Service Manual

FASTRAC 1115, 1115S, 1125 & 1135

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In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

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* Transporting the Machine

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.
5-2-5-9

Note: Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.

Make sure that the transporting vehicle is suitable. See **Static Dimensions** (SPECIFICATIONS section in the machine handbook) for the dimensions of the machine.

⚠ WARNING

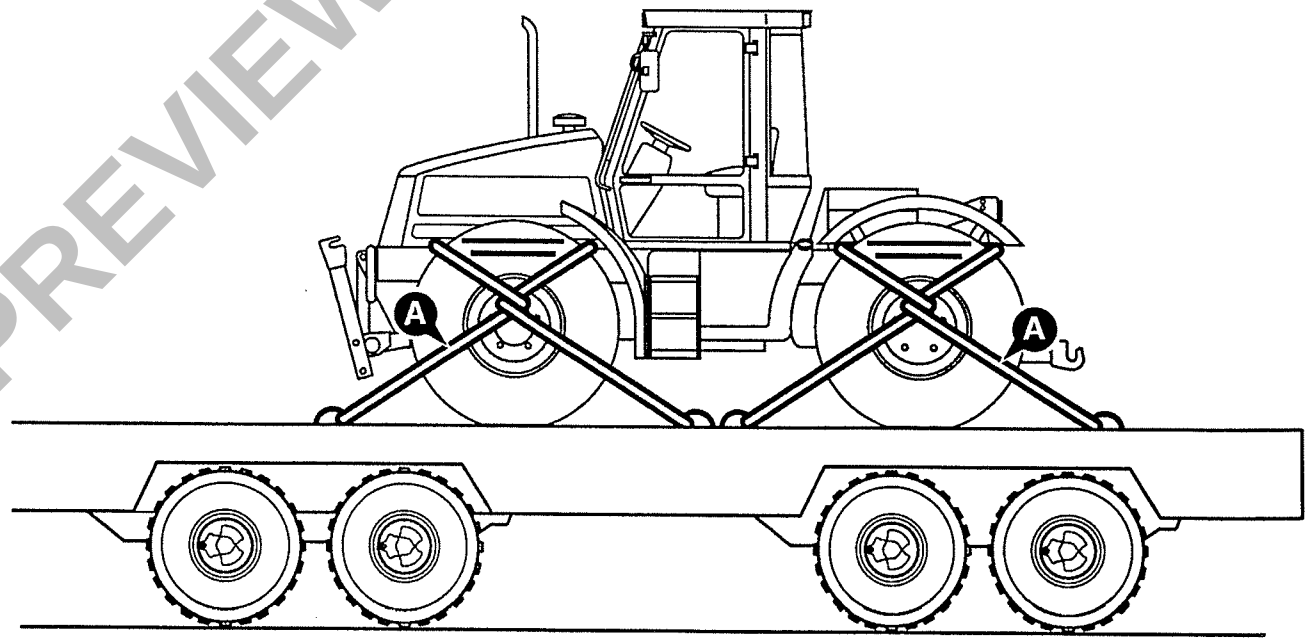
Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tyres. Make sure the machine will not foul on the ramp angle. See Static Dimensions in SPECIFICATIONS **section for the minimum ground clearance of your machine.**
2-2-7-5/1

1 Place blocks at the front and rear of the trailer wheels.

2 Move the machine on to the trailer as follows:
- **a** Make sure the ramps are correctly in place and secure.
- **b** Carefully drive the machine onto the trailer.
- **c** Set the drive to neutral and engage the parking brake.
- **d** Switch off the engine.
- **e** Ensure that the overall height of the load is within regulations.
- **f** Secure the cab.

3 Anchor the machine to the trailer with chains or suitable webbing straps. The preferred fixing is to use webbing straps individually fixing all four wheels to the deck of the trailer as at **A**. If chains are used they should be connected to a suitable part of the drawbar at the rear of the machine. At the front, use the tie down points. Avoid chaining any part of the machine where the chains may damage critical componentry. For example, chaining around either axle provides the possibility of damaging the steel brake pipes running along their length.

4 Measure the maximum height of the machine from the ground. Try to make sure the truck driver knows the clearance height before he drives away.



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* **Note:** New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately. DO NOT use a special running-in oil but use the oil recommended below from new.

ITEM	CAPACITY Litres (UK Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel	220 (48)	Diesel Oil (See **Types of Fuel**)	ASTM D975-66T Nos. 1D, 2D
Engine (Oil)	16.5 (3.6)	**JCB Super Multigrade 15W/40** -10 °C to 50 °C (14 °F to 122 °F) **JCB Super Universal Agricultural** -15 °C to 30 °C (5 °F to 86 °F) **JCB Torque Converter Fluid** -18 °C to 0 °C (0 °F to 32 °F) SEE **Note** ABOVE	SAE15W/40, API CF4/SF SAE10W/30, API CE/SF SAE10W, API CD/SF
Engine (Coolant)	20 (4.4)	**JCB Four seasons Antifreeze & Summer Coolant/water** (See **Coolant Mixtures**)	ASTM D3306, BS6580
PTO, Speed and Range Boxes (combined)	38 (8.4)	**JCB Super Universal Agricultural**	API-GL-4, MIL-L-2105
Front Axle **Housing** **Hubs (x2)**	 7 (1.56) 1.9 (0.4)	 **JCB HD90 Gear Oil**	 API-GL-5, MIL-L-2105C
Rear Axle (2WS)	23 (5.0)	**JCB HD90 Gear Oil**	API-GL-5, MIL-L-2105
Rear Axle (4WS) **Housing** **Hubs (x2)**	 17 (3.7) 2.0 (0.4)	 **JCB HD90 Gear Oil**	 API-GL-5, MIL-L-2105C
Brake System (Machines to Serial No. 737000)		Supplied from main hydraulic system (see below)	
Brake System (Machines from Serial No. 737001) **Front** **Rear**	 0.75 (0.17) 0.75 (0.17)	**JCB Universal Brake Fluid** **⚠ CAUTION** **Do not use ordinary hydraulic fluid in the brake or clutch systems.** 13-3-1-13	SAE J1703 DOT 4
Clutch System	0.5 (0.11)	**JCB Universal Brake Fluid**	SAE J1703 DOT 4
† Hydraulic System	75 (16.5)	**JCB Special Hydraulic Fluid HP46** (Above 38 °C, 100 °F) **JCB Special Hydraulic Fluid HP32** (Below 38 °C, 100 °F)	ISO VG46 ISO VG32
Grease Points	---	**JCB HP Grease**	Lithium complex NLGI No. 2 consistency including extreme pressure additives
Air Conditioning System **- Refrigerant** **(Machines to Serial No. 736115)** **(Machines from Serial No. 736116)** **- Compressor Lubricant**	 1.15 kg (2 lb 4 oz) 0.9 kg (2 lb) 0.24 (0.05)	 **HFC 134c** **HFC 134c** **Polyalkalineglycol**	 CH_2 FC F_3 CH_2 FC F_3 PAG SP20
Front PTO Transfer Box (optional)	3.0 (0.67)	**JCB HD90 Gear Oil**	API-GL-5, MIL-L-2105C

† **Note:** The total hydraulic system capacity depends on the equipment being used. Watch level indicator on hydraulic tank.

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Every 10 Operating Hours or Daily whichever occurs first

Clean
1 Machine generally.

Drain
2 Air system tank.

Check (Engine Stopped)
3 Generally for damage.
4 Engine coolant level and condition.
5 Fuel system for leaks and contamination.
6 Hydraulic fluid level.
7 Hydraulic system for leaks.
8 Engine and transmission for oil leaks.
9 Gearbox oil level.
10 Engine oil level and condition.
11 Tightness of wheel nuts.
12 Windscreen washer level.
13 Tyre pressures and condition.
14 Security of front weights (optional equipment).
15 Seat belt condition and security.
16 Brake fluid levels (from serial no. 737001).
17 Check radiator for blockage and clean if required.

Check (Engine Running)
18 Instrument readings and warning lights.
19 Operation of all electrical equipment.
20 Exhaust for excessive smoke.
21 Operation of clutch and footbrakes.
* 22 Parking brake operation.
23 Operation of steering.
24 Operation of transmission.
25 Operation of 3-point linkage.
26 Operation of front linkage (optional equipment).

