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CLUTCHES — SECTION 18

Clutches — Chapter 1

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TRANSMISSION SYSTEM — SECTION 21

Semi-Powershift Transmission (Range Command) — Chapter 1

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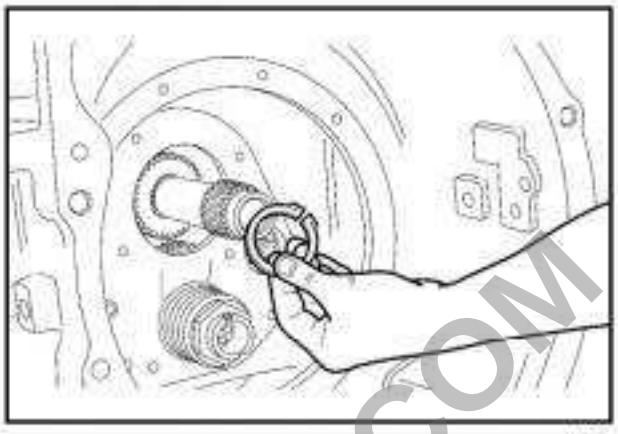
Power Command 30 and 40 kph Transmission, 120 - 155 Models (Full Powershift) — Chapter 2

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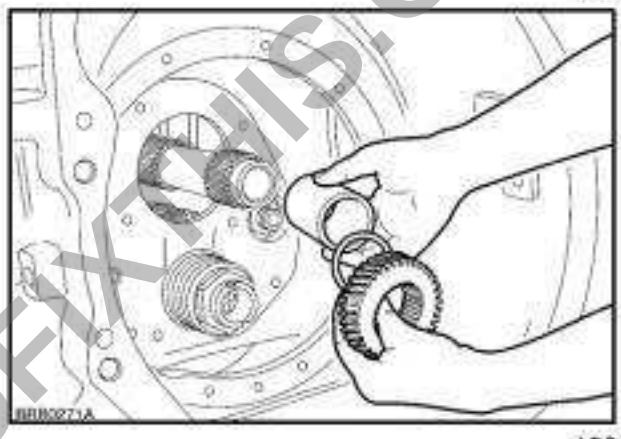
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9. Remove the circlip from the front end of the upper speed shaft.



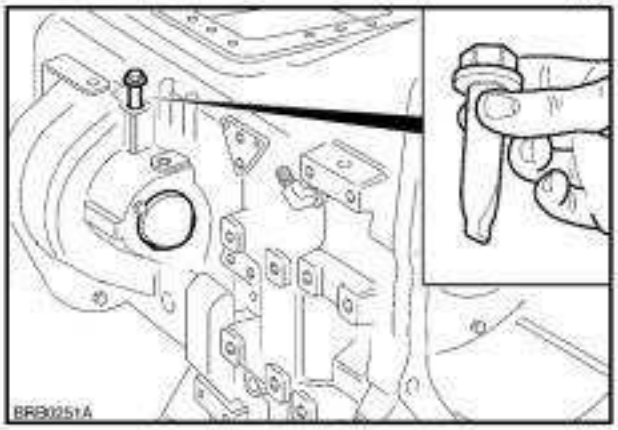
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10. Remove the gear, shim and spacer from the upper speed shaft.



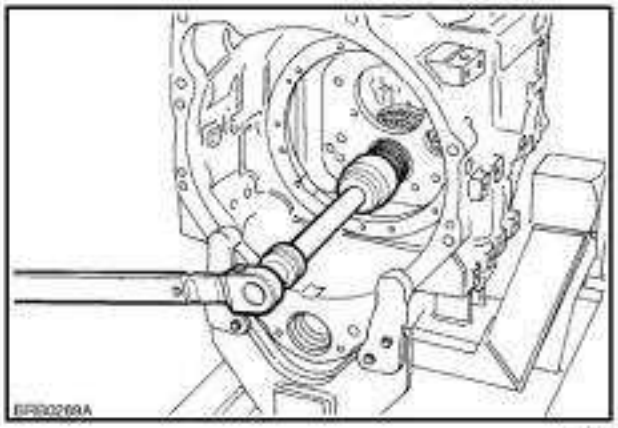
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11. Ensure that the transmission is still locked using the special tool in the reverse clutch speed sensor hole.



