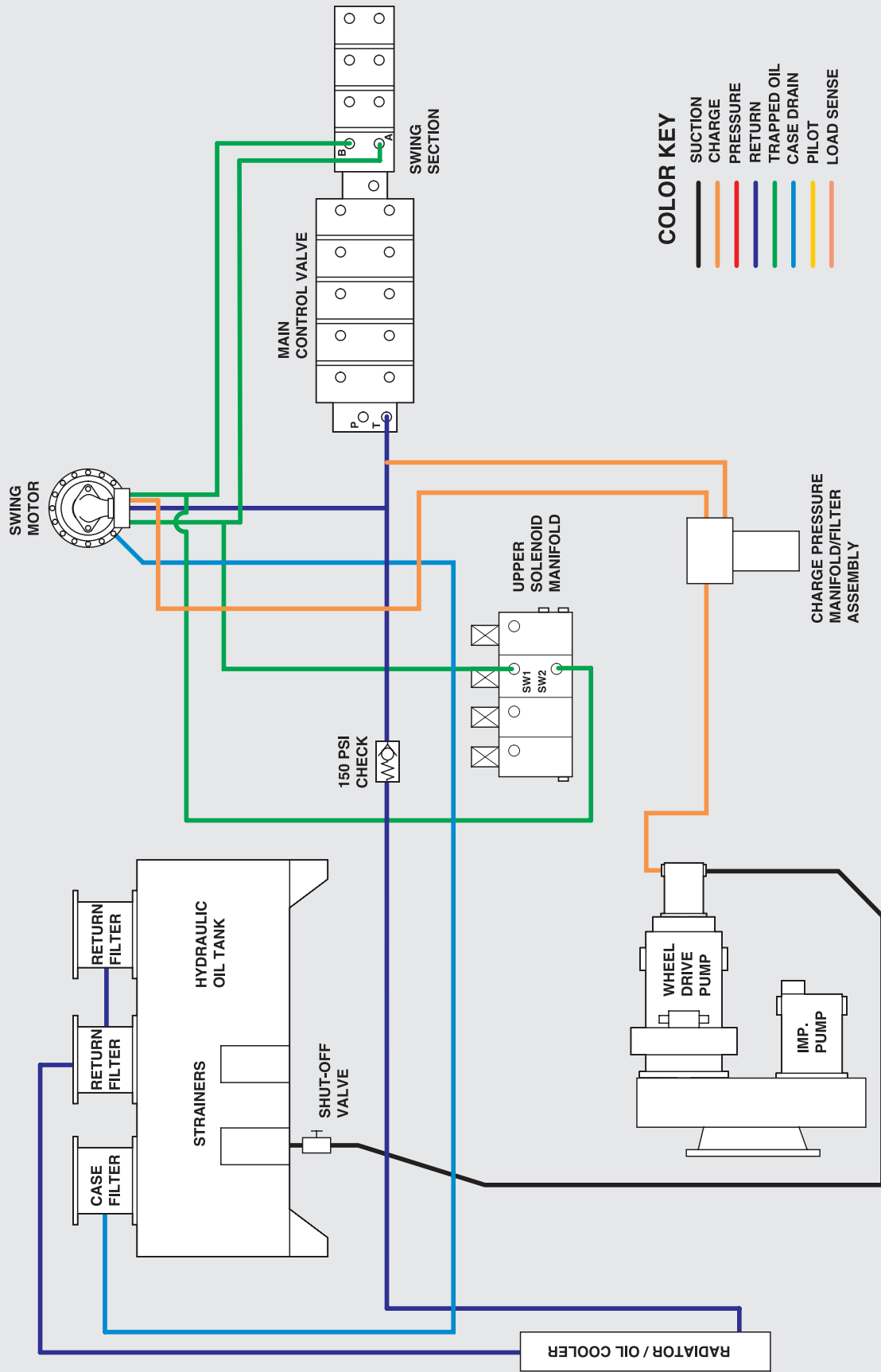
**COLOR KEY**

Black line	SUCTION
Orange line	CHARGE
Red line	PRESSURE
Blue line	RETURN
Green line	TRAPPED OIL
Yellow line	CASE DRAIN
Light blue line	PILOT
Light green line	LOAD SENSE