Every 50 Operating Hours or Weekly whichever occurs first

Do the Daily jobs plus:

Drain
1 Fuel filter.
2 Fuel sediment bowl.

Check (Engine Stopped)
3 Fan belt tension and condition.
4 Air conditioning compressor drive belt.
5 Front PTO transfer gearbox oil level (optional equipment).
6 Clutch fluid level.
7 Cab air filter (Clean if required).
8 Propshaft Security

Grease
9 Rear PTO drive shaft splines and universal joints.
10 Rear PTO drive shaft bearings.
11 Front PTO drive shaft (optional equipment).
12 Front axle propshaft.
13 Rear axle propshaft.

Note: It is essential that drive shaft and propshaft joints are lubricated as specified.

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Torque Settings

Use only where no torque setting is specified in the text. Values are for dry threads and may be within three per cent of the figures stated. For lubricated threads the values should be REDUCED by one third.

Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

Metric Grade 8.8 Bolts

Bolt size Dia.	(mm)	Hexagon (A/F) mm	Torque Settings Nm	kgf m	lbf ft
M5	(5)	8	7	0.7	5
M6	(6)	10	12	1.2	9
M8	(8)	13	28	3.0	21
M10	(10)	17	56	5.7	42
M12	(12)	19	98	10	72
M16	(16)	24	244	25	180
M18	(18)	27	350	36	258
M20	(20)	30	476	48	352
M24	(24)	36	822	84	607
M30	(30)	46	1633	166	1205
M36	(36)	55	2854	291	2105

Metric - All Internal Hexagon Headed Cap Screws

Diameter mm	Torque Nm	kgf m	lbf ft
M3	2	0.2	1.5
M4	6	0.6	4.5
M5	11	1.1	8
M6	19	1.9	14
M8	46	4.7	34
M10	91	9.3	67
M12	159	16.2	117
M16	395	40	292
M18	550	56	406
M20	770	79	568
M24	1332	136	983

Hydraulic Hose to Adapter Connections

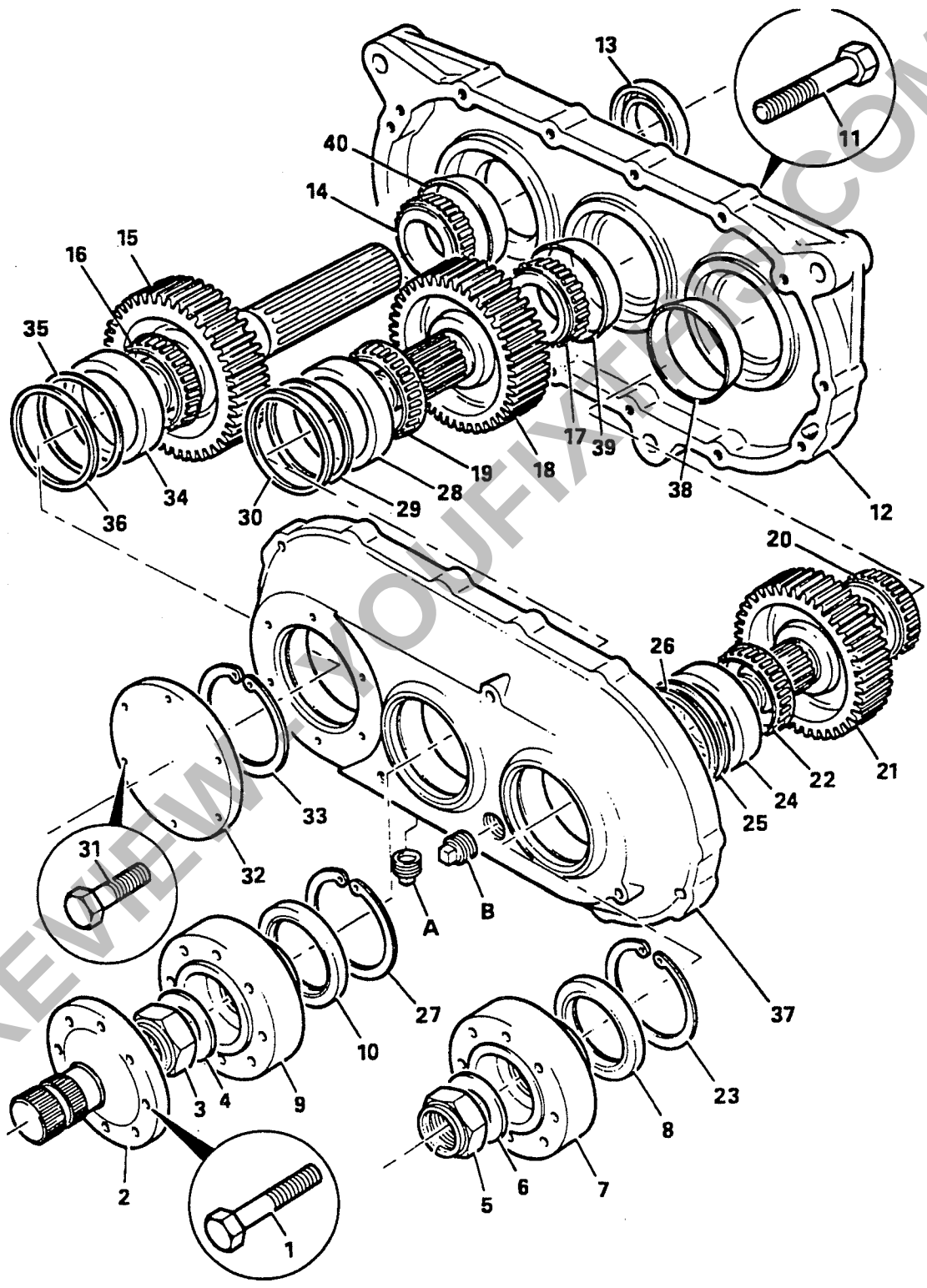
BSP Size (inches)	Torque Settings Nm	kgf m	lbf ft
1/8	14	1.4	10
1/4	24	2.5	18
3/8	33	3.3	24
1/2	44	4.8	35
5/8	58	6.0	43
3/4	84	8.6	62
1	115	11.8	85
1 1/2	244	24.9	180

Hydraulic Adapter into Component Connections with bonded washers

BSP Size (inches)	Torque Settings Nm	kgf m	lbf ft
1/8	20	2.1	15
1/4	34	3.4	25
3/8	75	7.6	55
1/2	102	10.3	75
5/8	122	12.4	90
3/4	183	18.7	135
1	203	20.7	150
1 1/2	305	31	225

