CARGOTEC

Hydrostatic Testing Work Sheet

Customer	Store #	Service Partner/Branch
Address		Address
City / ST / Zip		City / ST / Zip

Date / /	Model (Type)	Serial #	HRS	Oil Type/Weight/Sample Taken:

Hydrostatic Components Replaced? Date/HRS

Date/Hrs of Last Suction Filter Replacement	Date/Hrs of Last Hydraulic Oil Replacement

Symptom (complete):

With the Hydrostatic Pump separated from Differential Lock Block (see page 2&3):

	Idle		Wide Open Throttle	
Charge Pressure				
Pedal Supply Pressure (PS) (if Applicable)				
See pages 4-8 for test port location	*Forward*	*Reverse*	*Forward*	*Reverse*
Pedal Pressure (if applicable)				
Servo Control Pressure				
Main Pump Pressure				

Will the pump stall the engine from full throttle with the travel pedal depressed no more than about half way? Y / N ☐☐

With the Hydrostatic Pump reconnected to the Differential Lock Block: (See pages 9-12)

	Case Drain Leakage (1 qt in 30 seconds max)	**Cross-Port Leakage** (.25 qt in 30 seconds max)
Left Hand Wheel Motor		
Right Hand Wheel Motor		
Rear Wheel Motor		

Disassembly of Wheel Motors Required to Find Problem? Comments:

Diagnosis:

Authorized Signature:	**Technician:**

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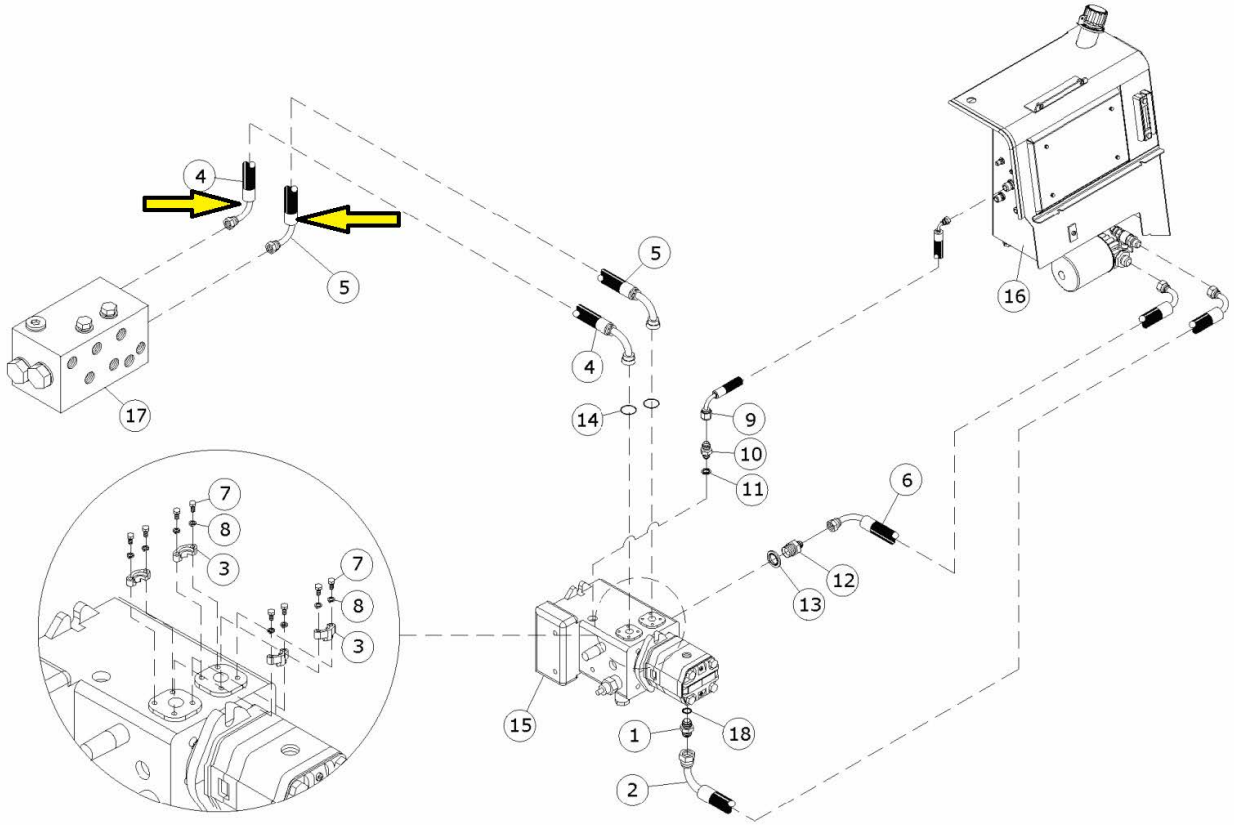
Model:M55
Chapter 4.7 08. Hydraulic Components For Pump

M8D080
Hydraulic Components For Rexroth Pump

M8D080 - Hydraulic Components For Rexroth Pump

When testing pump pressures disconnect hose number 4 & 5. Plug the hose and cap the fitting.



