

Fault Finding (continued)**Functional Test of Control Valve**

If the rear lift arms do not function correctly carry out the following tests.

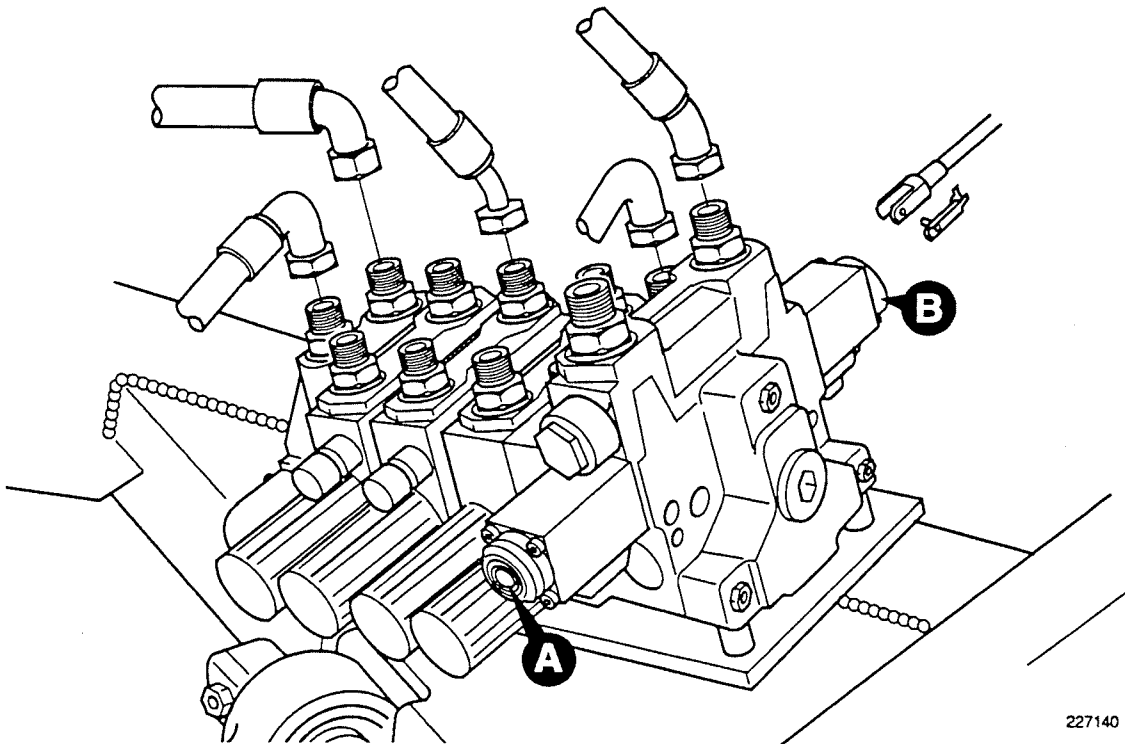
Note: In order to test the control valve, draft links must be loaded to approximately 800 kg (1700 lb).

⚠ WARNING

The procedure below must be carried out with the engine running. Apply the parking brake, chock the wheels and ensure that no-one enters the cab.

SUS 1-1

- 1 Start engine.
- 2 When button **A** on the control valve is pressed, the lift arms should lower to their lowest position.
- 3 When button **B** on the control valve is pressed, the lift arms should rise to their highest position.
- 4 If the functions at steps 2 and 3 operate correctly, the fault is electrical. If the arms do not raise or lower smoothly at steps 2 and 3, the fault is hydraulic.
- 5 Use the Fault Finding table on the next page to identify the fault.



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Fault Finding (continued)**Arms Cannot be Raised or Lowered**

Run engine at tickover

CHECK	ACTION
1 Do hydraulics move when control valve solenoids are pressed manually?	YES: Check 2. NO: Check 3.
2 Are the relevant fuses intact?	YES: Check Diagnostic LED indication. NO: Renew fuses.
3 Are pump P3 flow and MRV settings correct?	YES: Renew defective control valve. NO: Check and adjust MRV/overhaul pump.

Arms Cannot be Lowered

Run engine at tickover, adjust setpoint control to fully lowered.