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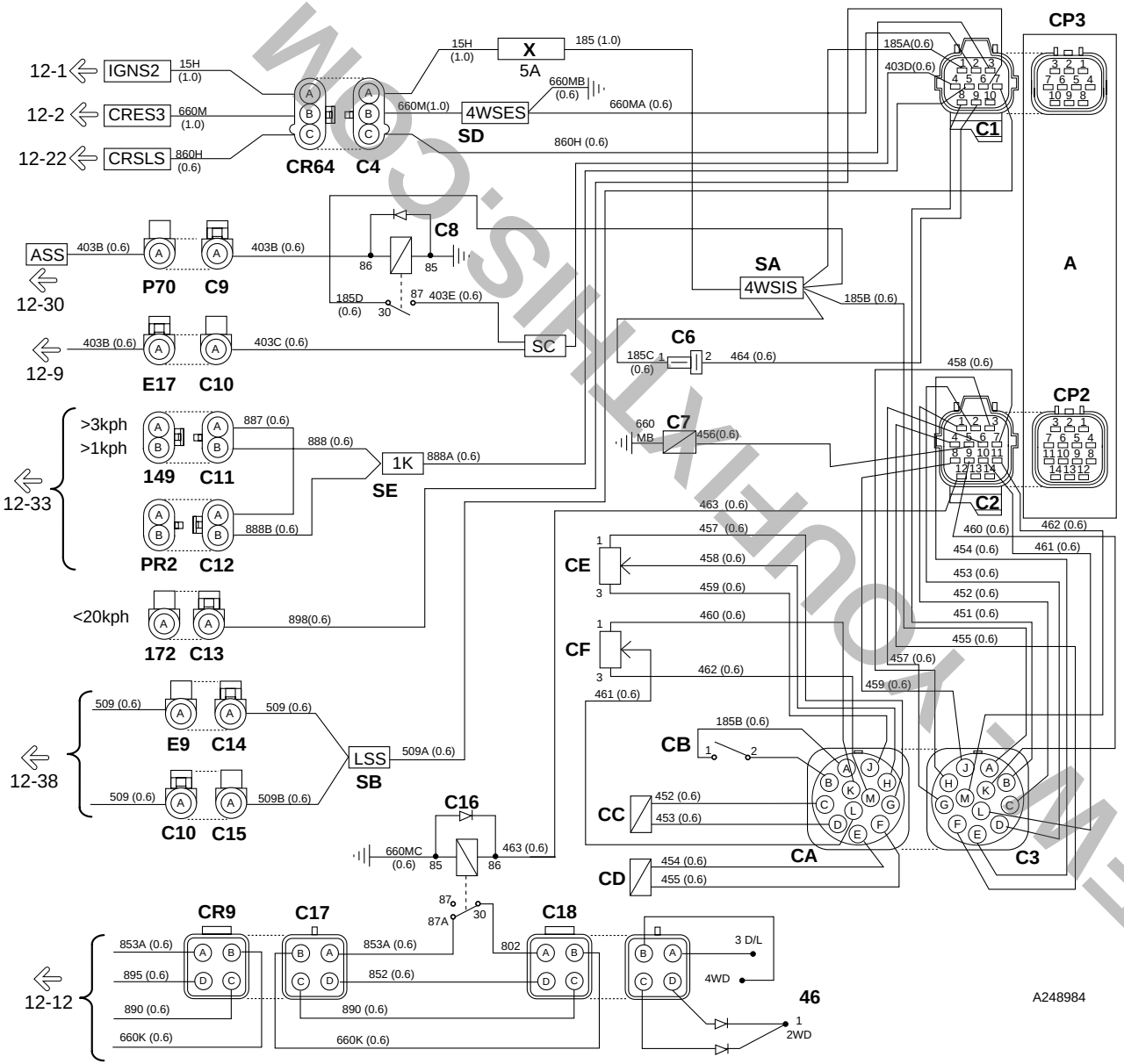
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4WS CONTROL CIRCUIT

Key

A 4WS Electronic Control Module

Connectors

C1 - Inputs

Pin 1	+12V ignition (main)
Pin 2	Earth (main)
Pin 3	+12V sidelights
Pin 4	+12V alternator charge
Pin 5	+12V >1 kph
Pin 6	+12V <20 kph
Pin 7	+12V EDC power override
Pin 8	+12V axle locked
Pin 9	+12V sprayer override - audible warning
Pin 10	Not used

C2 - Outputs

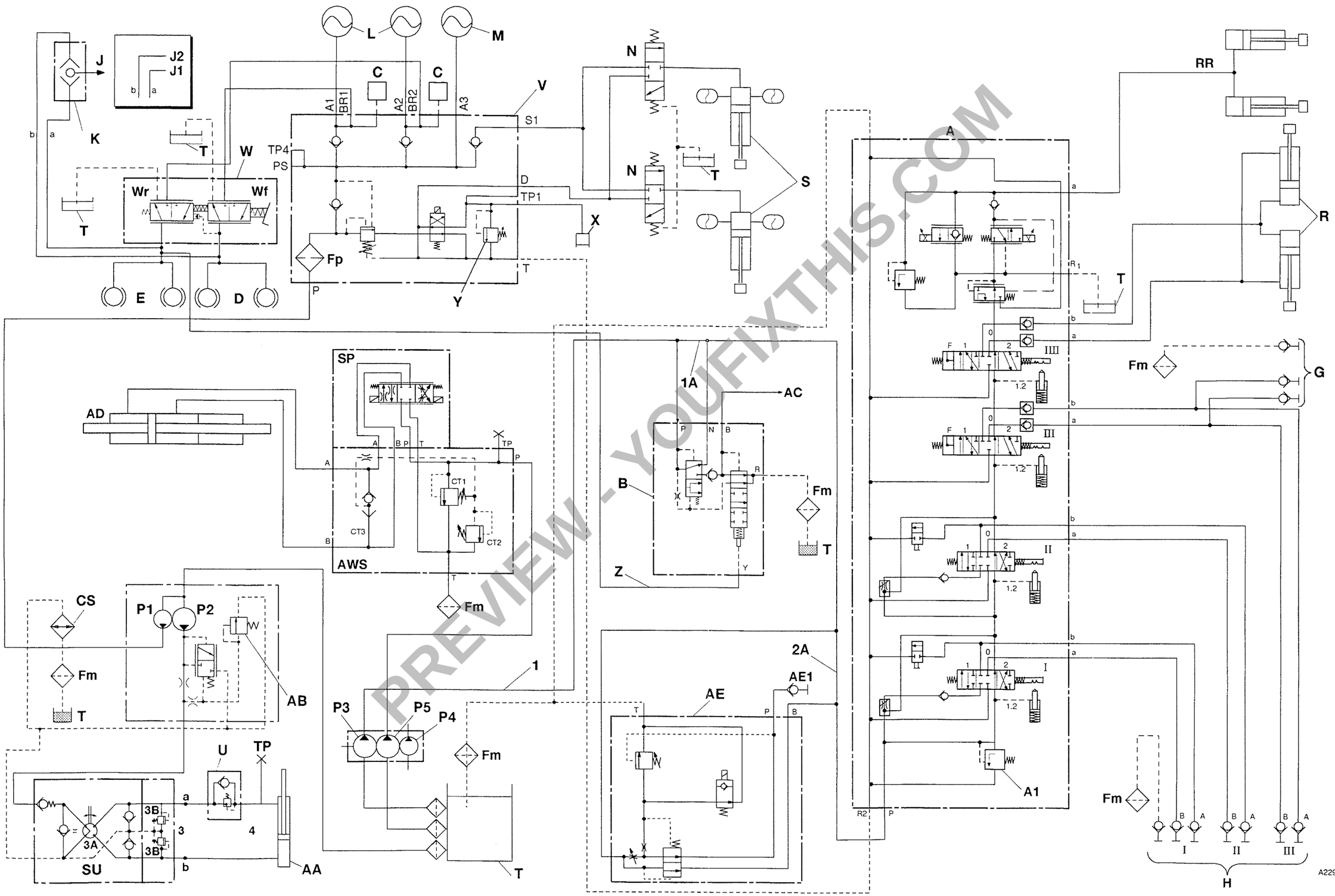
Pin 1, Pin 2	Left steering valve solenoid
Pin 3, Pin 4	Right steering valve solenoid
Pin 5	Axle unlock signal
Pin 6, Pin 7, Pin 8	Front axle sensor (potentiometer)
Pin 9, Pin 10, Pin 11	Rear axle sensor (potentiometer)
Pin 12	Differential lock cut-out signal
Pin 13, Pin 14	Not used

C3 Bulkhead connector
C6 Sprayer jack socket
C7 Axle lock air valve solenoid
C8 Alternator charge relay
C16 Differential lock cut-out relay
CA 4WS chassis harness connector
CB 'Ram locked' switch
CC Left steering valve solenoid
CD Right steering valve solenoid
CE Front axle potentiometer
CF Rear axle potentiometer
X In-line fuse (5 amps)

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Section C
Electrics
12 - 8B



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Foot Throttle Control Cable

*** (To Machine Number 737248)**

Removal

Slacken spring lock nut **1**. Loosen reaction bracket lock nuts **2** and **3** and remove the cable from reaction bracket **4**. Unhook spring **5** from throttle control lever **6**. Unscrew spring **5** from the cable and retain.

Remove the steering column shroud. Unlock and remove foot pedal clevis retaining pin **7**. Slacken clevis lock nut **8**. Remove clevis **9**, locknut **8** and bellows **10** from the cable end and, if being re-used, retain these items.

Slacken and remove engine/cab bulkhead cab side locknut **11** and push the cable forward through the bulkhead. Remove the complete cable.

Replacement

If fitting a new cable, remove clevis **9**, retaining pin **7**, clevis lock nut **8**, bellows **10** and rearmost bulkhead lock nut **11** from it.

Pass the cable end into the cab through the engine/cab bulkhead. Refit bulkhead lock nut **11**, bellows **10**, clevis lock nut **8** and clevis **9** to the cable, ensuring that the clevis is screwed onto the cable end until the cable end is visible in the clevis opening. Tighten bulkhead locknuts **11** and **12**.