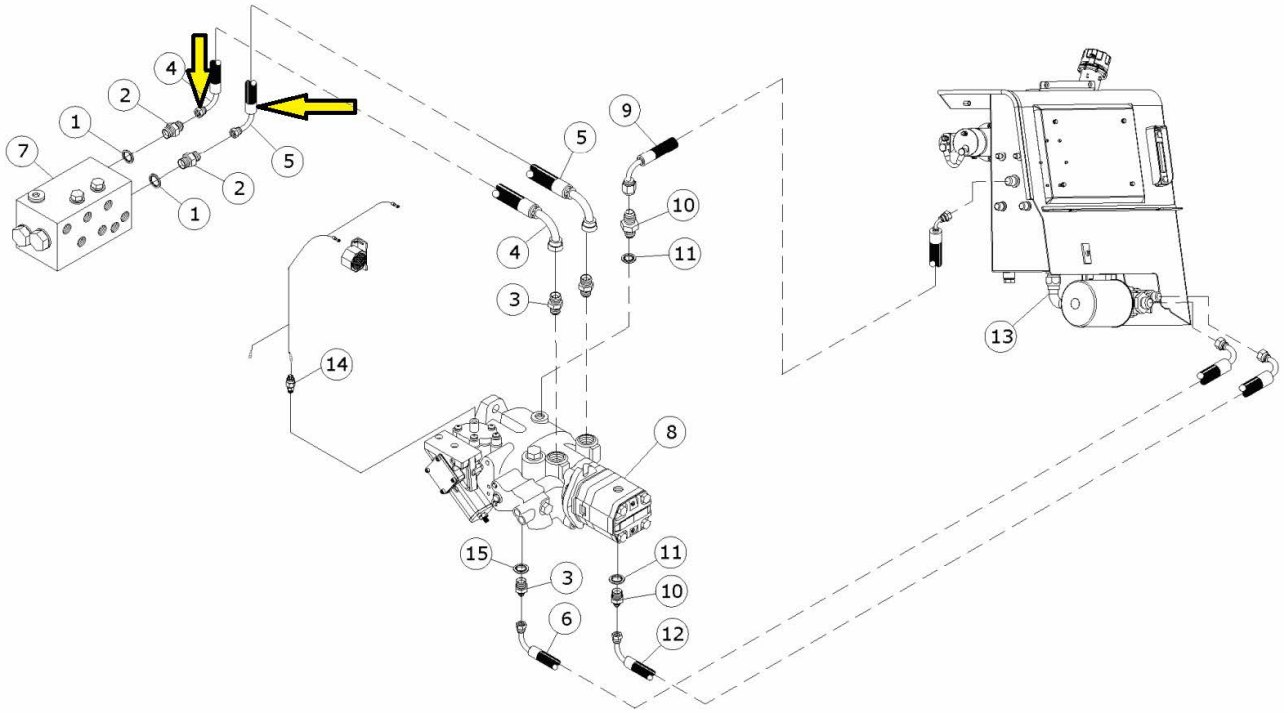
Pos	Part No	Description	Quantity
1	250528	1 1/16 x 1 1/16 JIC Adaptor	1
2	518.100.0029	Hose	1
3	530.050.0010	1 1/4? Clamp	2
4	518.100.0074	Hose	1
5	518.100.0170	Hose	1
6	518.100.0076	Hose	1
7	503.055.0102	M10x35 Bolt	8
8	503.999.0017	M10 Spring Washer	8
9	518.100.0092	Hose	1
10	530.055.0070	1&1/16 JIC MM x M22 adaptor	1
11	519.055.0012	M22 Bond Seal	1
12	530.055.0069	M33x1 5/16 M/M Adaptor	1
13	519.055.0034	M33 Bond Seal	1
14	519.055.0040	30mm O-ring	2
15	See Section D.	Rexroth Pump	1
16	See Section A.	Hydraulic Tank	1
17	See Section D.	Diff Block	1
18	519.055.0073	1 1/16 O-Ring	1

Model:M55
Chapter 4.7 08. Hydraulic Components For Pump

M8D081
Hydraulic Components For Sauer Pump

M8D081 - Hydraulic Components For Sauer Pump

When testing pump pressures disconnect hose number 4 & 5. Plug the hose and cap the fitting.



Pos	Part No	Description	Quantity
1	519.055.0065	3/4" Bond Seal	2
2	250420	3/4" M/M Adaptor	1
3	250538	15/16x11/16" M/M Adaptor	3
4	518.100.0021	Hose	1
5	518.100.0022	Hose	1
6	518.100.0029	Hose	1
7	See Section D.	Diff Block	1
8	See Section D.	Sauer Pump	1
9	518.100.0092	Hose	1
10	250528	11/16 x 11/16" M/M Adaptor	2
11	252120	O-Ring 1 1/16" JIC	1
12	518.100.0028	Hose	1
13	See Section A.	Hydraulic Tank	1
14	500.999.0103	Pressure Switch	1
15	519.055.0069	1 1/4" Bond Seal	2