## TF800 SWING MOTOR CIRCUIT DIAGRAM

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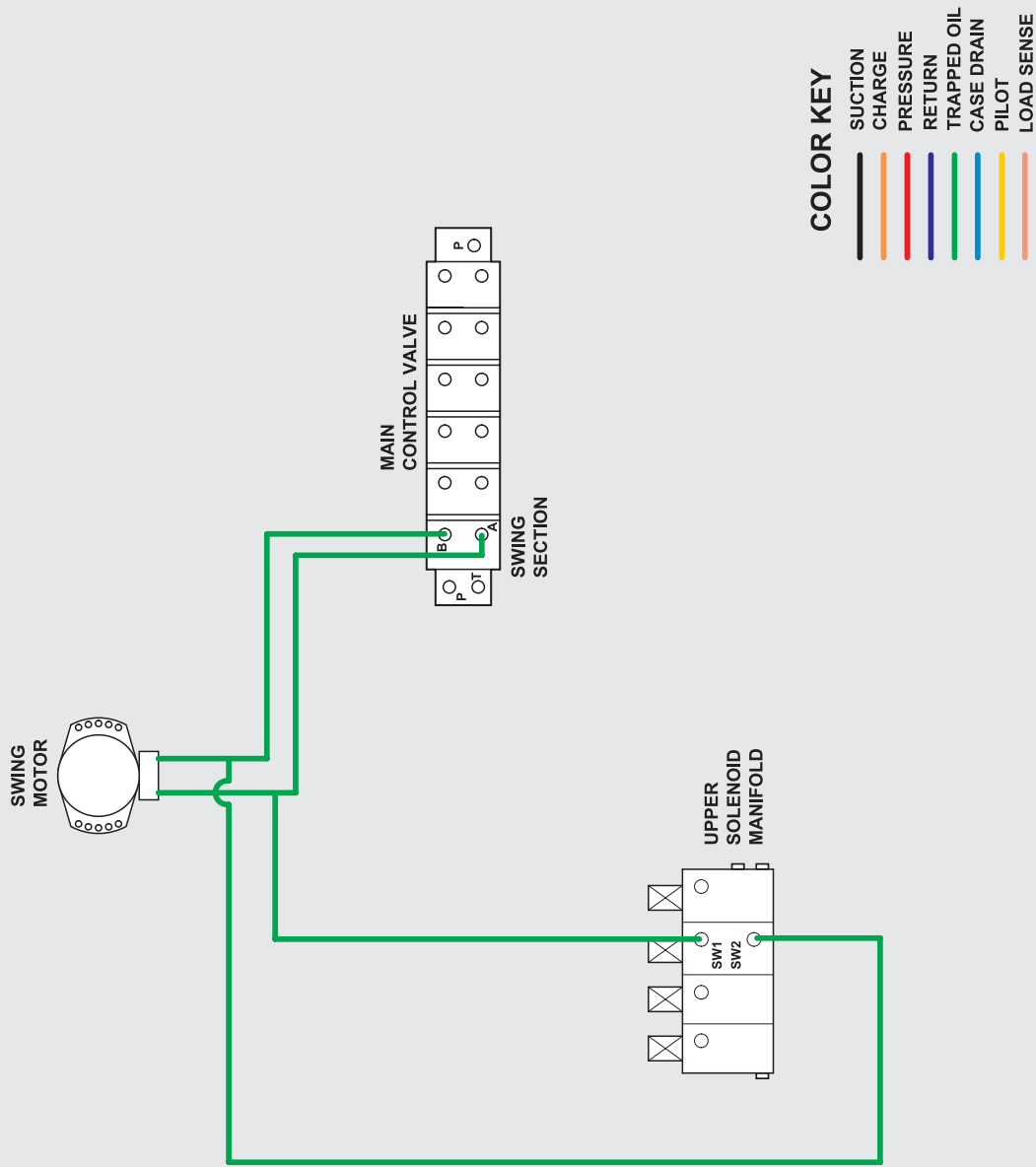
Figure 4: Simplified Swing Motor Circuit - TF800



## TB800 SWING MOTOR CIRCUIT DIAGRAM

T0824

Figure 5: Simplified Swing Motor Circuit - TB800 & TB600



# SWING DETENT CIRCUIT DIAGRAM

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Figure 6: Simplified Swing Detent Circuit (Typical)

# Swing Detent & Reverse Steer Circuits

## Swing Detent (See Figure 6)

The swing detent feature allows the upper turntable to swing automatically with the rear frame (with the bucket clamped to the rear frame) when traveling in reverse. This allows the operator to concentrate on steering the machine without having to also swing the upper turntable and booms to clear obstacles. The swing detent “ON/OFF” control switch is located just forward of the throttle control in the dash panel. See Figure 7.

There is a pilot line connecting each work port of the swing motor to the upper solenoid manifold port SW1 or SW2. Between ports SW1 and SW2 is a normally closed solenoid valve (SV2).

During normal operation, SV2 blocks movement of oil between the swing motor work ports. When the swing detent switch is moved to the ON position, solenoid SV2 is energized and oil is allowed to pass freely between the swing motor work ports in a closed loop. This allows the motor to “float” in a dampened state while the bucket is clamped to the turning frame.

## Reverse Steer

### **WARNING**

When “Reverse Steer Feature” is activated, steering control will be crossed when traveling in the normal forward direction.

The reverse steer feature is designed to be used when traveling in reverse (operator facing the log bunk or clam bunk). The reverse steer “ON/OFF” control switch is located just forward of the throttle control in the dash panel. See Figure 7.



Figure 7: Reverse Steer Feature Control

Normally the steering controls are crossed when operating in reverse. Activating the reverse steer feature un-crosses the steering controls, allowing the operator to steer the machine as he would if traveling forward. This allows the operator to steer the machine in the desired direction without having to think about which way to move the control handle. This is done by crossing the electrical wires between the control handle and control box using a 2-position, 4-way switch.

Always be sure to de-activate the reverse steer feature when returning to forward travel.