Connect clevis **9** to pedal **13** by means of retaining pin **7**.

Slacken reaction bracket lock nuts **2** and **3** and fit the cable into reaction bracket **4**. Screw spring **5** onto the cable end and hook onto throttle control lever **6** ensuring that the lever is held in the closed position by its spring. Tighten lock nut **1**.

Adjust the position of the foot pedal, in relation to the other pedals, by slackening lock nut **8**, unlocking and removing clevis retaining pin **7** and screwing the clevis in or out, ensuring that enough rod thread remains in the clevis. Refit and lock clevis retaining pin **7**. Lock clevis with lock nut **8**. If there is insufficient adjustment using this method, slacken bulkhead lock nuts **11** and **12** and move the cable in or out as required. Tighten lock nuts **11** and **12** when satisfactory.

Take up any cable slack between throttle control lever **6** and reaction bracket **4** by disconnecting spring **5** and screwing it in or out, always ensuring that the throttle control lever is against the minimum stop **14**. Tighten lock nut **1**.

If further adjustment is required, release reaction bracket lock nuts **2** and **3** and move the cable forward or back to achieve the necessary adjustment. Tighten lock nuts **2** and **3**.

Get someone to press the foot pedal down to its maximum and check that throttle control lever **6** moves on to the maximum stop **15**. Adjust spring **5** so that with the throttle control lever **6** on the maximum stop **15** the spring is slightly extended.

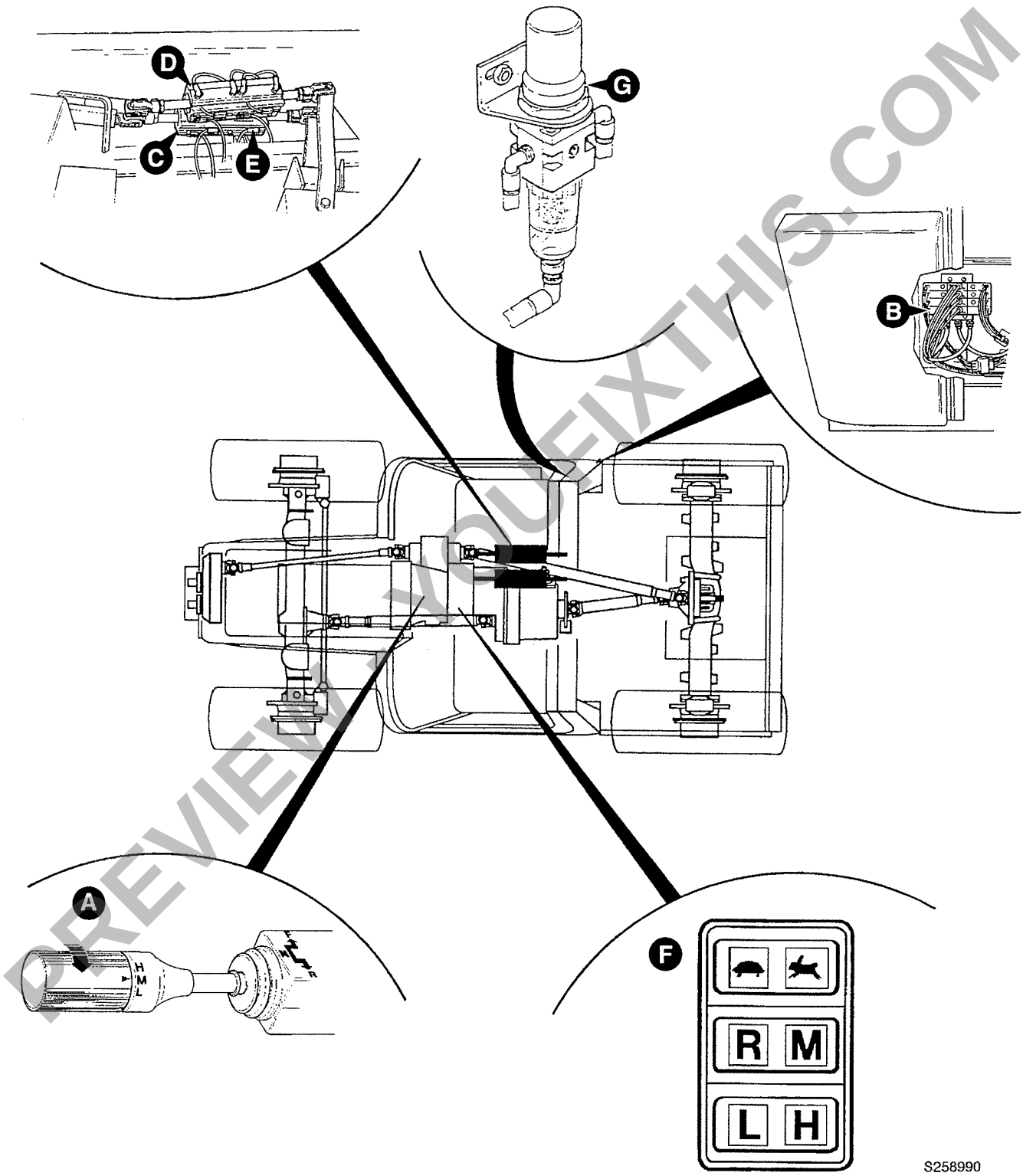
Check that all lock nuts are tight and that clevis retaining pin **7** is locked. Refit the steering column shroud. Close the bonnet.

Start the engine and progressively increase engine speed over the whole range. Check that the acceleration is smooth. Release the foot pedal and check that the engine speed falls to idle.

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Operation

Attaching an Implement
- Using Controls in Cab

1 Start the engine.

2 Move selector **H** to the top setting (Position Control).

3 Carry out the **System Activation Procedure**.

4 Adjust the linkage height using the height/depth control knob **D**. Indicators **J** and **K** will show whether the linkage is lifting or lowering.

5 To lift the linkage, turn the height/depth control knob **D** clockwise. The red indicator **J** will illuminate.

6 Engage the lower link hooks on the linkage balls and secure using latches **Z**. Finally, attach the top link and adjust as necessary.

Transport

1 Move selector **H** to the top setting (Position Control).

2 Move main control lever **A** to lift position (**1**).

3 Adjust the maximum lift height to suit the implement being transported, using maximum lift height control **E**. Start from the minimum setting (slide fully anti-clockwise) and move clockwise to increase the lift height.

4 When the implement is at the desired height, push in the red transport lock **B**, which will then prevent the main control lever from being moved to the lower position.

Attaching an Implement
- using External Controls (on fender)

1 Start the engine.

2 Move main control lever **A** to either neutral position (**2**) or lower position (**3**).

⚠ WARNING

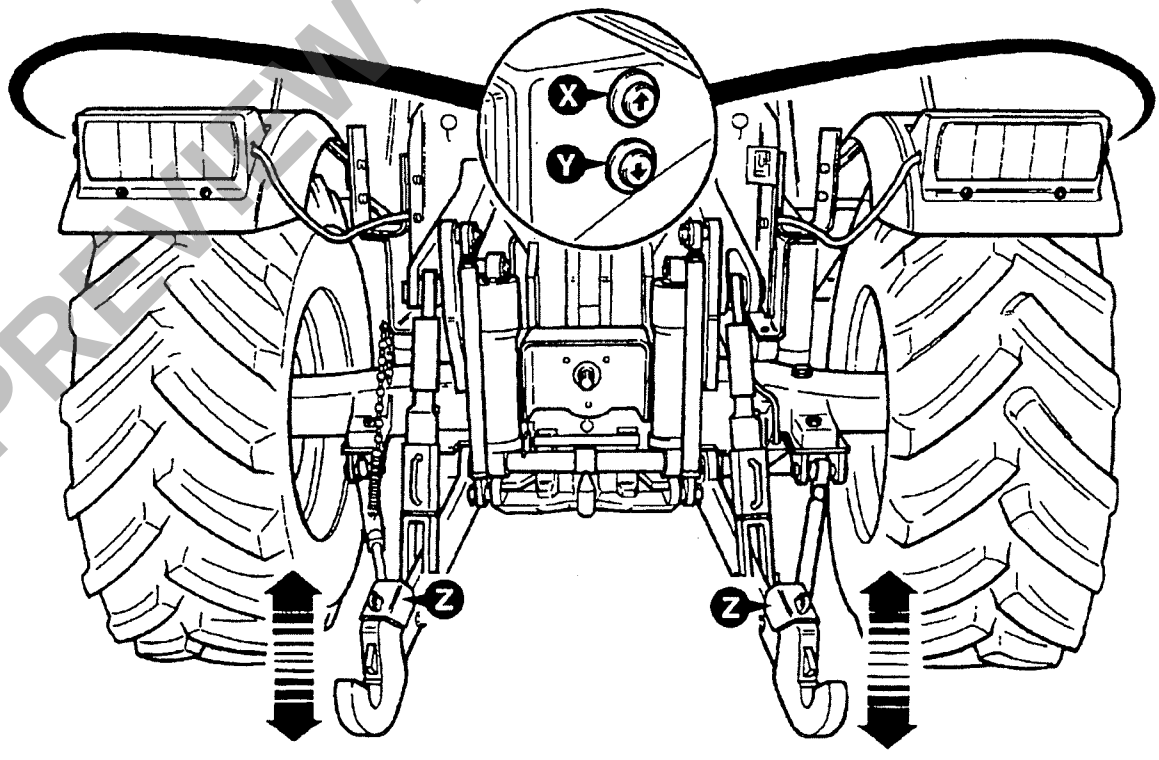
Keep clear of the linkage when using external controls.
13-2-1-3