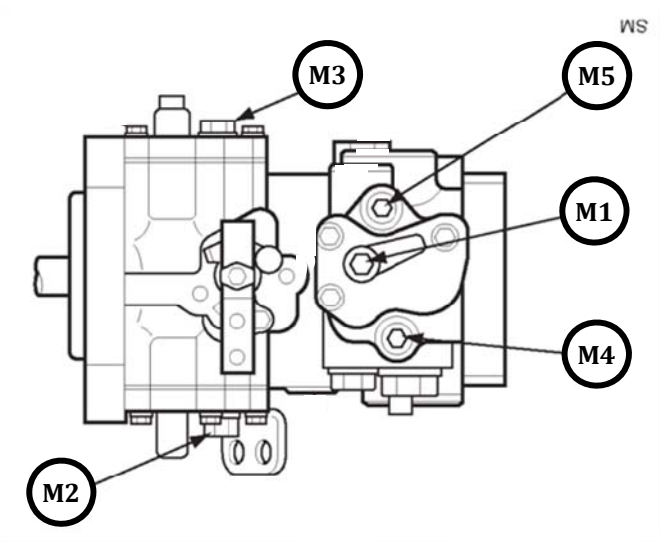
Sauer M46 Hydrostatic Pump

Cable control (M46-20419)

Hydraulic control (M46-20726)

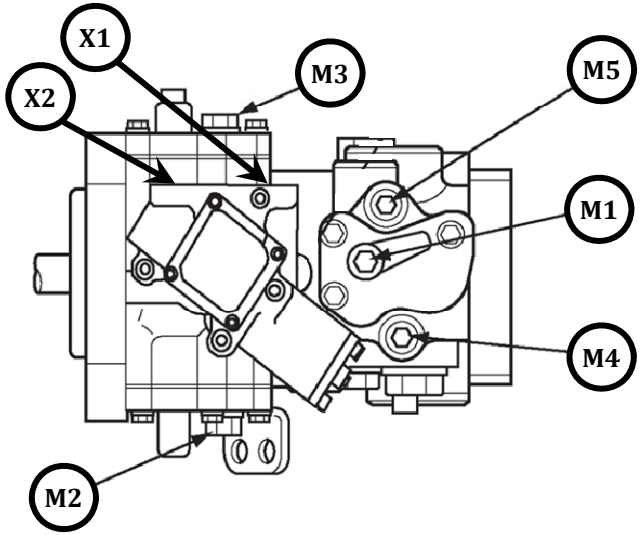
Sauer Hydrostatic Pump – Test Ports

MDC



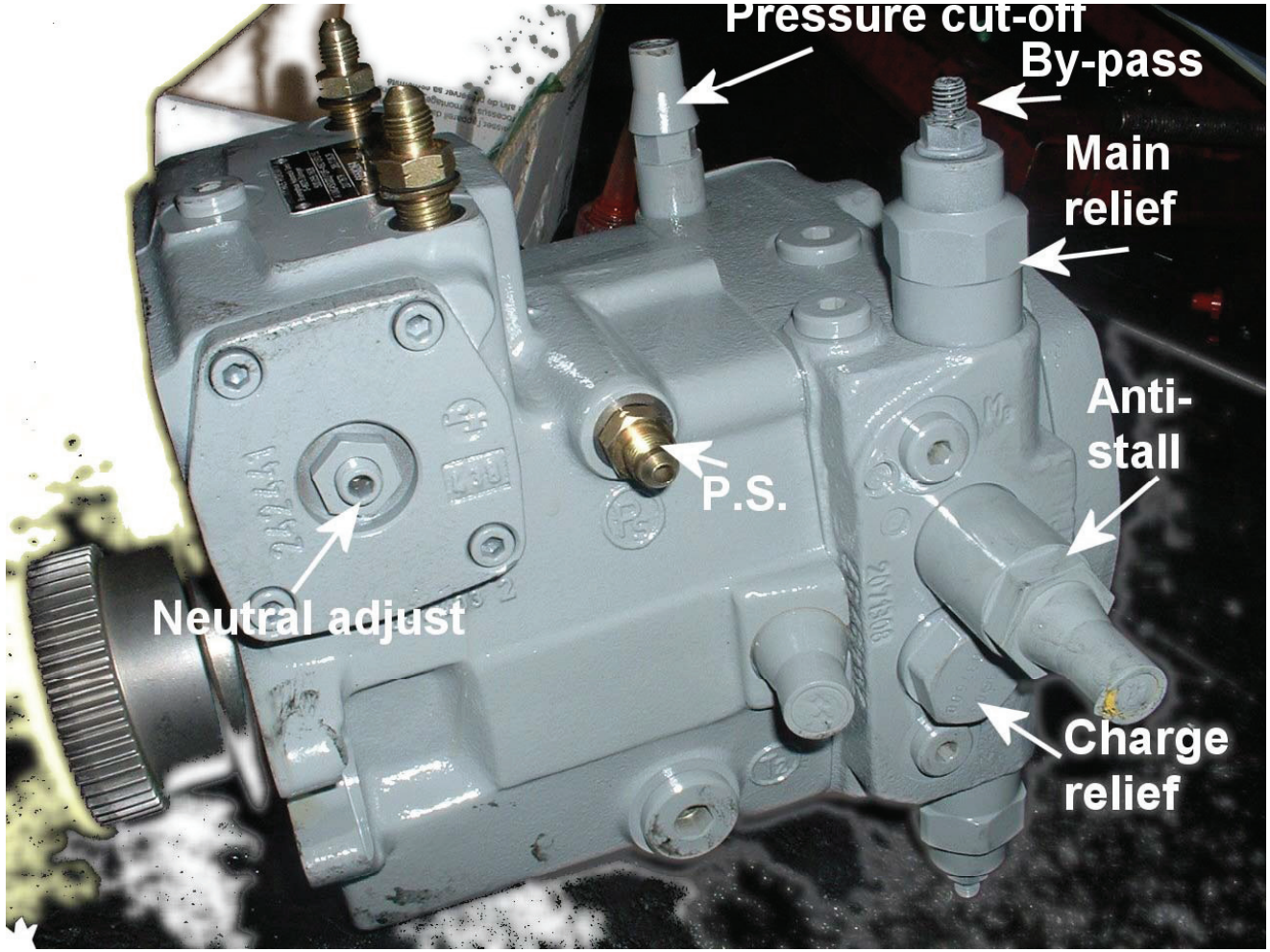
Port	Circuit	Minimum Pressure Gauge Required (psi)
M1	Charge	500
M2	Servo – Forward	500
M3	Servo – Reverse	500
M4	Main – Forward	6000
M5	Main - Reverse	6000

