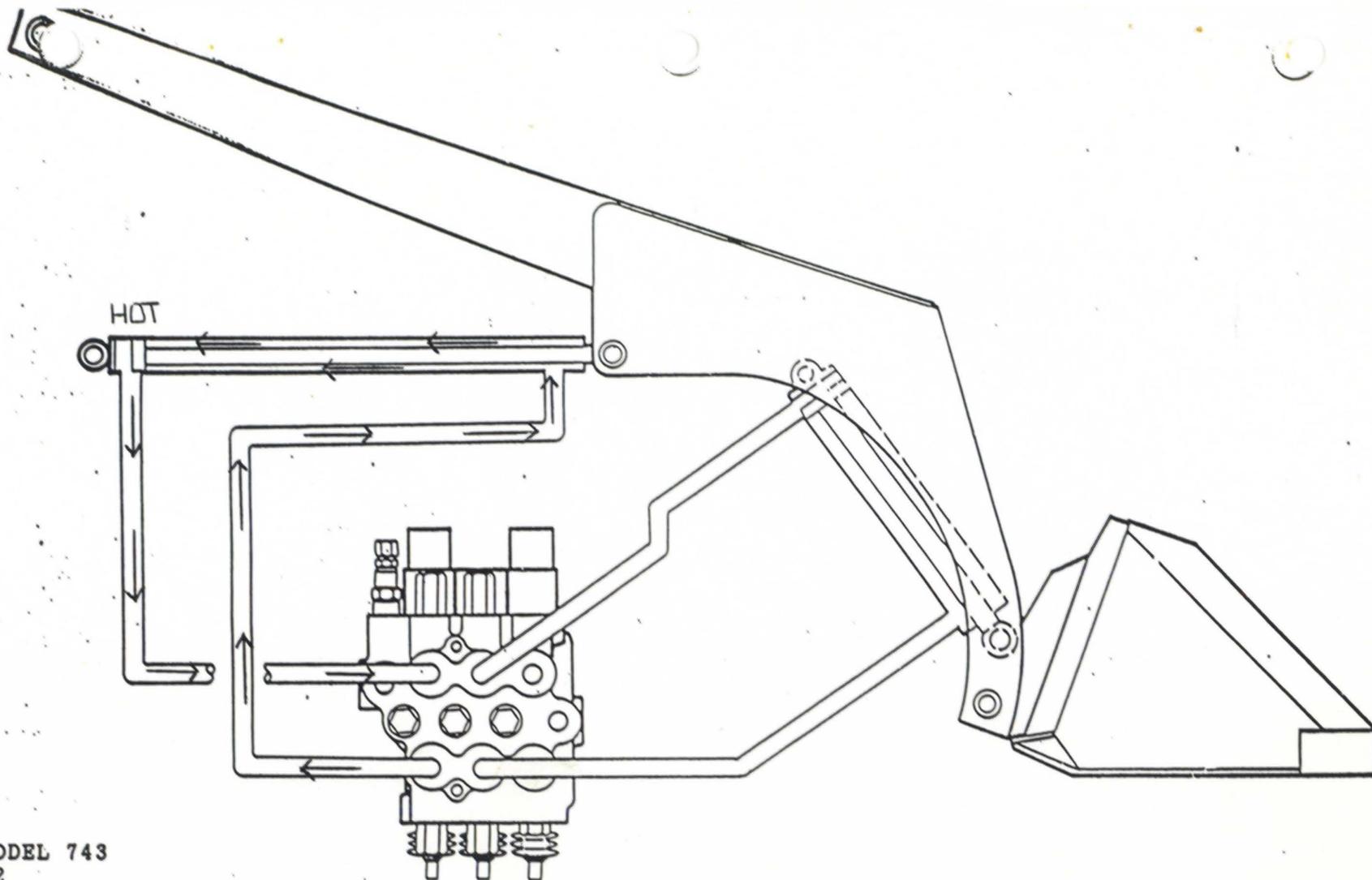


MODEL 743  
#1

LIFT CYLINDER TEST: TO DETERMINE IF THE PISTON SEALS ON THE LIFT CYLINDER ARE DAMAGED, FOLLOW THIS PROCEDURE.