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12. Release the tabs on nut at the front end of the lower speed shaft and unscrew the nut using a 60mm socket. Remove the holding tool.

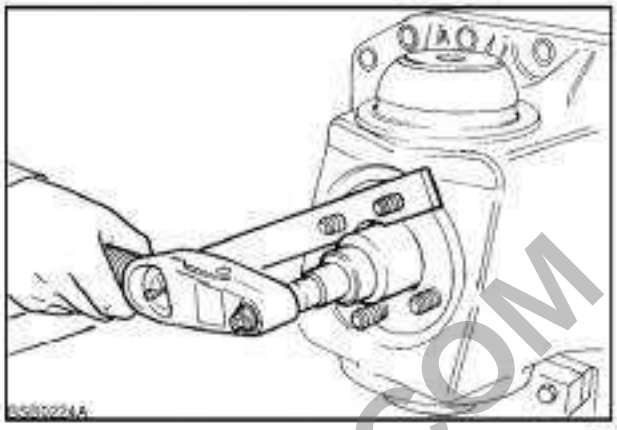


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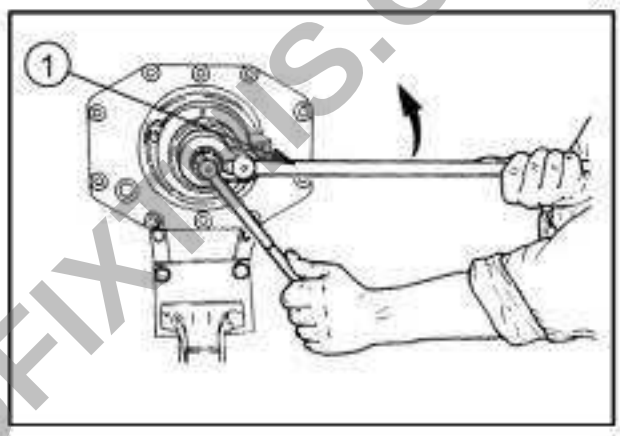
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3. Supersteer and Suspended Axle Pinion nut removal. Prevent rotation with suitable lever (protect threads).



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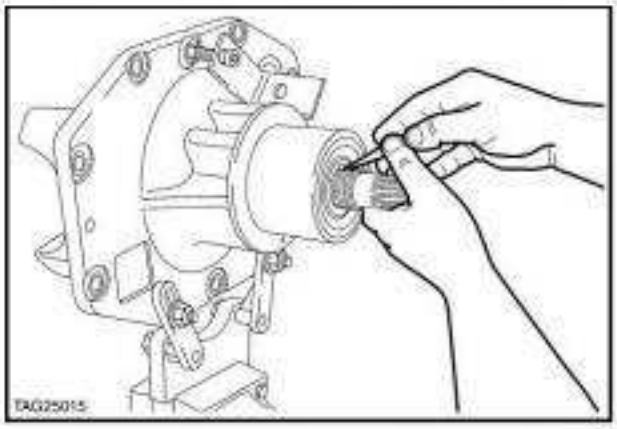
4. Unscrew the nut using wrench **293878** class III axles or tool **293879** class IV axles, (1) while holding the bevel drive pinion shaft against rotation with the locally fabricated tool.



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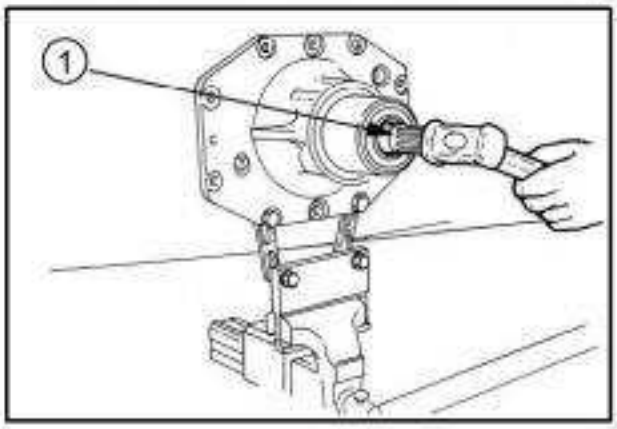
5. Remove the locking ball from the sleeve.