3 Press button **X** to raise the linkage or button **Y** to lower it. The movement of the linkage will stop as soon as the button is released.

Note: The rate of drop of the linkage when the external control button is used is 70% of the maximum speed.

4 Engage the lower link hooks on the linkage balls and secure using latches **Z**. Finally, attach the top link and adjust as necessary.

5 Once the external controls have been used, remember to re-activate the control panel (see **System Activation Procedure**).



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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	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	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	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	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.

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Complete Transmission

If the problem is noise rather than loss of drive start at check 7.

CHECK		ACTION
1	Is drive being transmitted to the road wheels?	YES: Check 7. NO: Check 2.
2	Is the clutch actuation system functioning?	YES: Check 3. NO: Check clutch actuation.
3	Is the clutch slipping?	YES: Examine and repair clutch. NO: Check 4.
4	Are range and speed gearboxes both in gear?	YES: Check 5. NO: Engage gear/check gearchange linkages.
5	Is 6-speed gearbox heard to drive with the range gearbox in neutral?	YES: Check 6. NO: Remove and examine 6-speed gearbox.
6	Does rear axle driveshaft rotate with both gearboxes in gear?	YES: Check rear axle. NO: Check range gearbox.
7	Is fault noise rather than loss of drive?	YES: Check 8. NO: Check 10.
8	Is transmission noisy with speed gearbox in gear and range gearbox in neutral?	YES: Examine speed gearbox for worn/damaged components. NO: Check 9.
9	Isolate noise source to range box or rear axle or front axle by disconnecting relevant drive shafts.	Examine relevant transmission element for worn/damaged components.
10	Is transmission oil level low?	YES: Fill to correct level.

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Changing the Oil

⚠ WARNING

Make the machine safe before getting beneath it. Do the following: Park on level ground. Engage the parking brake. Lower any mounted implements to the ground. Stop the engine, remove the starter key, disconnect the battery. Chock the wheels.
13-3-1-1

* 1 Position level/drain plug **C** in both of the hubs at the bottom as shown at **A**.

* **Note:** Depending on the phasing of the hubs, it may not be possible to position both hub level/drain plugs at the bottom at the same time. In this case, do Step **2** at one hub, then rotate the axle and drain the other hub.

* 2 Place containers beneath the two hub level/drain plugs **C** and the axle casing drain plug **F**. Remove the plugs and allow the oil to drain.

⚠ WARNING

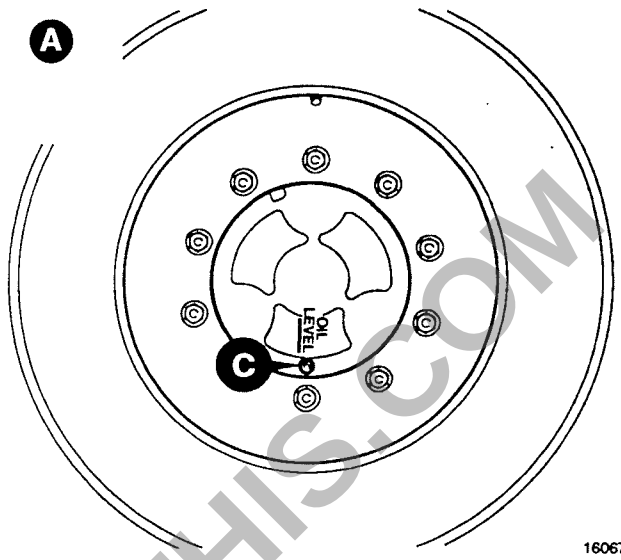
Oil will gush from the hole when the drain plug is removed. Keep to one side when you remove the plug.
2-3-4-2

* 3 Set **OIL LEVEL** mark on one of the hubs to the horizontal as shown at **B**, leaving out the plug **C**. Refit plug **C** on the other hub.

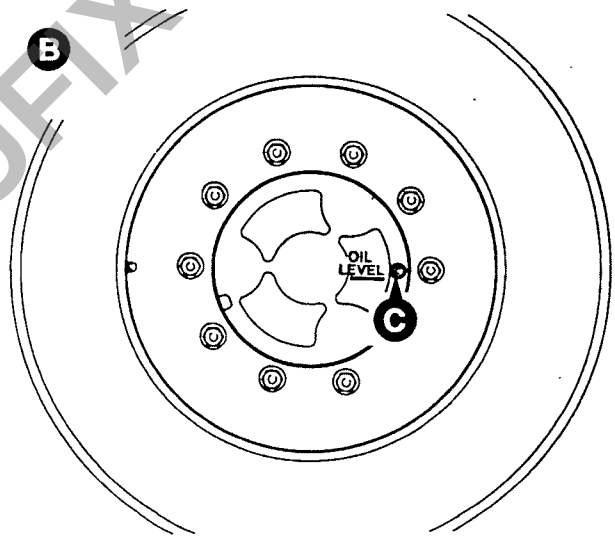
* 4 Clean the area around the filler plug **E**. Remove plug **E** and add the specified quantity of oil. Stop filling if oil runs from the hub. Clean and refit plug **C**.

* 5 Set **OIL LEVEL** mark on the other hub to the horizontal as shown at **B**. Clean the area around plug **C**, then remove the plug and its sealing washer. Oil should be level with the bottom of the hole. If necessary add more oil at filler plug **E**. Clean and refit plugs **C** and **E**.

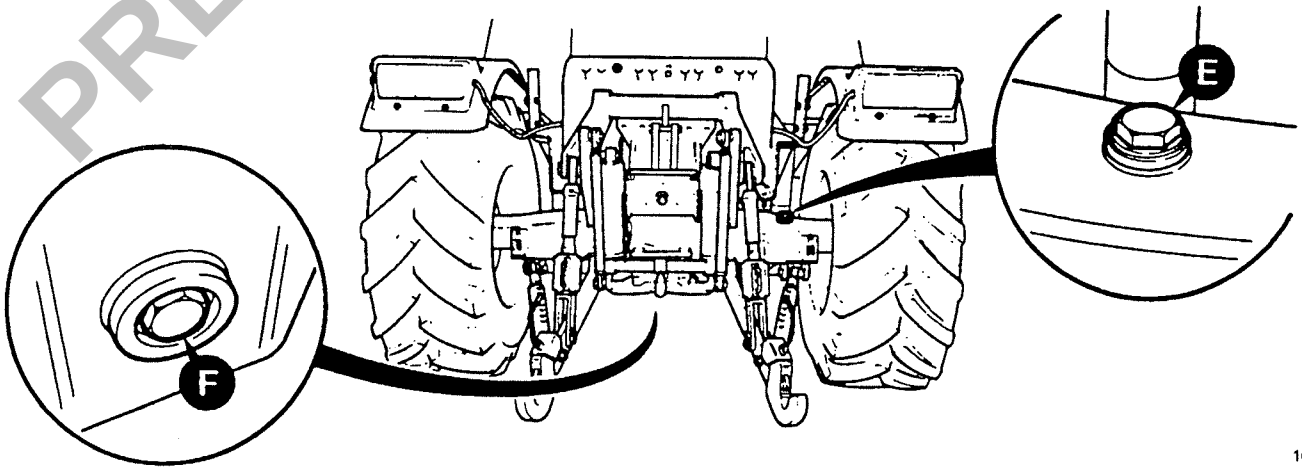
Note: Do not overfill as this would cause oil to be forced past the oil seals and out of the axle.