1> LOWER THE BOOM FULLY. 2> CONTINUE HOLDING THE LIFT PEDAL IN THE TOE DOWN POSITION PRESSURIZING THE ROD END OF THE LIFT CYLINDER. THIS WILL FORCE THE MAIN RELIEF VALVE TO OPEN AT 2200 PSI. 3> DEPRESS THE HEEL OF THE TILT CYLINDER. IF THE BUCKET ROLLS BACK, OIL IS COMING ACROSS THE SEALS IN THE LIFT CYLINDERS. THE OIL LEAKING PAST THE SEALS IN THE LIFT CYLINDERS FEEDS BACK TO THE REAR PORT OF THE LIFT VALVE SECTION THUS SUPPLYING OIL TO THE TILT CIRCUIT. POSITION THE LIFT PEDAL IN THE TOE DOWN POSITION AND TILT PEDAL IN THE HEEL DOWN POSITION. WITH GOOD SEALS IN THE LIFT CYLINDER, THERE WILL BE NO OIL RETURNING TO THE POWER PORT OF THE VALVE. THE ANTI-CAVITATION VALVE IN THE TILT SECTION WILL NORMALLY FEED THE BASE END OF THE TILT CYLINDER AND THE BUCKET WILL ROLL OUT. THIS IS NORMAL.

NOTE: OIL LEAKAGE FROM EITHER LIFT OR TILT CAN BE CONFIRMED BY ATTACHING A LINE FROM AUXILIARY QUICK COUPLERS AND ENGAGING AUXILIARY LEVER. THIS WILL ALLOW VISUAL INSPECTION OF LEAKAGE.