HDC



Port	Circuit	Minimum Pressure Gauge Required (psi)
M1	Charge	500
M2	Servo – Forward	500
M3	Servo – Reverse	500
M4	Main – Forward	6000
M5	Main - Reverse	6000
X1	Pedal – Forward	500
X2	Pedal – Reverse	500

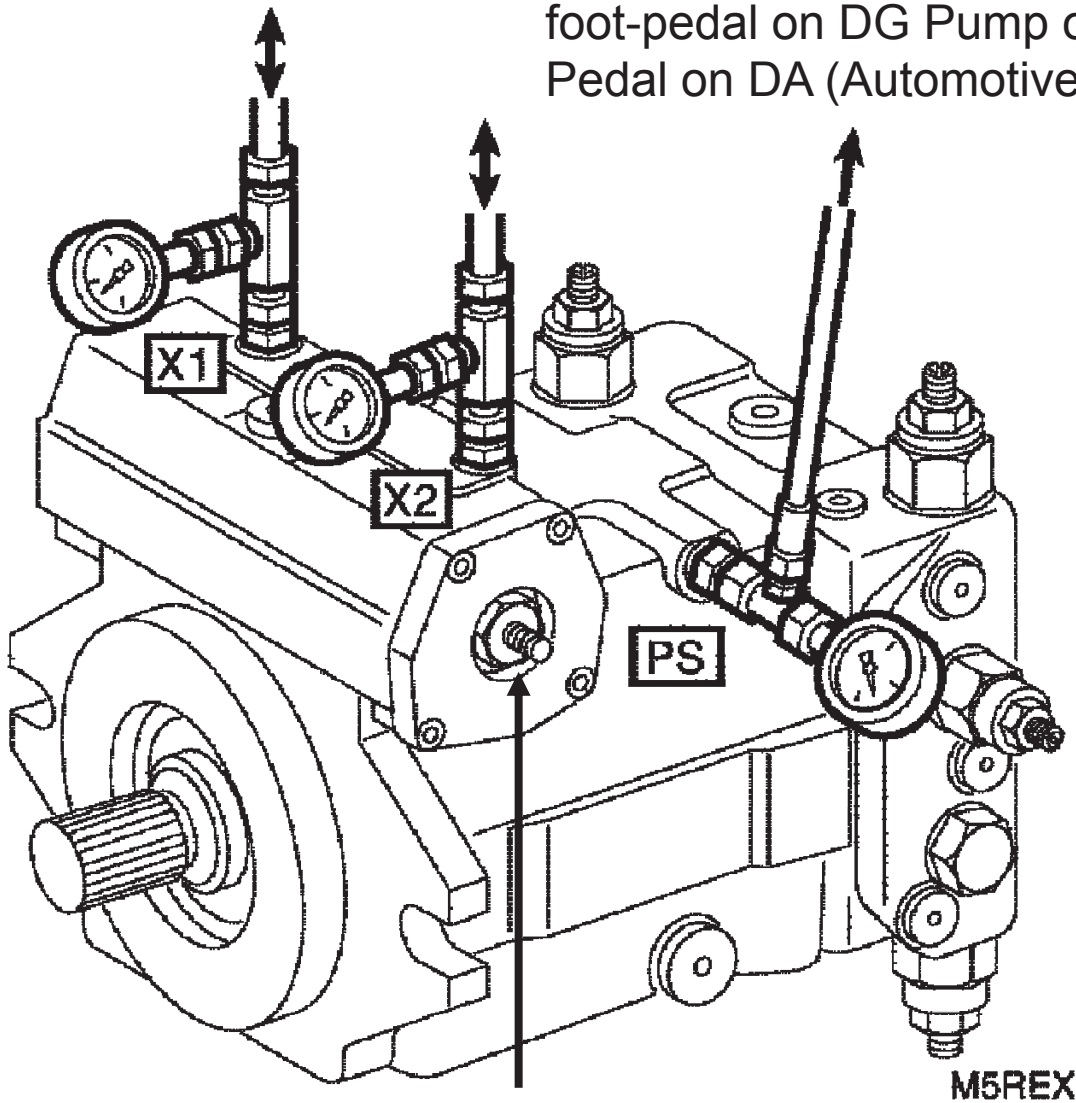
Rexroth Hydrostatic Pump



Rexroth Hydrostatic Pump

P.S. Port (Pedal Supply). Supplies foot-pedal on DG Pump or Inching Pedal on DA (Automotive) pump.