NOTE: *Not applicable for Supersteer or Suspended Axle Assemblies.*



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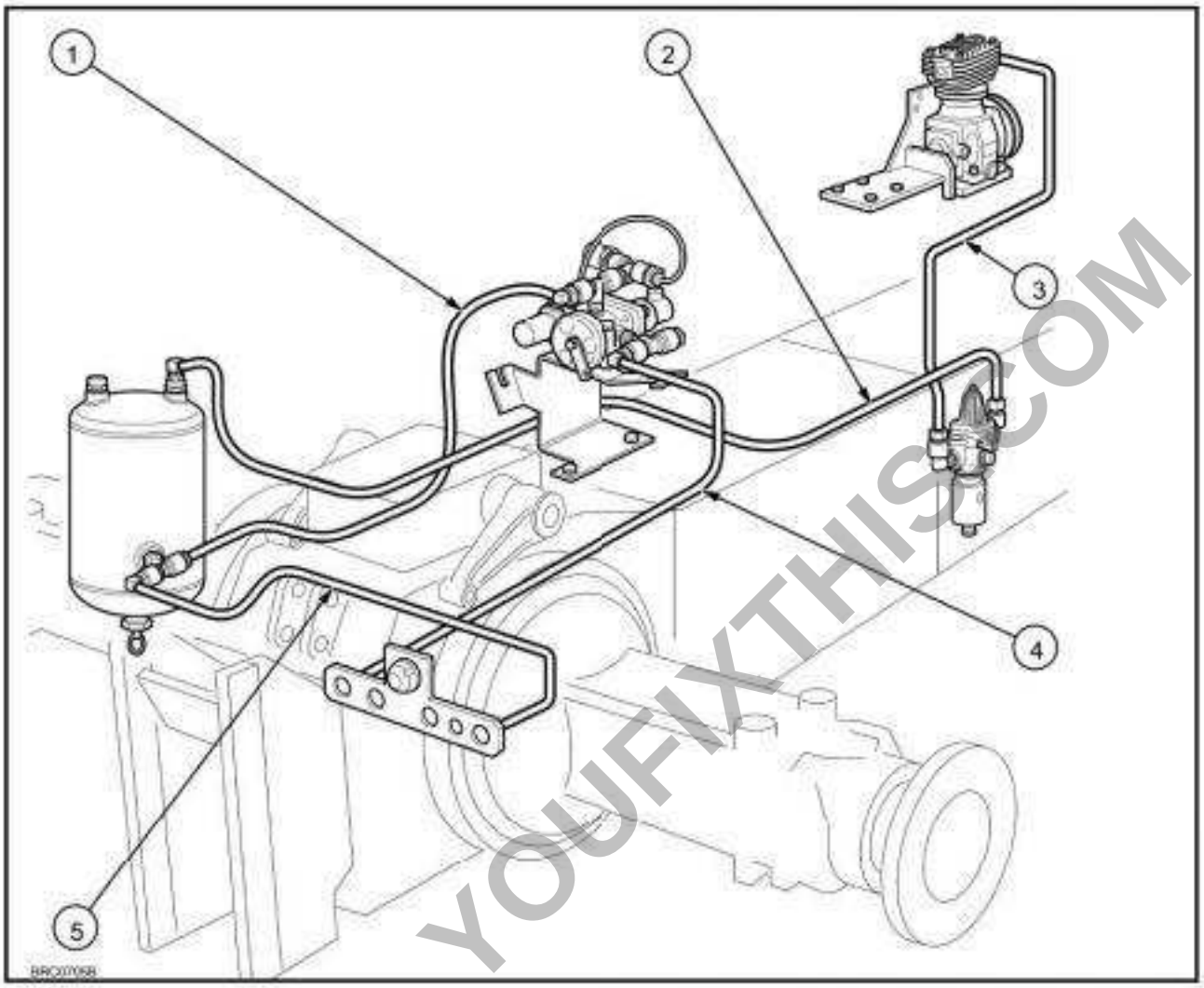
6. Withdraw the pinion shaft (1) from the rear of the casing and remove the spacer, the adjustment shims and the bearing.