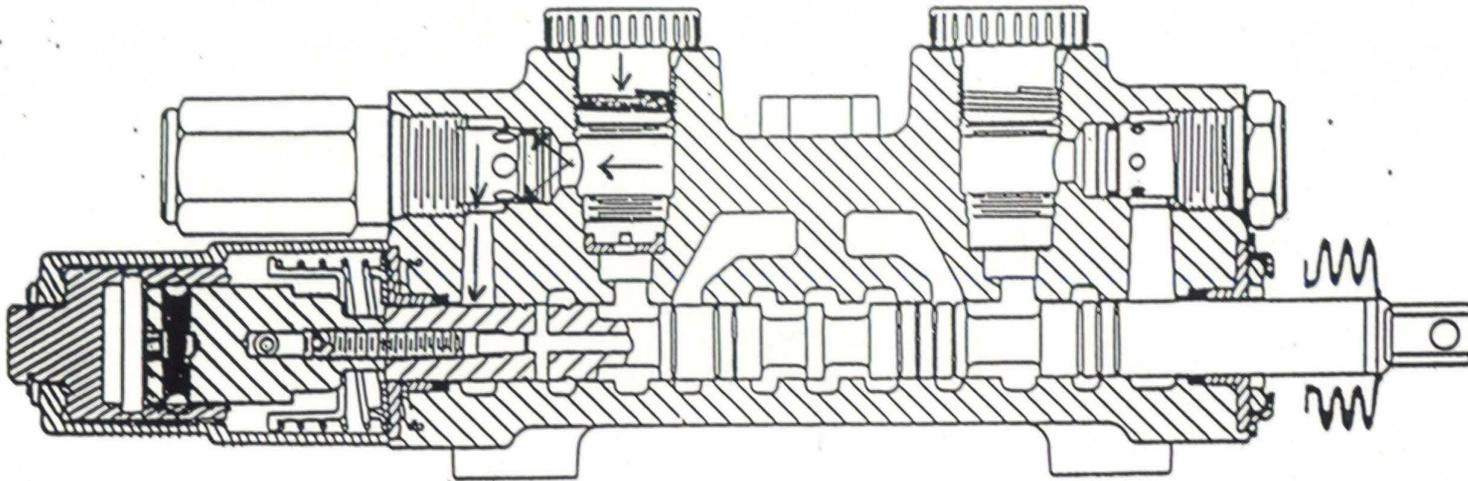


MODEL 743

#2

**TESTING THE LIFT CYLINDERS FOR INTERNAL LEAKAGE:** TO DETERMINE WHICH PISTON SEAL IS DAMAGED, FOLLOW THIS PROCEDURE.

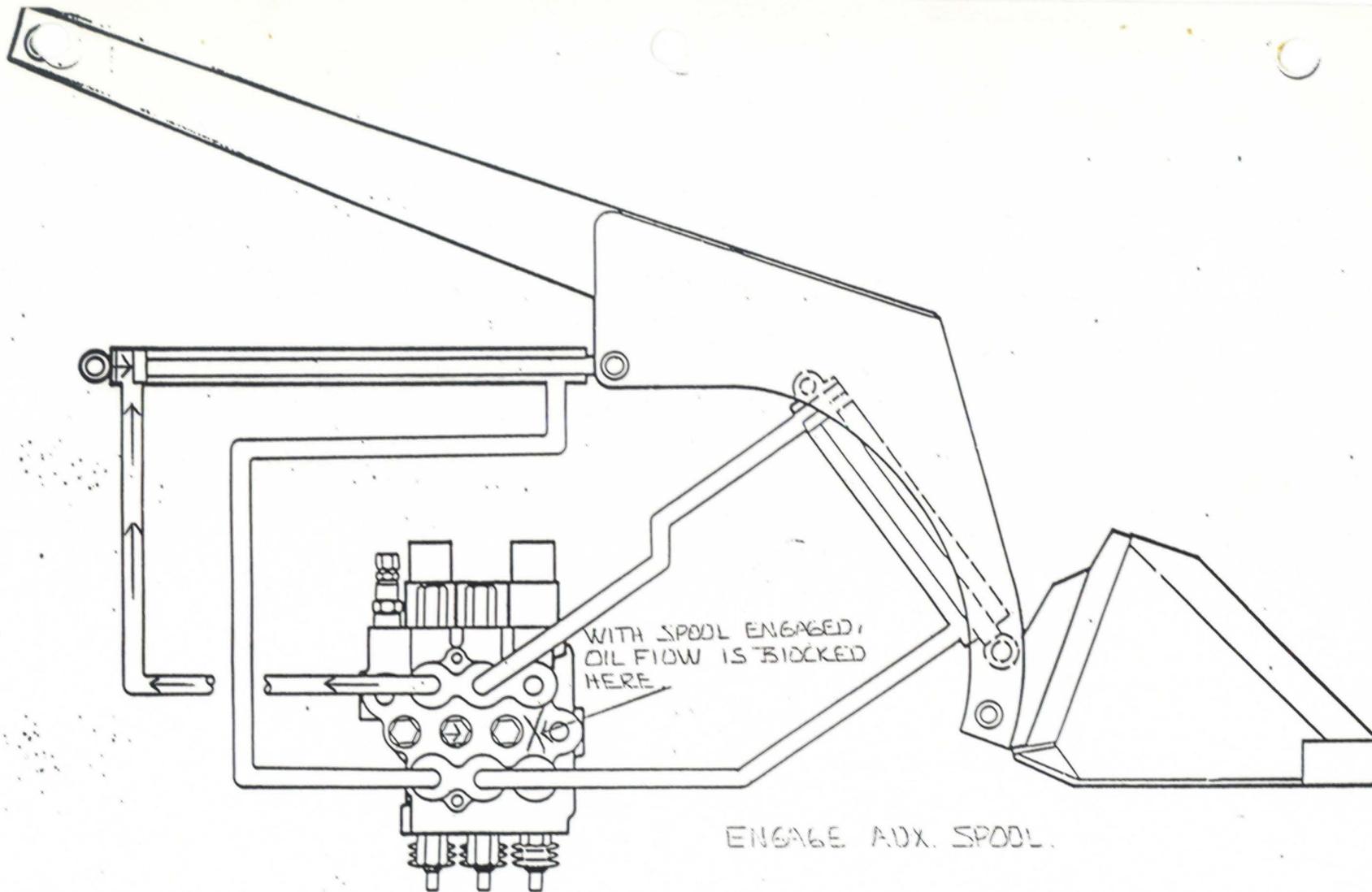
1> ALLOW THE MACHINE TO SET SO THE CYLINDERS AND THE OIL ARE COOL. 2> WARM THE HYDRAULIC OIL TO 100 - 140 DEGREES FAHRENHEIT WITH A Y90 HYDRAULIC TESTER CONNECTED TO THE AUXILIARY CIRCUIT. THE OIL MAY BE WARMED BY DRIVING THE LOADER FOR 10 - 15 MINUTES. DO NOT OPERATE THE BOOM OR TILT CYLINDER WHILE DRIVING. THIS WILL KEEP COOL OIL IN THE CYLINDER. LOWER THE BOOM FULLY. 3> WITH THE ENGINE RUNNING AT FULL RPM, DEPRESS THE TOE OF THE LIFT PEDAL FOR 30 SECONDS. RELEASE THE PEDAL FOR 10 SECONDS AND DEPRESS THE TOE 3 - 4 MORE TIMES FOR 30 SECONDS EACH TIME. 4> TOUCH THE OUTER SURFACE OF EACH LIFT CYLINDER AT THE BASE END. IF THE PISTON SEAL WAS LEAKING INTERNALLY, THE CYLINDER WILL BE HOT IN THE AREA OF THE LEAK. THE OPERATOR SHOULD SHUT OFF THE ENGINE AND LOWER THE BOOMS BEFORE GETTING OFF TO INSPECT THE LIFT CYLINDERS.