CHECK	ACTION
1 Is rate of drop control on minimum rate setting?	YES: Move to mid position. NO: Check 2.
2 Do arms move when control valve solenoids are pressed manually?	YES: Check Diagnostic LED indication. NO: Renew defective control valve.

Arms Cannot be Raised

Run engine at tickover, set height limitation control to maximum height.

CHECK	ACTION
1 Do arms move when control valve solenoids are pressed manually?	YES: Check Diagnostic LED indication. NO: Renew defective control valve.

Fault Diagnosis

The faults indicated by the flashing diagnostic LED (see **Interpreting the Diagnostic LED**) are classified in three categories, see below, and the control unit reacts accordingly.

1 Major Fault

As a result of such a fault the draft control is inhibited and locked up. The control unit shuts down to protect its output stages. Until the fault is cleared, control will remain inhibited and the diagnostic LED will flash every time an attempt is made to activate draft control. Once the fault has been cleared, draft control can be resumed by switching the ignition from OFF to ON and then carrying out the **System Activation Procedure**.

2 Moderate Fault

Moderate faults cause the same reaction as for major faults except that the control unit does not automatically shut down. Once the fault has been cleared, draft control can be resumed, with the ignition already ON, by carrying out the **System Activation Procedure**.

3 Minor Faults

Draft control is maintained, but the diagnostic LED operates. Wherever draft control is activated, the LED will operate until the fault has been rectified.

Interpreting the Diagnostic LED

All fault codes consist of two digits. The LED flashes the same number of times as the digit, e.g. six flashes for the number 6. It is therefore necessary to count the flashes following a long pause and then count the flashes following a short pause in order to decipher the digits, e.g. error code 37, shows as: long pause - three flashes - short pause - seven flashes. The LED keeps on repeating the two digit code.

Note: Some of the error codes utilise the same two digits, e.g. 14 and 41. To avoid confusion, remember that the first digit follows a long pause, the second digit follows a short pause.

Refer to **Error Codes** for fault details.

Error Codes

Major Faults

Error Code	Fault	Control Unit pin no.	Possible Cause
11	No output (raise circuit)	37	<ul style="list-style-type: none"> i Raise solenoid output stage faulty. ii Open circuit solenoid lead to pin 35. iii No voltage at pin 29 - check fuse C9.
12	No output (lower circuit)	19	<ul style="list-style-type: none"> i Lower solenoid output stage faulty. ii Open circuit solenoid lead to pin 35. iii No voltage at pin 29 - check fuse C9.
13	Short circuit (raise/lower circuit). Excessive current at pin 35.	35	Short circuit between pin 35 and 19 or 37. Possible solenoid short circuit.
14	Open circuit (raise/lower circuit). No current at pin 35 when solenoid actuated.	35	<ul style="list-style-type: none"> i Open circuit in lead(s) from pins 19, 37, 35 to solenoids. ii Possible solenoid fault (open circuit). iii No voltage at pin 29 - check fuse C9.
15	Rear button(s) not working.	9	<ul style="list-style-type: none"> i Open circuit from pin 9 to button feeds. ii Faulty button(s).
16	Control unit supplies faulty.	2 20	Stabilised supply faulty. Poor earth connection
17	Battery non-switched voltage.	29	Check battery.
18	Control lever A inoperative	21	Check continuity between control unit and control panel.

Error Codes (continued)**Moderate Faults**

Error Code	Fault	Control Unit pin no.	Possible Cause
22	Position sensor signal faulty.	6	<ul style="list-style-type: none"> i Sensor open circuit or not connected. ii Possible short circuit or short to earth. iii Position sensor needs adjusting.
23	Set command control D potentiometer signal faulty.	22	Potentiometer open circuit or not connected.
24	Upper limit control E potentiometer signal faulty.	3	Potentiometer open circuit or not connected.

Minor Faults

Error Code	Fault	Control Unit pin no.	Possible Cause
31	Right force-sensing pin signal faulty.	26	<ul style="list-style-type: none"> i Sensor open circuit or not connected. ii Possible short circuit or short to earth. iii Possible overload of force sensing pin.
32	Left force-sensing pin signal faulty.	7	
33	Battery switched voltage below 11.5V.	24	Check battery.
34	Lowering control C potentiometer signal faulty.	23	Potentiometer open circuit or not connected.
36	Mix control H potentiometer signal faulty.	4	Potentiometer open circuit or not connected.
37	Hitch fails to lift with active current at pin 37.	37	If engine running: <ul style="list-style-type: none"> i No oil pressure. ii Valve seized.