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6

Universal Air Brake – Tube Connections

1. Control valve to left hand reservoir tube
2. Unload valve to left hand reservoir tube
3. Compressor to unload valve
4. Yellow coupler tube
5. Red coupler tube

Universal Air Brake Option (Figure 5)

Brakes Disengaged

Air from the Compressor (1) is supplied to the Unload Valve (2) which regulates system pressure stored in the Reservoir (4).

This pressure is supplied to the trailer via the Red Supply Line (10) Coupler to disengage the brakes.

The air in the system also acts on the Pressure Sender Unit (13) which supplies a variable electrical signal to the Pressure Gauge (11) to indicate the pressure in the system.

If the pressure drops below specified limits, the sender incorporates a switch to illuminate the Warning Lamp (12).

Brakes Engaged

Operating the brake pedal closes the Brake Switches (15) which sends a signal to the Solenoid Valve (7). When energised this supplies air via the Pressure Regulator (8) to the Control Valve (6) as pilot pressure to initiate operation of the trailer's brakes via the Yellow Control Line Coupler (9).

As the tractor's brakes are applied, Hydraulic Pressure from the Master Cylinders (12) is transferred via the Brake Logic Valve (13) to the Control Valve (6) to progressively increase pressure in the Yellow Control Line (9) to the trailer's brake control valve to engage the brakes in line with the tractor brakes.

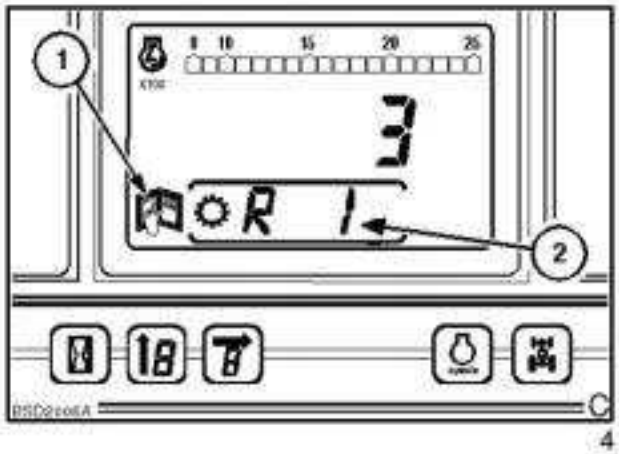
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Electro–Hydraulic Remote Valve Fault Codes

EHR Errror Codes.	(DIC Bottom Centre Window)
Error Code	**Description**
R1	EHR Lever 1 not calibrated
R2	EHR Lever 2 not calibrated
R3	EHR Lever 3 not calibrated
R4	EHR Lever 4 not calibrated
R15	Valve 1 – spool travel short or spool travel excessive or open centre not reached
R25	Valve 2 – spool travel short or spool travel excessive or open centre not reached
R35	Valve 3 – spool travel short or spool travel excessive or open centre not reached
R45	Valve 4 – spool travel short or spool travel excessive or open centre not reached
R14	EHR Valve 1 – Supply undervoltage/overvoltage or output stage faulty or transducer faulty or spool neutral error or spool not neutral error
R24	EHR Valve 2 – Supply undervoltage/overvoltage or output stage faulty or transducer faulty or spool neutral error or spool not neutral error
R34	EHR Valve 3 – Supply undervoltage/overvoltage or output stage faulty or transducer faulty or spool neutral error or spool not neutral error
R44	EHR Valve 4 – Supply undervoltage/overvoltage or output stage faulty or transducer faulty or spool neutral error or spool not neutral error
R17	Valve 1 – No communication between EHR and Control module
R27	Valve 2 – No communication between EHR and Control module
R37	Valve 3 – No communication between EHR and Control module
R47	Valve 4 – No communication between EHR and Control module
R13	Valve 1 – Can messages received by the EHR are corrupted or missing
R23	Valve 2 – Can messages received by the EHR are corrupted or missing
R33	Valve 3 – Can messages received by the EHR are corrupted or missing
E43	Valve 4 – Can messages received by the EHR are corrupted or missing

Electro–Hydraulic Fault code display in Digital instrument cluster.