MODEL 743  
#3

**PORT RELIEF TEST:** TO DETERMINE IF THE O-RING SEALS ON THE PORT RELIEF ARE LEAKING, FOLLOW THIS PROCEDURE.

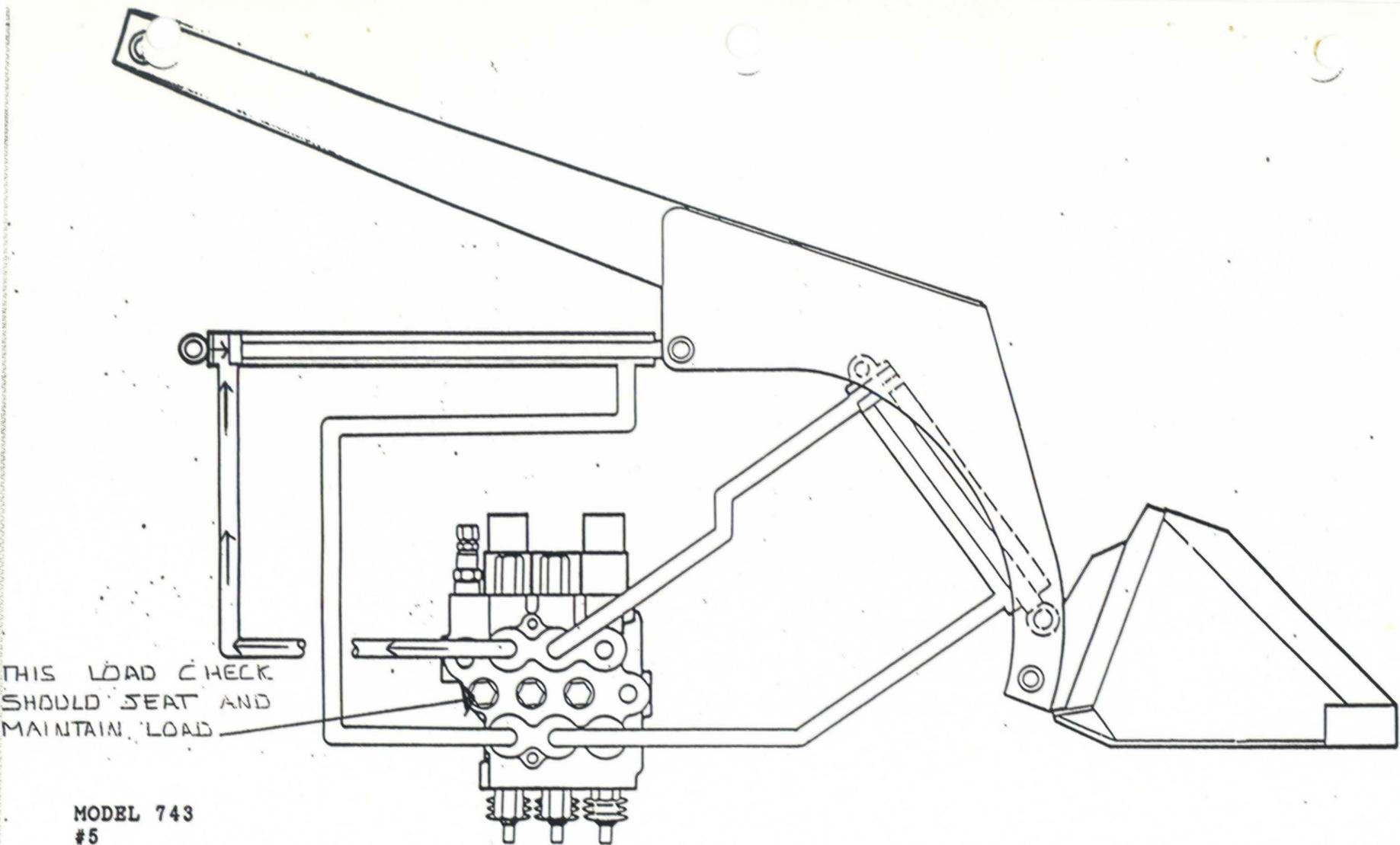
1> RAISE THE BOOM 1/2 WAY UP. ALLOW THE LIFT SPOOL TO RETURN TO NEUTRAL. STOP THE ENGINE. 2> THE PORT RELIEF SHOULD BE ON ITS SEAT. 3> IF IT LEAKS, OIL WILL GO TO THE TANK RETURN PORT OF THE VALVE AND THE BOOM WILL DROP SLOWLY. OIL IS THUS LEAKING PAST THE O-RING SEALS ON THE PORT RELIEF. ENGAGE THE AUXILIARY LEVER AND SPOOL WITH NO ATTACHMENT CONNECTED. THIS WILL DETERMINE IF THE PORT RELIEF IS LEAKING OR IF THERE IS A DAMAGED SPOOL. IF THE SPEED OF THE BOOM DRIFT DOES NOT CHANGE, IT IS A LEAKY PORT RELIEF. OIL IS GOING TO THE TANK PORT. IF DRIFT BECOMES VERY SLOW OR STOPS, IT IS A SCORED SPOOL AND THE PORT RELIEF IS OKAY.