Servo Pressure ports, X1 & X2



"D.A." Anti-Stall Valve

Neutral Setting

SM

M5REXPT-06

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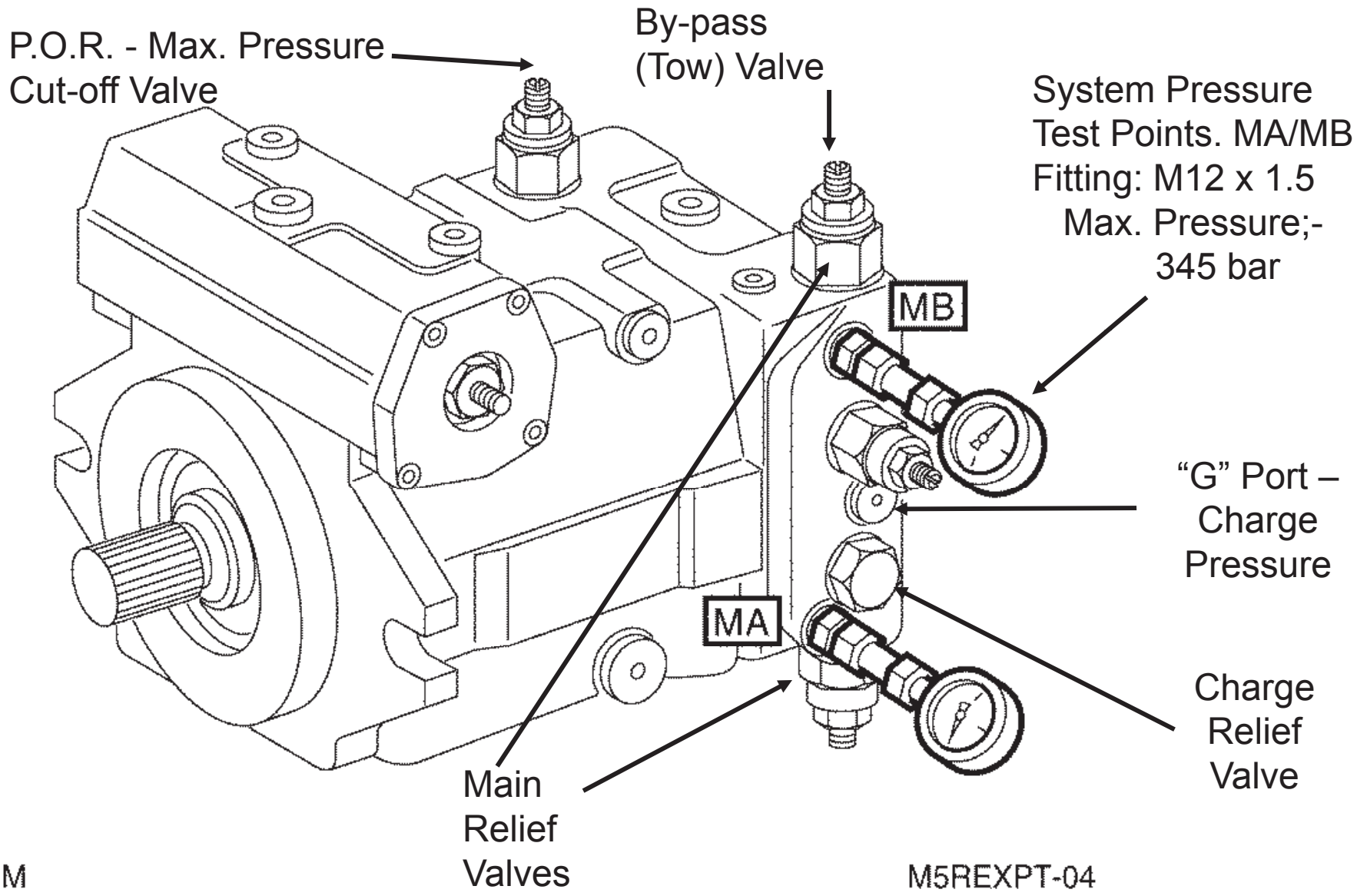
Rexroth Hydrostatic Pump