4

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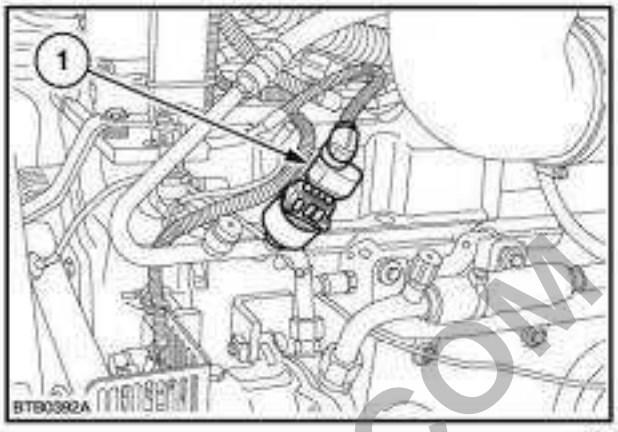
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COMPRESSOR HIGH LOW CUT–OUT SWITCH

1. With the engine 'Off' check continuity across the switch contacts, (1), Figure 52. If the switch shows 'Open Circuit' replace as detailed below.

NOTE: *The switch can be replaced without discharging the system.*

2. Remove switch by unscrewing from self sealing schrader valve.
3. Replace with new switch and connect the harness.



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CAB AIR FILTERS