MODEL 743  
#4

**TEST FOR SCORED SPOOL:** THIS TEST IS TO BE PERFORMED AFTER THE CYLINDER TEST PROVES THE PISTON SEALS ARE OKAY. TO DETERMINE IF THE SPOOL IS SCORED ON THE MELROE VALVE, FOLLOW THIS PROCEDURE.

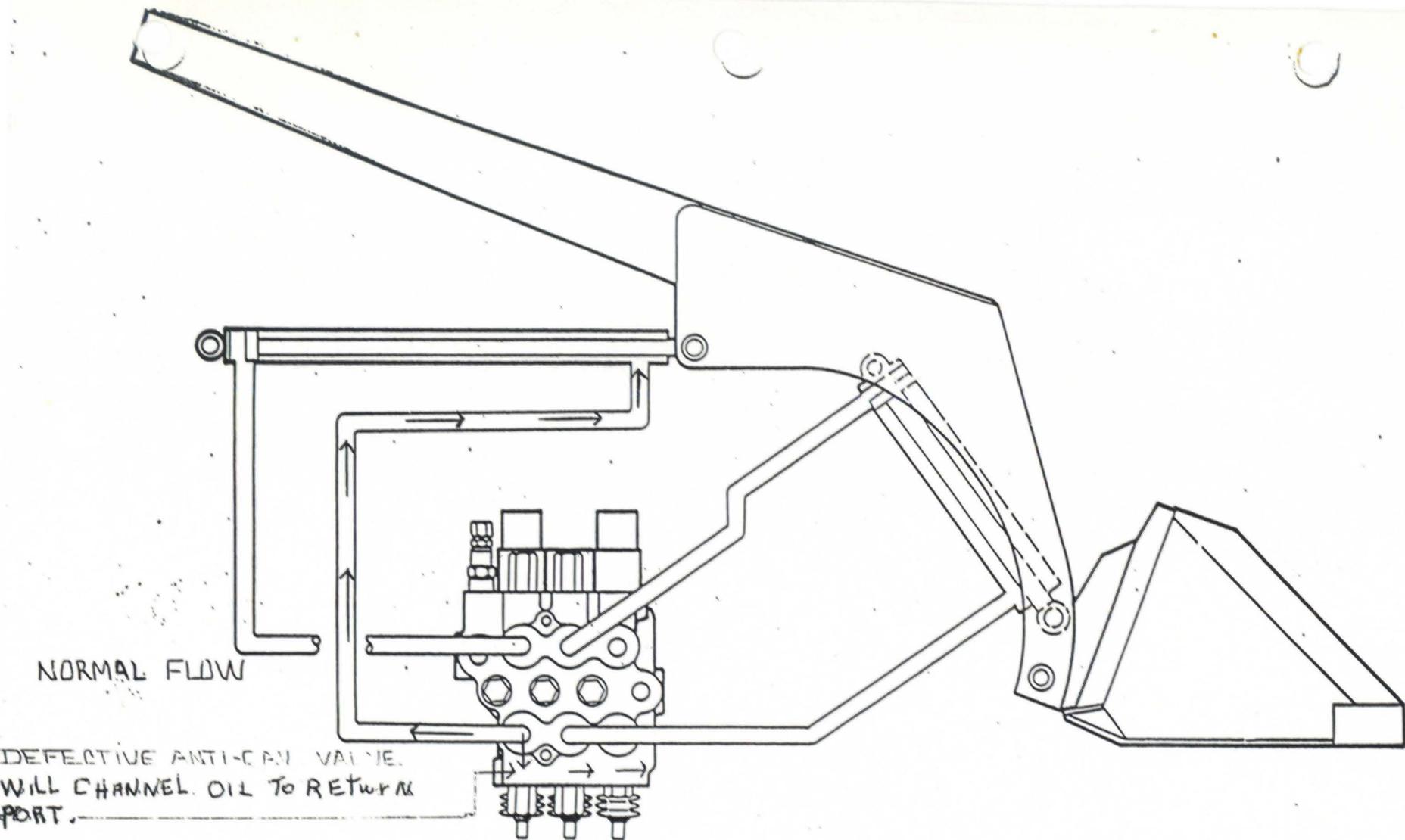
1> RAISE THE BOOM FULLY. OIL NEEDS TO BE AT OPERATING TEMPERATURE DURING TEST. 2> ALLOW THE LIFT SPOOL TO RETURN TO NEUTRAL. SHUT OFF THE ENGINE. THE LIFT CYLINDER SHOULD NOT DRIFT MORE THAN 1.3" IN 10 MINUTES. 3> IF THE BOOM IS DRIFTING DOWN, ENGAGE THE AUXILIARY CONTROL LEVER WITHOUT ATTACHMENT, AND SEE IF THE BOOM STOPS. IF THE BOOM STOPS AT THIS POINT, OIL WAS COMING PAST THE SPOOL ON THE LIFT VALVE SECTION. OIL IS GOING TO OPEN CENTER AND FEEDS THE CENTER POWER PORT. BY HAVING THE AUXILIARY SPOOL ENGAGED, IT STOPS THE FLOW OF OIL FROM THE POWER PORT TO THE TANK PORT.