SM

M5REXPT-04

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HYDROSTATIC TRANSMISSION - TESTING & FAULT FINDING

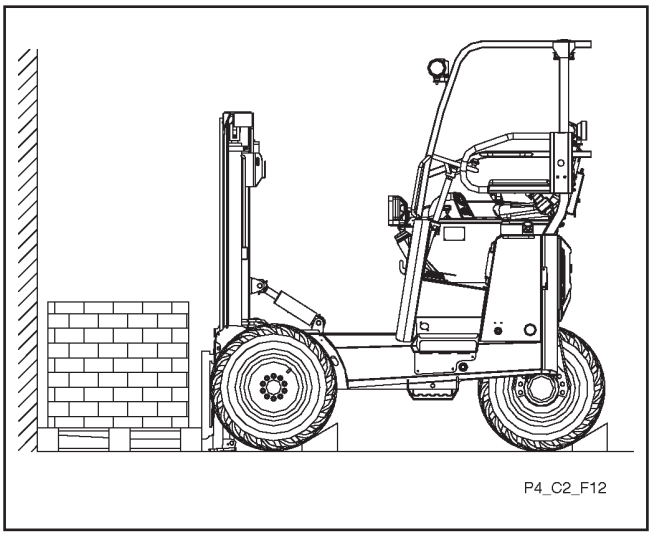

FIGURE 14. FORKLIFT POSITIONED FOR COMPONENT LEAKAGE TEST

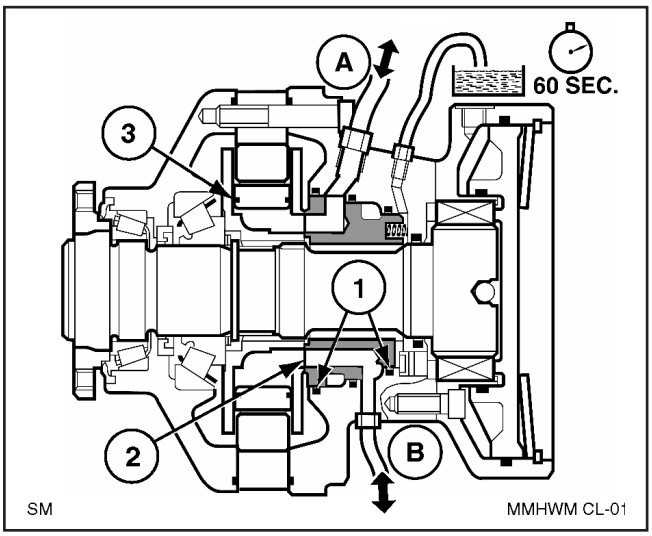

FIGURE 15. INTERNAL LUBRICATION LEAKAGE

1. *Distributor Outer Seals*
2. *Distributor Cylinder Block Interface*
3. *Pistons and Seals*

By design, internal leakage within the wheel motor provides lubrication and cooling of the moving parts. As wear takes place in operation, internal leakage increases.

The amount of wear can be indicated by checking leakage under loaded conditions.

HYDROSTATIC WHEEL MOTOR LEAKAGE

- Wheel motor leakage is measured from each motor in turn while the hydrostatic circuit is fully loaded in forward travel for a period of 60 seconds.
- Back leakage from the lubrication port and cross port leakage between the two high pressure ports can be check as shown in figures 16 and 18.
- Measured leakage should not exceed the amount specified in 60 seconds, leakage in excess indicates component wear and the wheel motor will require replacement or overhaul.

HYDROSTATIC PUMP LEAKAGE

- The condition of the hydrostatic piston pump is indicated by the hydrostatic transmission circuit and high pressure relief valve tests, reference pages 11 and 12.

WHEEL MOTOR LUBRICATION LEAKAGE TEST

Each wheel motor can be tested for internal leakage returning from the motor lubrication return port with the transmission loaded.

- Check oil level and top up if required, operate the forklift to warm the hydraulic oil to 50 - 60^0 C.
- Pick up a load on the forks approximately equal to the rated capacity of the unit and position the unit against an obstruction. Chock the rear of each wheel, this will provide transmission stall and produce maximum pressure during the test.
- Stop the engine, disconnect the lubrication return hose from one of the wheel motors and fit a steel plug to the disconnected hose. Install a drain hose to the motor port to allow the leakage to be directed into a measured container.
- From the operators seat release the park brake, start and run the engine at maximum rpm. Then slightly depress the travel pedal in forward travel to produce transmission pressure of 280 - 300 bar / 4000 - 4290 lbf/in^2 and hold for 60 seconds. The leakage should not exceed 1.5 - 2.0 litres in 60 seconds. Carry out the same test in reverse travel.
- Repeat the above test on the other wheel motors.
- Leakage in excess of the specified amount indicates wear of the hydrostatic cylinder and distributor assembly requiring wheel motor replacement or overhaul.