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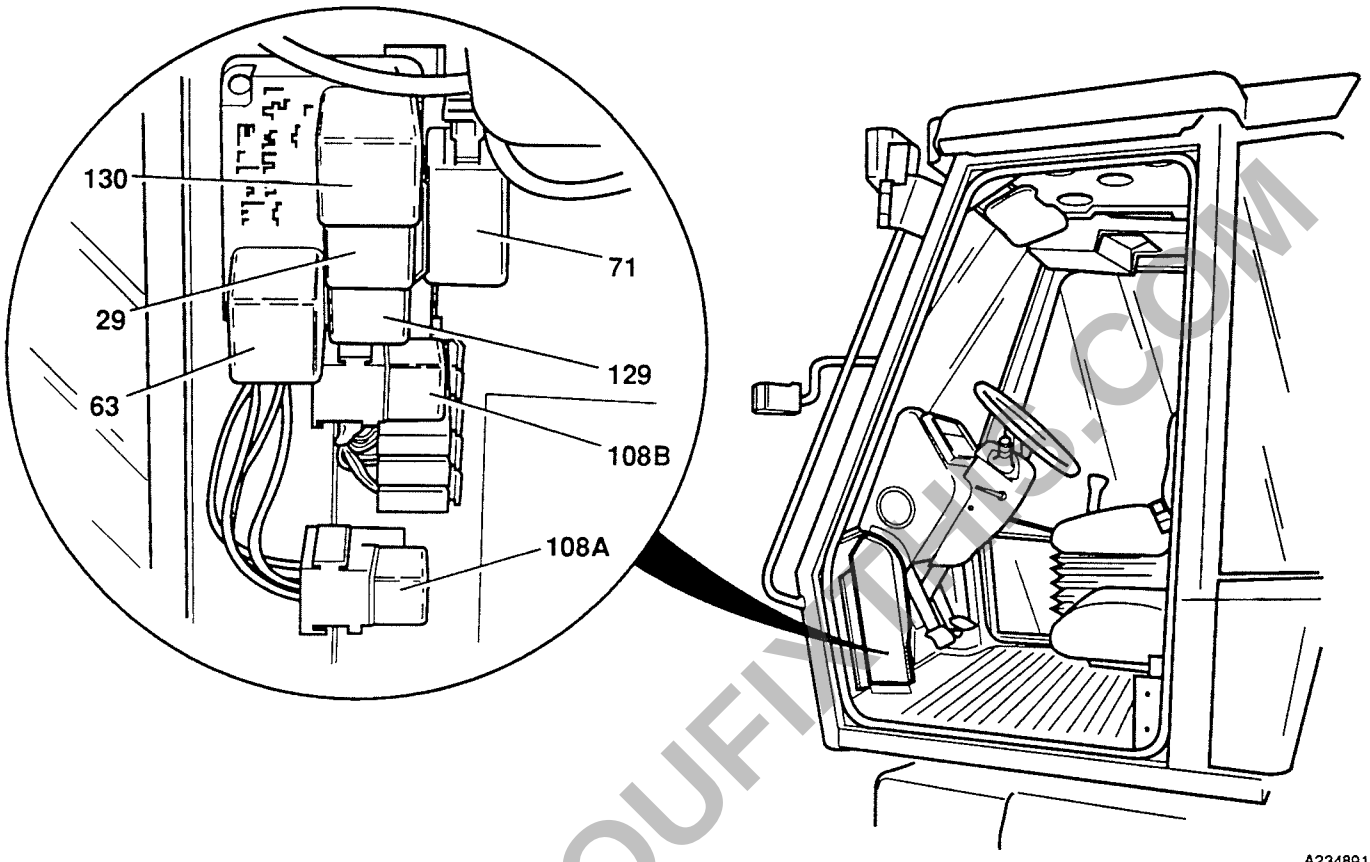