**LOAD CHECK TEST:** THIS TEST IS TO BE PERFORMED AFTER DOING CYLINDER TESTS. TO DETERMINE IF THE LOAD CHECK IS SEATED AND HOLDING UNDER PRESSURE, FOLLOW THIS PROCEDURE.

1> RAISE THE BOOM FULLY WITH A 1/2 LOADED BUCKET. STOP THE ENGINE. 2> FOOT PEDAL SHOULD BE IN THE NEUTRAL POSITION WHEN SHUTTING THE ENGINE OFF. 3> DEPRESS THE HEEL OF THE LIFT PEDAL ACTIVATING THE LIFT CONTROL SPOOL. 4> THE LOADED BUCKET SHOULD PUSH THE ROD INTO THE LIFT CYLINDER AND THE LOAD CHECK SHOULD BE ON IT'S SEAT. IF THE BOOM DROPS, THE LOAD CHECK IS NOT SEATED.

ANOTHER TEST OF A DEFECTIVE LOAD CHECK IS TO RAISE A LOADED BUCKET TO THE 1/2 RAISED POSITION. PLACE THE SPOOL IN NEUTRAL, DEPRESS THE HEEL OF THE LIFT PEDAL. THE BOOM SHOULD CONTINUE TO RAISE WITHOUT DROPPING. IF THE BOOM DROPS A SHORT DISTANCE BEFORE IT RAISES, THE LOAD CHECK IS DEFECTIVE. THIS TEST COULD ALSO BE USED FOR BUCKET LOAD CHECK TESTS.