1. Before servicing the filters, switch off the blower and close the roof hatch, all windows and one door. Slam the final door closed and the resulting back pressure will dislodge most of the loose dirt from the underside of the filters.
2. Remove filter element(s), Figure 53 and clean by blowing with compressed air not exceeding 2 bar (30 lbf/in^2).

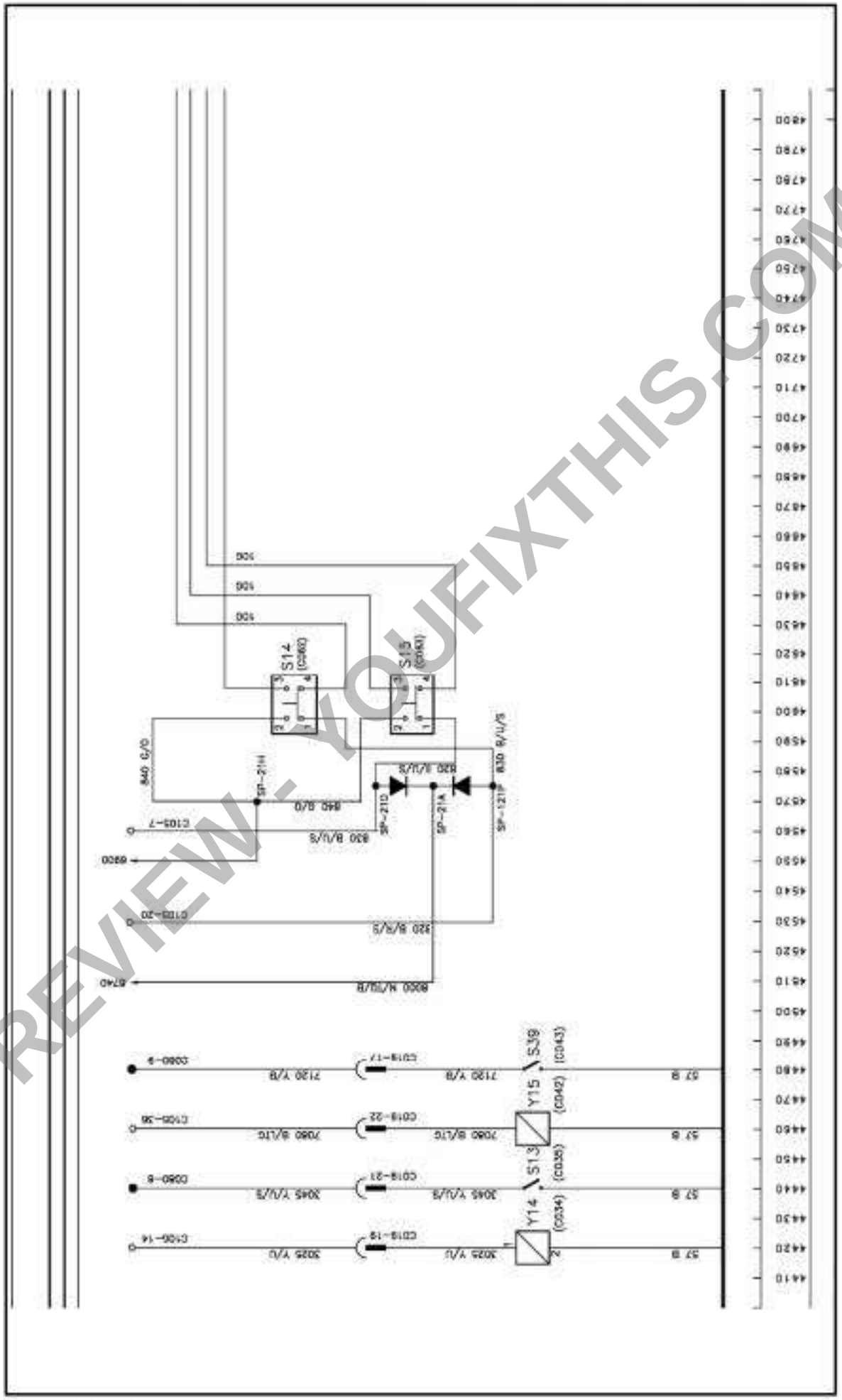
   Blow the dust from the upper surface through the element to the underside. Hold the nozzle at least 12 in (300 mm) from the element to prevent damage to the paper pleats.
3. Clean both filter chambers with a damp, lint free cloth.
4. Replace the filter elements with the rubber seal uppermost and re–install the covers.