HYDROSTATIC TRANSMISSION - TESTING & FAULT FINDING

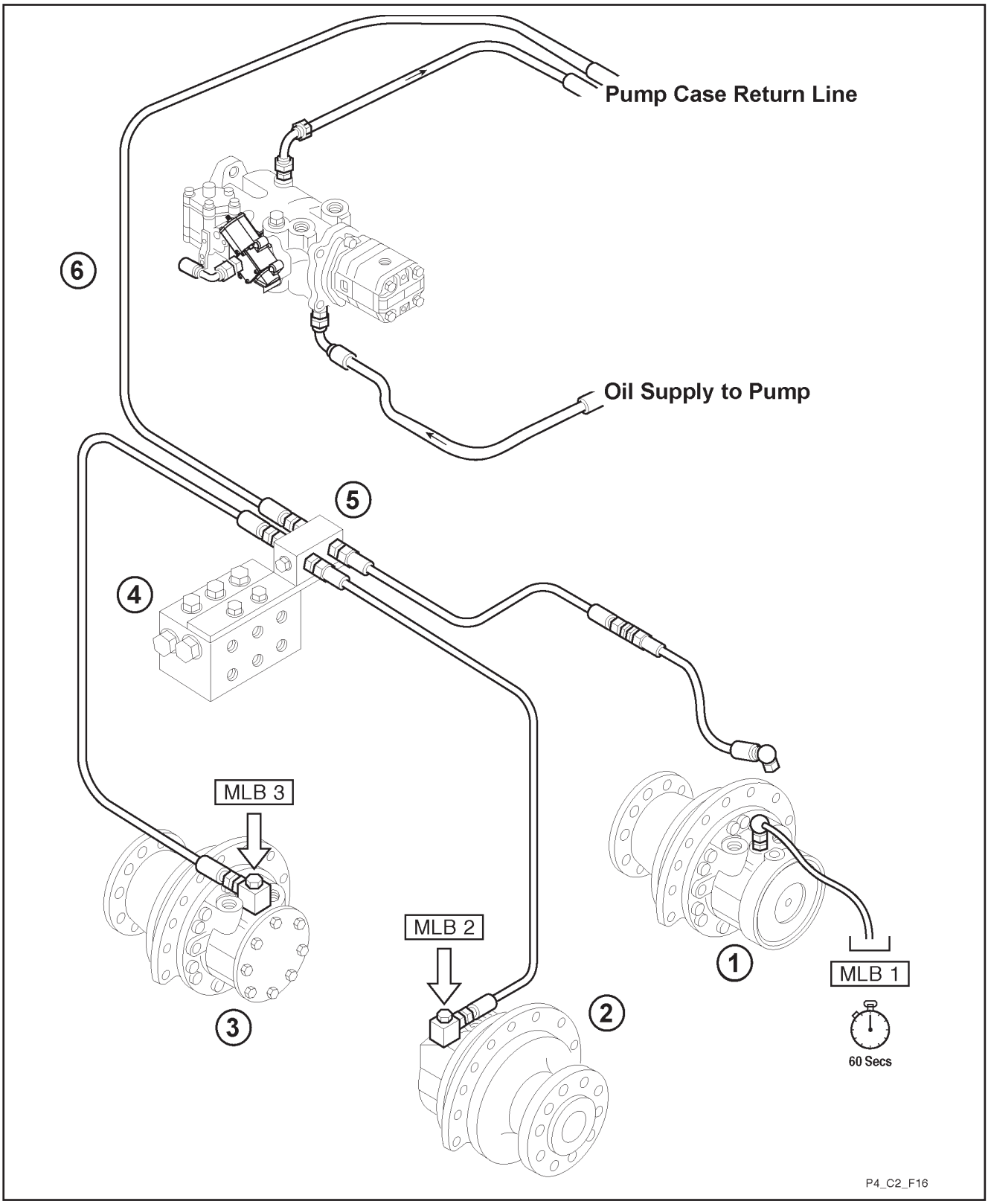

FIGURE 16. HYDROSTATIC WHEEL MOTOR LUBRICATION LEAKAGE TEST

MLB 1. Rear Motor Leakage
MLB 2. Front Left Hand Motor Leakage
MLB 3. Front Right Hand Motor Leakage

1. Rear Wheel Motor
2. Front Left Hand Wheel Motor
3. Front Right Hand Wheel Motor
4. Differential Lock Valve
5. Manifold
6. Hydrostatic Pump

HYDROSTATIC TRANSMISSION - TESTING & FAULT FINDING

WHEEL MOTOR CROSS PORT LEAKAGE TEST

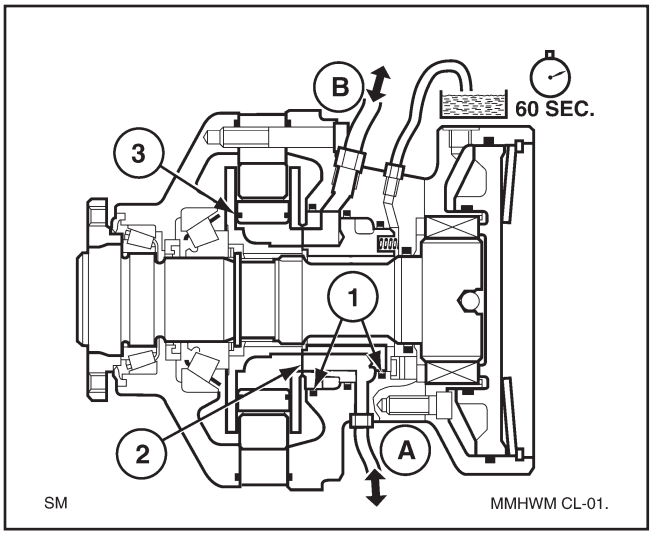

FIGURE 17. INTERNAL CROSS PORT LEAKAGE

1. Distributor Seals

Cross port leakage provides an indication of distributor seal wear, in particular the centre seal.

Note! *Wheel motor hydrostatic circuit ports are identified with the letters 'R' and 'L', Reverse and forward travel hoses, 'A' and 'B', are connected as indicated below.*

Wheel Motor	*Hose "A"*	*Hose 'B'*
Rear and Front R.H.	*Port "R"*	*Port "L"*
Front Left hand	*Port "L"*	*Port "R"*

Each wheel motor can be tested for cross port leakage with the transmission loaded.