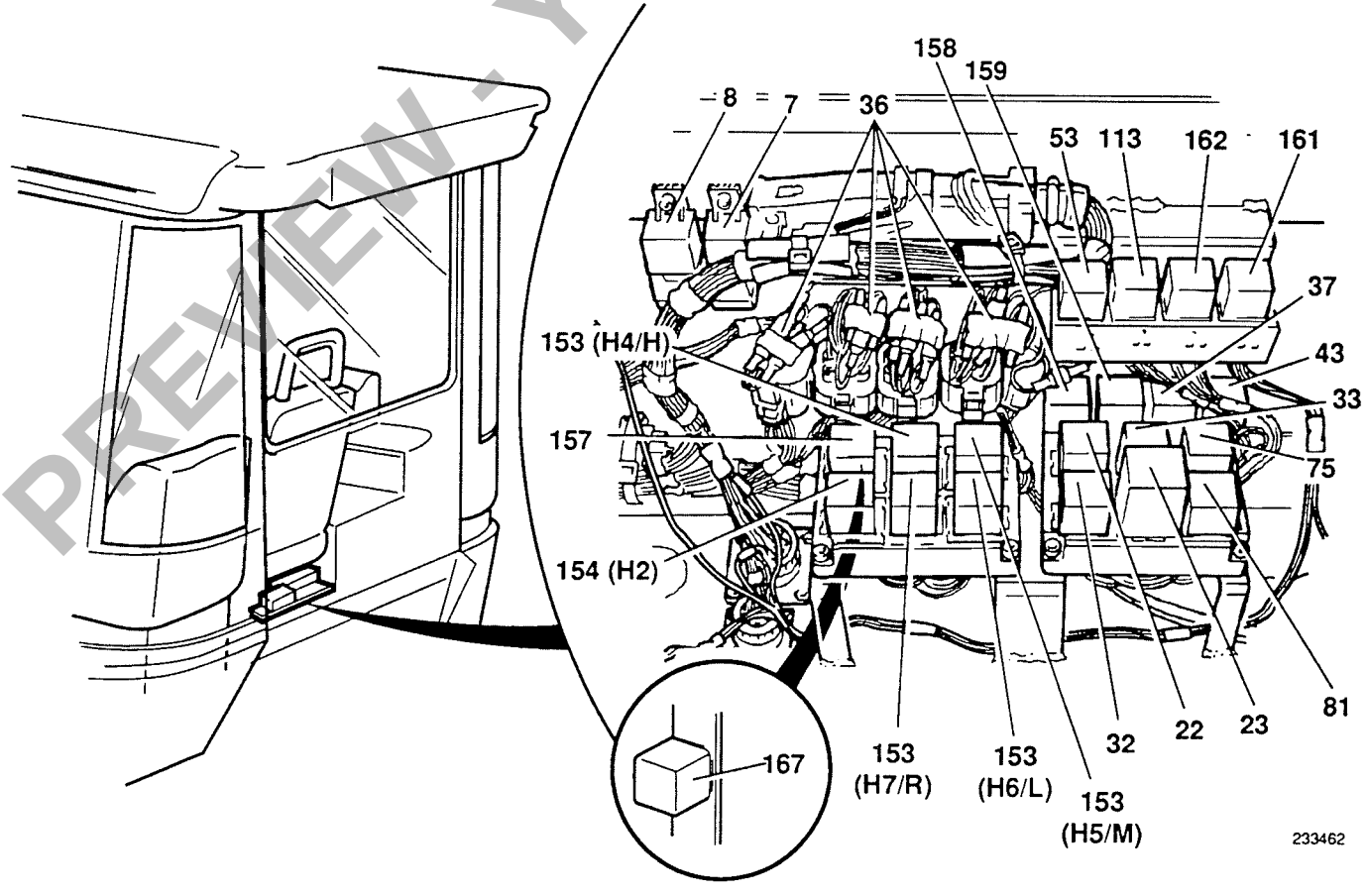
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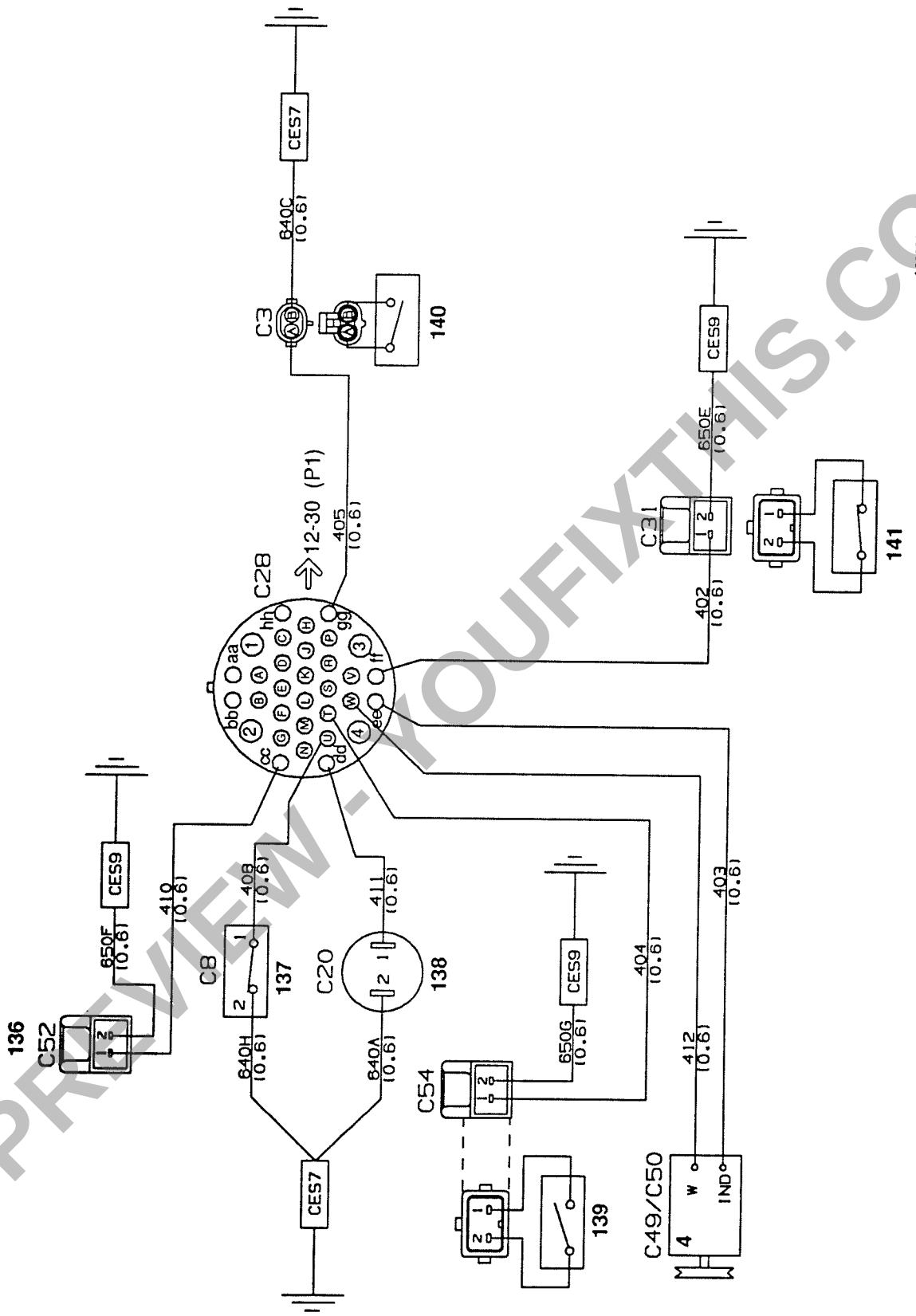
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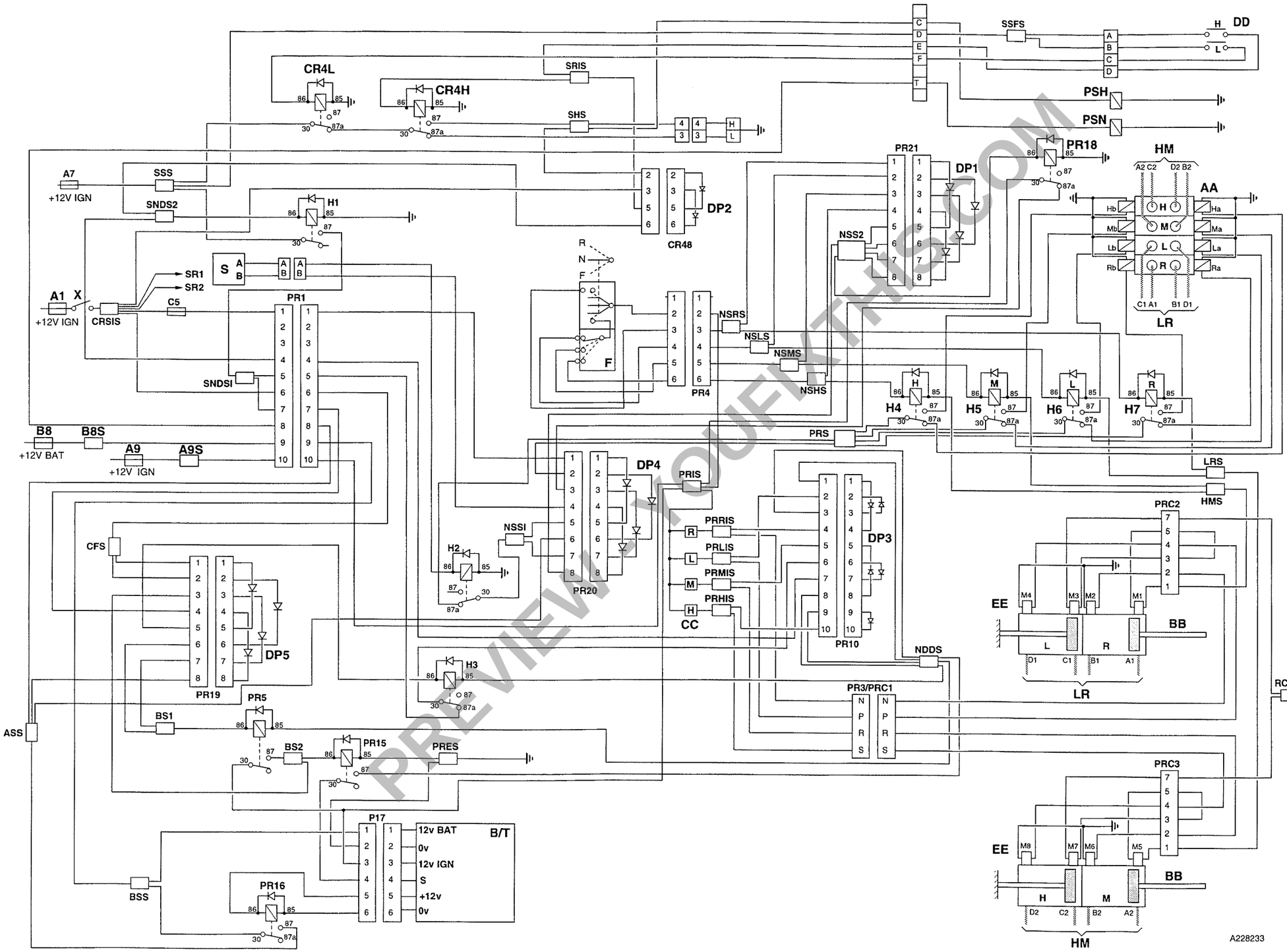
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* FUSE C4 (cont'd) - INSTRUMENT CLUSTER (CONTROLS) (Machines to No. 737000)

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Key

AA	Range select solenoid operated air valves
BB	Range select air cylinders
B/T	Buzzer/timer unit
CC	Range selected indicator lamps
CR4H	Powersplit relay (high)
CR4L	Powersplit relay (low)
DD	Powersplit selector button (gearstick mounted)
DP	Diode packs
EE	Air cylinder microswitches
F	Range/direction selector switch (column mounted)
H1	Neutral dump relay
H2	Speed inhibit relay
H3	Neutral dump latching relay
H4-H7	Range select relays
HM	Air outputs, high/medium range select
LR	Air outputs, low range/reverse select
PR18	Neutral select relay
PSH	Powersplit high/low solenoid
PSN	Powersplit neutral dump solenoid
S	Digital speedometer
* **X**	Clutch pedal microswitch

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Draft Control Valve

* **Note:** Dismantling of the draft control valve any further than the components shown in this manual is not recommended as it may disturb important settings that are built in during manufacture.