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B. If error code F53/54 is still displayed, continue to step 9.

9. Check for a short to ground.

   A. Disconnect the secondary controller (CFPS) connector **C333**. With all of the above connectors disconnected, check between connector **C333** pin **18 (LN)** and **ground**. If a short to ground is indicated, repair or replace the harness as required.

   B. If a short to ground is not indicated, continue to step 10.

10. Check for a short to +Ve voltage.

    A. Turn the keystart ON. Measure between connector **C333** pin **18 (LN)** and **ground**. If a voltage is indicated, repair or replace the harness as required.

    B. If the harness is okay, download the correct level of software. If the fault re–occurs, remove and replace the secondary controller (CFPS).

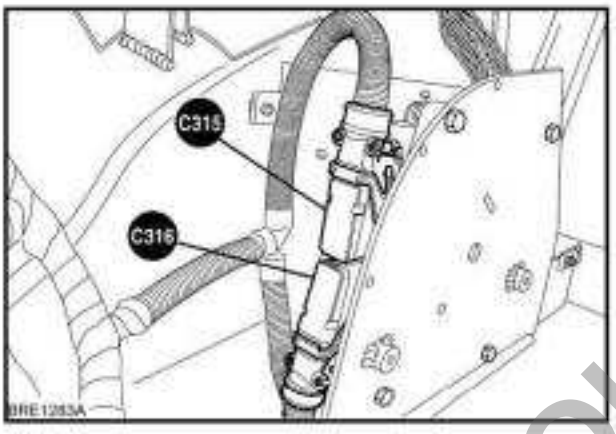
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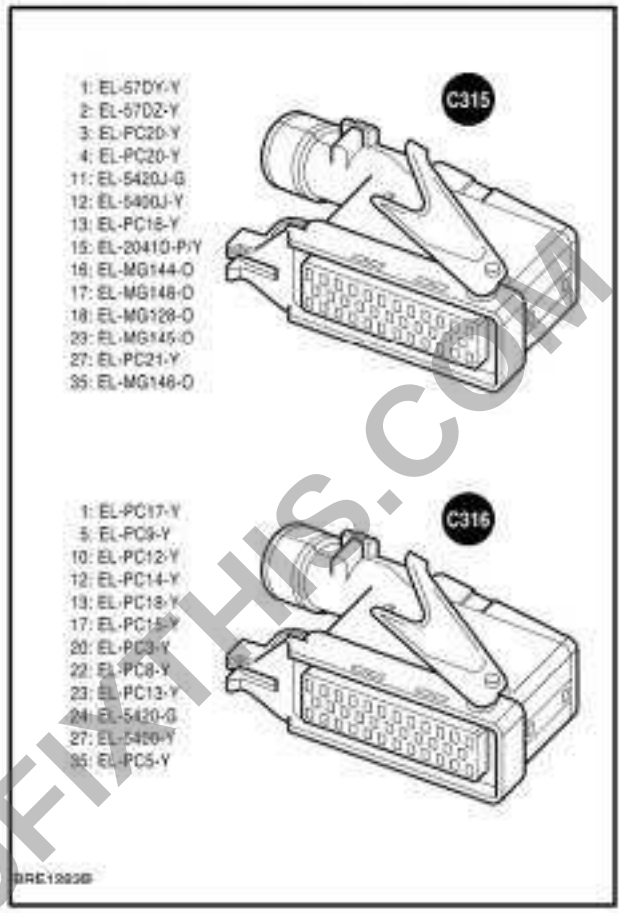
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PRIORITY (1 = Highest)	ERROR CODE	ERROR DESCRIPTION
35	P35	Fender mounted rear PTO switch open circuit error
36	P36	Rear PTO failure to start
37	P37	Rear PTO cab switch open circuit
38	P38	PTO Switch time out error
39	P39	PTO Management Switch Normally Open contact short circuit.
40	P40	Transmission and Vehicle Service software versions incompatible
41	P41	Not used

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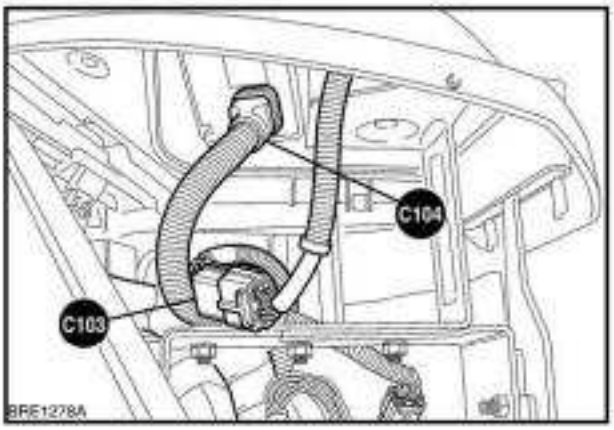
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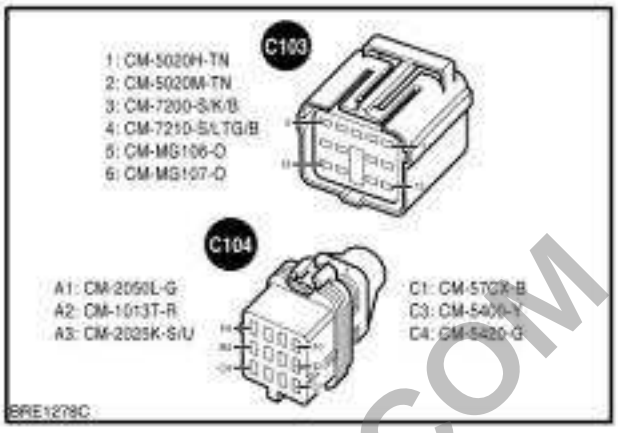