Control Valve

Removal and Replacement

Refer to Control Valve - External Hydraulics and Draft Control

Draft Pin

Removal and Replacement

Note: The machine is fitted with two draft pins. Only the left hand one is illustrated but procedures are the same for both.

The numerical sequence on the illustration is intended as a guide to removal.

For replacement, the sequence should be reversed.

When Removing

Ensure that lift arms are fully lowered. Stop engine and disconnect battery.

Ensure that arm **A** is supported by leaving lift rod **B** connected.

Disconnect sensor cable **5** at harness plug inside cab.

Remove keep plate **7** and withdraw pin **8**.

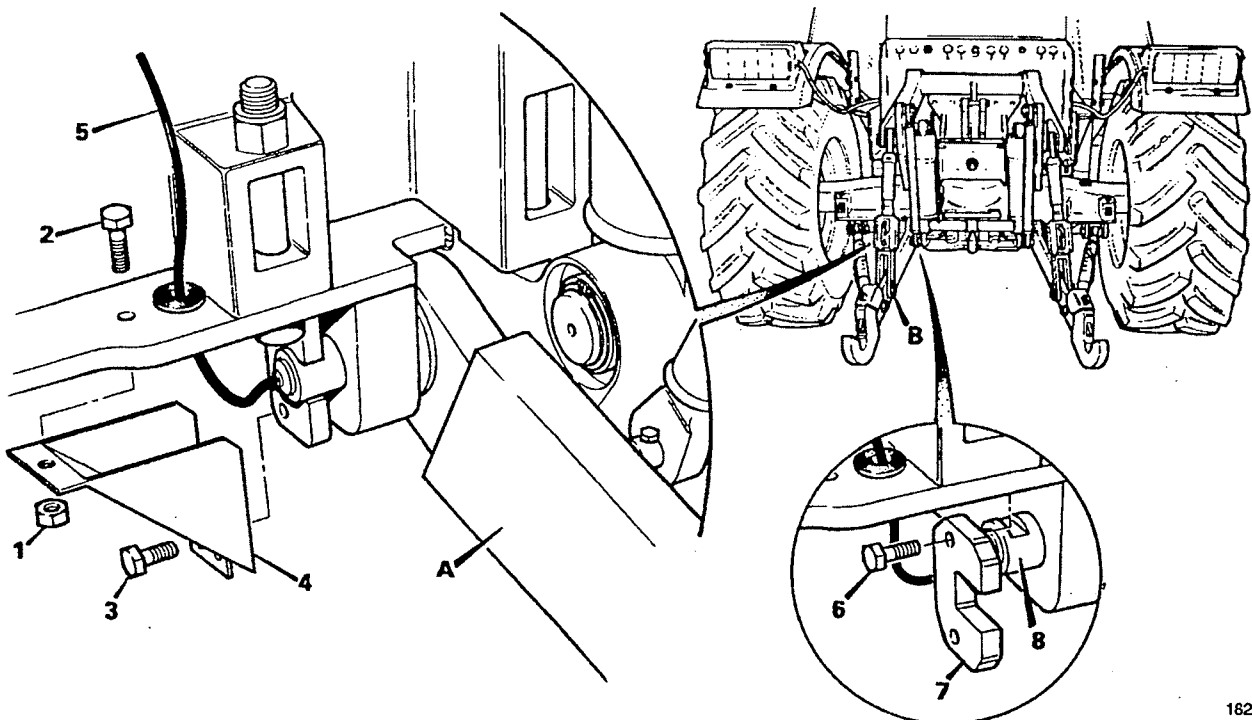
When Replacing

Before fully tightening bolt **6** and fitting cover **4**, screw in bolt **3** hand-tight to make sure that the bottom hole in the keep plate is in line with threaded bolt hole. Then tighten bolt **6** to the specified torque setting, remove bolt **3** and refit to secure cover **4**.

When connecting the wiring, allow sufficient un-clipped harness length to accommodate total suspension movement.

Torque Settings

Item	Nm	kgf m	lbf ft
1	56	5.7	42
3	56	5.7	42
6	56	5.7	42



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