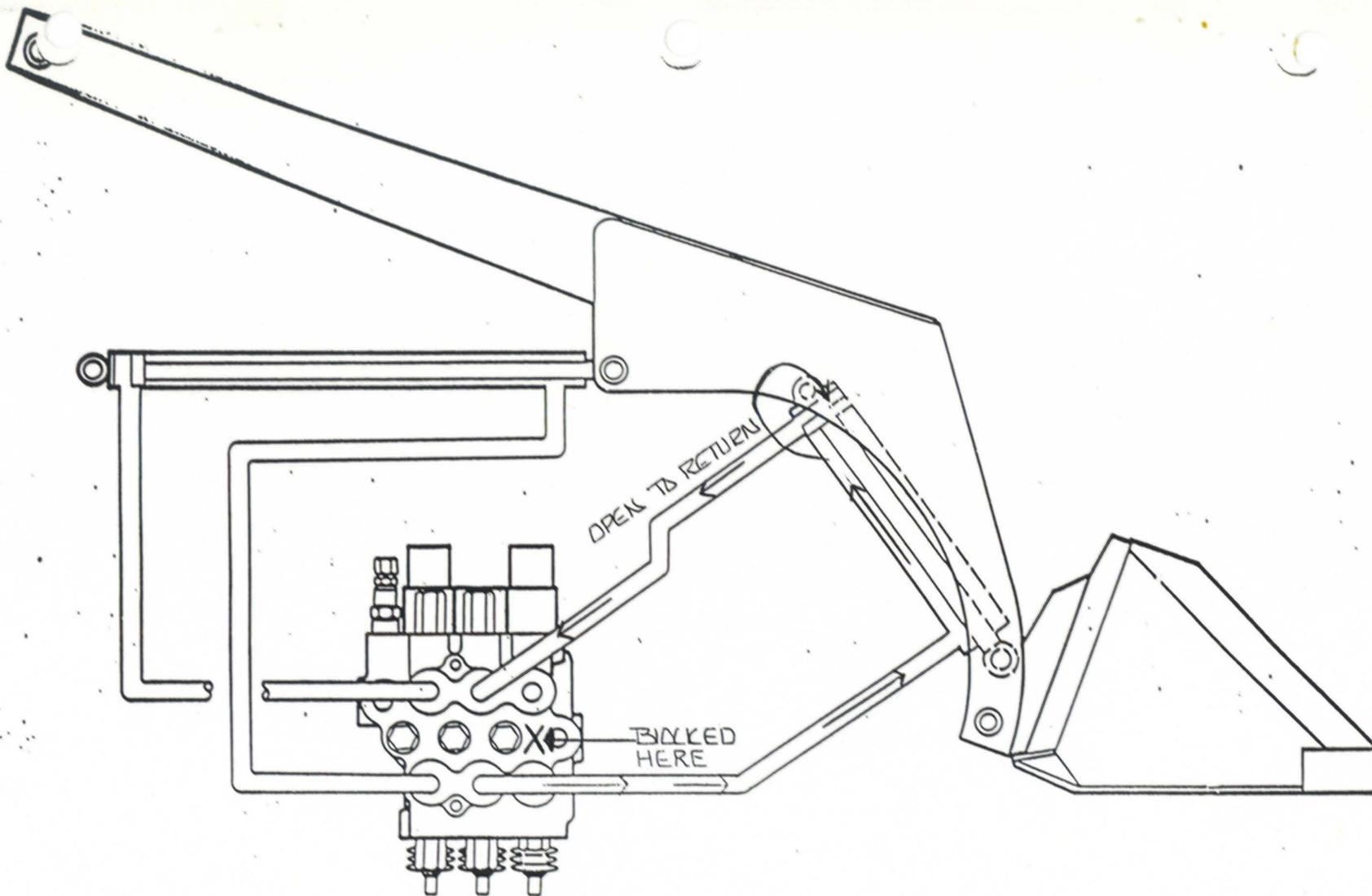


NORMAL FLOW

DEFECTIVE ANTI-CAV VALVE.  
WILL CHANNEL OIL TO RETURN  
PORT.

MODEL 743  
#6

**ANTI-CAVITATION VALVE:** THE ANTI-CAVITATION VALVE FUNCTION IS TO ALLOW TANK RETURN OIL TO FEED A PRESSURE PORT AND PREVENT CAVITATION OF A CYLINDER. A SYMPTOM OF AN DEFECTIVE ANTI-CAVITATION VALVE STUCK OPEN WILL BE NO POWER DOWN ON THE BOOMS. A DEFECTIVE ANTI-CAVITATION VALVE WILL ALLOW PRESSURE OIL TO DUMP DIRECTLY TO THE TANK PORT. AN ANTI-CAVITATION VALVE STUCK CLOSED WILL ALLOW AIR INTO THE SYSTEM AND THE HYDRO. LIGHT WILL FLICKER.