- Check oil level and top up if required, operate the forklift to warm the hydraulic oil to 50 - 60^{o} C.
- Pick up a load on the forks approximately equal to the rated capacity of the unit and position the unit against an obstruction. Chock the both sides of each wheel, this will provide transmission stall and produce maximum pressure during the test.
- Stop the engine, install 400 bar pressure gauges into the reverse and forward pressure ports on the hydrostatic pump, observe the gauges to check transmission pressure during the tests.
- Reference MCL 1, figure 18, disconnect the "A" hose from the wheel motor port and fit a steel plug to the disconnected hose. Install a drain hose into the motor port to allow the leakage to be directed into a measured container.
- From the operators seat release the park brake, start and run the engine at maximum rpm. Slightly depress the travel pedal in reverse travel to produce transmission pressure of 280 - 300 bar / 4000 - 4290 lbf/in^2 and hold for 60 seconds. The leakage should not exceed 0.5 litres in 60 seconds.
- Repeat the above test on the other wheel motors.
- Ideally the leakage test should also be done on each motor in forward travel. The "B" hose should be disconnected from the motor and plugged and the leakage measured from the motor port, reference MCL 2, figure 18.
- Leakage in excess of the specified amount indicates leakage across the distributor seal requiring wheel motor replacement or overhaul.

HYDROSTATIC TRANSMISSION - TESTING & FAULT FINDING

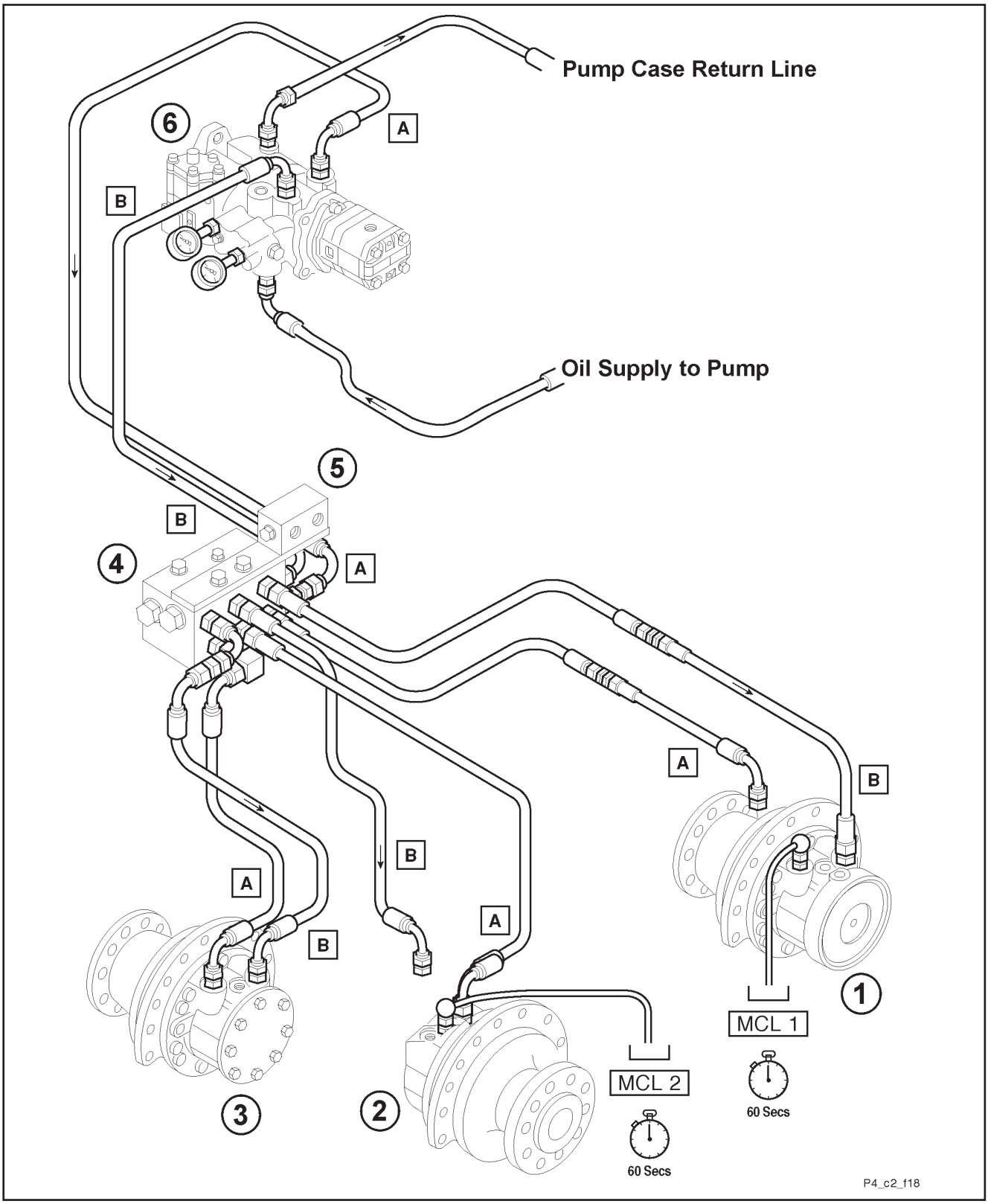

FIGURE 18. HYDROSTATIC WHEEL MOTOR CROSS PORT LEAKAGE TEST

MCL 1. Rear Motor Cross Port Leakage: Reverse Travel Leakage Shown
MCL 2. Front Left Hand Motor Cross Port Leakage: Forward Travel Leakage Shown

1. *Rear Wheel Motor*
2. *Front Left Hand Wheel Motor*
3. *Front Right Hand Wheel Motor*
4. *Differential Lock Valve*
5. *Manifold*
6. *Hydrostatic Pump*