Solenoids

Machines with Non-Serviceable (Square X-section) Solenoids (View A)

Dismantling and Assembly

The numerical sequence (**A1**, etc) shown on the illustration is intended as a guide to dismantling for inspection and cleaning etc.

For assembly the sequence should be reversed.

* **Note:** If the solenoid valve **A2** is faulty it is necessary to fit a new spool section complete as there is no successful means of calibrating replacement solenoids.

Machines with Replaceable (Circular X-section) Solenoids (View B)

Note: Solenoids **B2** can be renewed without the need for recalibration. Simply follow the dismantling sequence.

The numerical sequence (**B1**, etc.) shown on the illustration is intended as a guide to dismantling.

Note: Disturbance of pressure tube **B8** will result in loss of factory calibration.

For assembly the sequence should be reversed.

When Dismantling

The assembly comprising items **B1**, **B3**, **B4**, **B5** should be removed intact to release solenoid **B2**. Check protective cap **B3**, sealing ring **B4** and 'O' ring **B5** for damage and renew if necessary.

Having removed solenoid **B2**, if there is evidence of hydraulic oil leakage onto pressure tube **B8**, remove items **B6** and **B9** and renew 'O' ring **B9**. Otherwise do not disturb.

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Assembly (continued)

9 Fit valve **32** onto the stem **37** and pass the stem through the inlet valve seat **34**. Fit the valve spring **36** over the stem and pass the valve guide **38** over the end of the stem. Depress the valve guide **38** against the spring and fit valve **39** to the stem.

10 Insert the plunger return spring **35** and valve assembly into the housing **49**.

11 Place plug **31** into the housing **49** after fitting the plug 'O' ring **30**. Fit washer **29** and circlip **28** into the housing.

12 Fit the gaiter **27** onto the push rod **24** and ensure that the gaiter is so positioned that it will not be overstretched when the rod is moved through its full stroke. Secure the gaiter with clip **26.**

13 Fit the end of the push rod **24** into the hydraulic piston **12** until the retaining clip **25** locates in the machined recess in the piston.

14 If the yoke **22** has been removed, refit it to the end of the rod **24** into its previously marked position and secure with locknut **23**.

Note: Check the length of rod **24** from the centre of the hole in yoke **22** to the face of the valve housing **49**. The measurement should be 206.5 to 209.5 mm (8.13 to 8.25 in).

15 Fit the exhaust diaphragm assembly **46** and **48** and secure with circlip **47**.

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Removal and Replacement

There are three types of propshaft coupling, two of which, **A** and **B**, are illustrated opposite. The third, type **C**, is described below. Also illustrated opposite is the propshaft layout showing the type of coupling at each location.

Removal

⚠ WARNING

Make the machine safe before getting beneath it. Do the following: Park on level ground. Engage the parking brake. Lower any mounted implements to the ground. Stop the engine, remove the starter key, disconnect the battery. Chock the wheels.

13-3-1-1

Coupling Type A

1 Mark the yoke end **3** and mating flange **4** to ensure correct positioning on reassembly. Remove bolts **1** and self locking nuts **2.**

2 Lower the end of the shaft until the yoke end **3** is clear of the flange.

Coupling Type B

1 Mark both sides of the coupling to ensure correct positioning on reassembly. Remove bolts **5,** washers **6** and straps **7.**

2 Lower the end of the shaft clear of yoke **8.**

Coupling Type C (not illustrated)

1 This has a yoke end with sliding splines which should be marked to ensure correct positioning on reassembly. After disconnecting the other end of the shaft, slide the splined yoke off the mating shaft.

Replacement

Lay each propshaft on a flat surface to check that both ends are exactly on the same plane, as shown at **X.** The yokes must **not** be at right-angles (as at **Y**) or at an intermediate angle (as at **Z**). If necessary, separate the two halves of the shaft and re-align.

Replacement is basically the reverse of the removal procedure but ensure match-marks are aligned (see Step 1 in **Removal**).

On Type **B** couplings, lightly grease the insides of straps **7** before assembly and use new bolts **5** and washers **6.**

Tighten nuts **2** and bolts **5** to a torque of 75 - 85 **Nm** (55.3 - 62.7 lbf ft, 7.65 - 8.7 kgf m).

On Type **C**, grease the splines before fitting.

Note: The rear PTO propshaft must be fitted with the sliding joint at the axle end to prevent the possibility of fouling when the limit of suspension travel is reached.

Thoroughly purge all universal joints with grease. If any bearing fails to purge, move the shaft from side to side and then purge. This allows greater clearance on the thrust end of the bearing that is not purging. Wipe away any excess grease.

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Low Pressure Warning Lights On

CHECK		ACTION
1	Are all three warning lights on?	YES: Check 2. NO: Check 4.
2	Is there a leak between the compressor and the circuit protection valve?	YES: Rectify leak. NO: Check 3.
3	Is air continually pumping from air dryer/unloader valve exhaust?	YES: Renew defective air dryer/unloader valve. NO: Strip and examine compressor.
4	If only one light is on, pressure test relevant tank. Is pressure OK?	YES: Renew defective low pressure switch. NO: Check 5.
5	Drain air from complete system. Recharge. Does fault still exist?	YES: Renew circuit protection valve. NO: System now OK.

Service Brakes Poor

CHECK		ACTION
1	Do disc pads have a minimum of 3 mm (0.12 in) friction material?	YES: Check 2. NO: Renew pads (in complete axle sets).
2	Do both brake fluid reservoirs have adequate fluid?	YES: Check 3. NO: Top up and check for leaks.
3	Have brakes been bled?	YES: Check 4. NO: Bleed brakes.
4	Fit a gauge first to **TP1** and then to **TP2**. Does the gauge indicate that air system pressure is reaching the footbrake valve.	YES: Check 5 NO: Check that air system pressure is reaching the circuit protection valve. If not check for a leak in the circuit from the compressor. If pressure is reaching the circuit protection valve check the valve for faults.
5	Are air/hydraulic actuators functioning?	YES: Check 6. NO: Strip and inspect actuator(s).
6	Is there evidence of oil leakage at the failure conscious pressure relief valve?	YES: Fit a new valve. NO: Bleed brakes.

Poor Front Brakes, Good Rear Brakes

CHECK		ACTION
1	Fit a gauge to **TP1**. Charge system. Does **TP1** reach system pressure?	YES: Check 2. NO: Check for leaks or faulty circuit protection valve.
2	Operate footbrake. Does the front air/hydraulic actuator function?	YES: Check 3. NO: Check footbrake valve.
3	Is there evidence of oil leakage at the failure conscious pressure relief valve?	YES: Fit a new valve. NO: Check 4.
4	Has the front hydraulic circuit been bled?	YES: Check operation of the caliper and serviceability of the brake friction pads. NO: Bleed front hydraulic circuit.

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* Front Axle Pressure Equalising Relief Valve (Machines to Serial No. 737000)

Operation 1

When no steering effort is being exerted oil is trapped in the steering ram circuit, i.e. there are no oil pressures at ports **1** and **2**. Check valve **B** and main spool **E** are held together by springs **C** and **L** respectively to seal off aperture **A** and hence port **2**. Spring **H** holds ball **J** against seat **G** to seal off aperture **K** and hence port **1**.

Operation 2

In a left turn situation pressurised oil enters the valve from the steering unit through port **2**. Via aperture **A** oil pressure forces check valve **B** downwards against spring **C** to allow full flow through port **1** into the rod side of the steering ram.

Operation 3

In a right turn situation pressurised oil enters the valve through port **1**. Oil passes through orifice **D** in main spool **E** and orifice **F** in seat **G**. When the pressure at the upper end of orifice **F** overcomes the pressure of relief valve spring **H**, ball **J** lifts off seat **G** to allow a pilot feed via aperture **K** to port **2**. When this situation occurs there is a pressure drop across main spool **E**. This drop allows the pressurised oil from port **1** to overcome the pressure of spring **L**. As a result spool **E** lifts off its seat to allow oil to flow from the rod side of the steering ram through aperture **A** and port **2** back to the steering unit.

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