MODEL 743  
#7

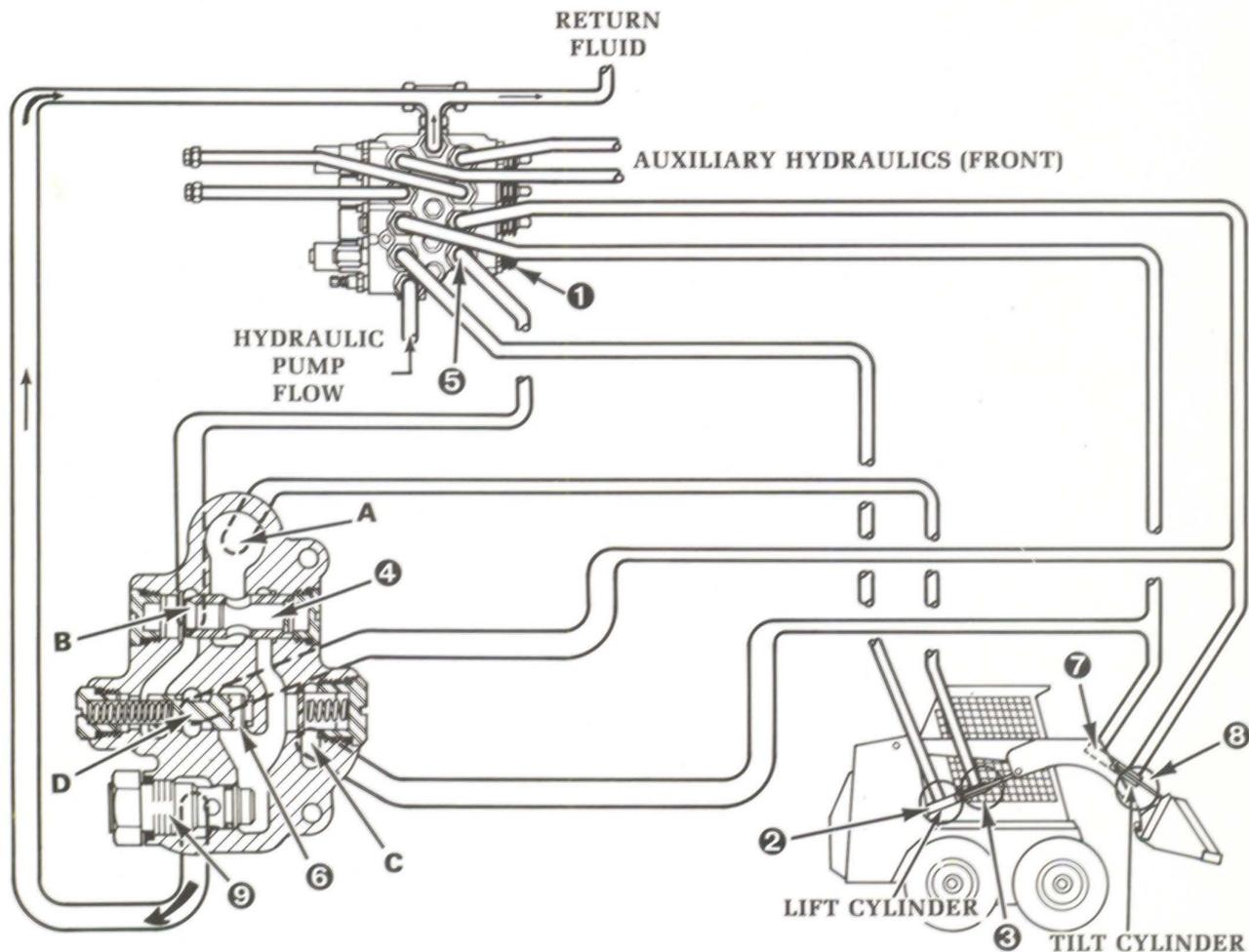
**TILT CYLINDER AND SPOOL TEST:** TO DETERMINE IF A TILT CYLINDER IS SCORED DEFECTIVE, OR IF THE PISTON SEAL IS BROKEN, FOLLOW THIS PROCEDURE.

1> WITH THE ENGINE RUNNING, ENGAGE THE AUXILIARY HYDRAULIC CONTROL LEVER (WITHOUT STABILIZER ON). THIS WILL BLOCK THE OIL FLOW FROM GOING THROUGH THE AUXILIARY VALVE. 2> DEPRESS THE HEEL OF THE TILT PEDAL, THUS PRESSURIZING THE ROD END OF THE TILT CYLINDER. THE BASE END OF THE TILT CYLINDER IS OPEN TO THE RETURN PORT (OPEN CENTER POWER BEYOND) HOWEVER, WITH THE AUXILIARY SPOOL ENGAGED, OIL CANNOT FLOW FROM THE BASE END OF THE TILT CYLINDER. 3> IF THE PISTON SEAL ON TILT CYLINDER IS DEFECTIVE, THE PRESSURIZED ROD END OIL WILL FLOW PAST THE PISTON SEAL PRESSURIZING THE BASE END OF THE TILT CYLINDER AND FORCING THE BUCKET TO DUMP.



# SERVICE TRAINING

## INFORMATION SHEET 843 BUCKET POSITION VALVE (Cessna)



As the lift spool **1** is moved to raise the boom, the pump flow is directed to the base end **2** of the lift cylinders. As the cylinder begins to move outward, rod end **3** oil flows to the inlet port **A** of the bucket position valve. The oil flows into the center of the flow divider **4**. Part of the oil flows out the left end of the flow divider, out port **B** and back to the lift rod end port **5**. The metered flow thru the right end of the flow divider follows the channel thru the check valve and out port **C** to the base end **7** of the tilt cylinder. This flow is also against the right end of the unloading spool **6**. Since there is no flow out the rod end **8** of the tilt cylinder, pressure in the base end circuit begins to rise. As the pressure increases, the unloading spool is forced to the left. This action opens a passage for the tilt rod end oil to enter port **D** and pass thru the unloading spool & join with the flow out port **B**. The relief valve **9** protects the circuits when the tilt is fully extended and the lift is activated to raise the boom and activate the bucket position circuit.