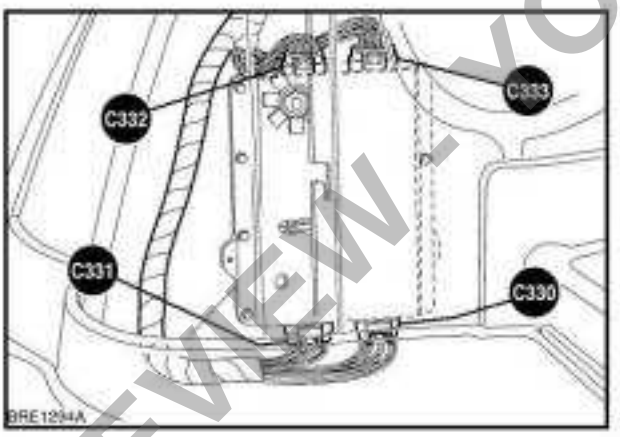


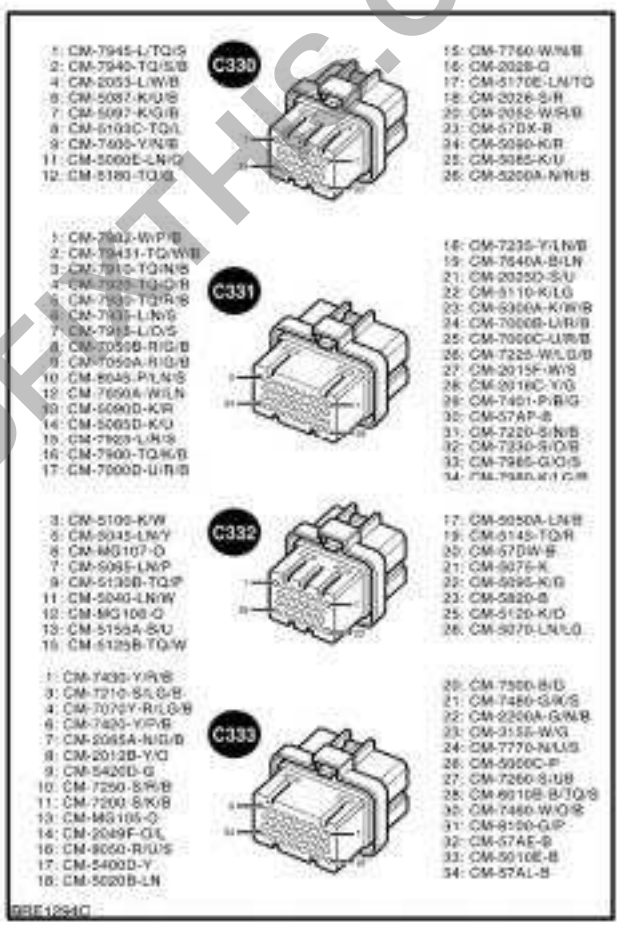
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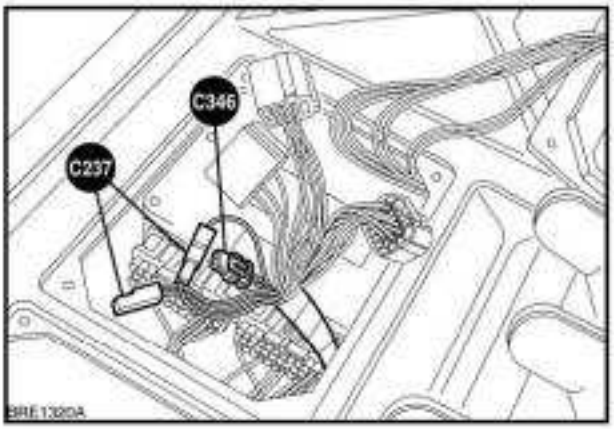


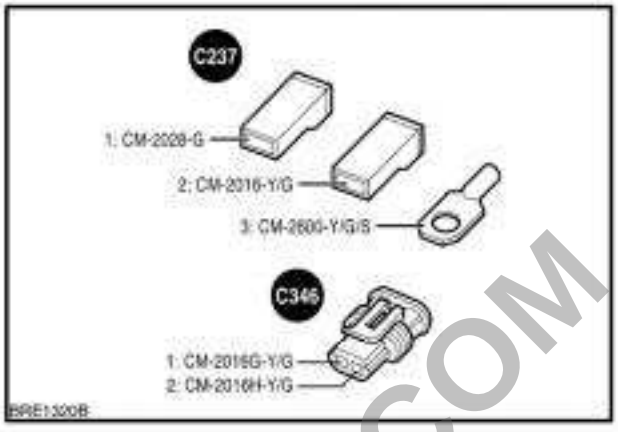


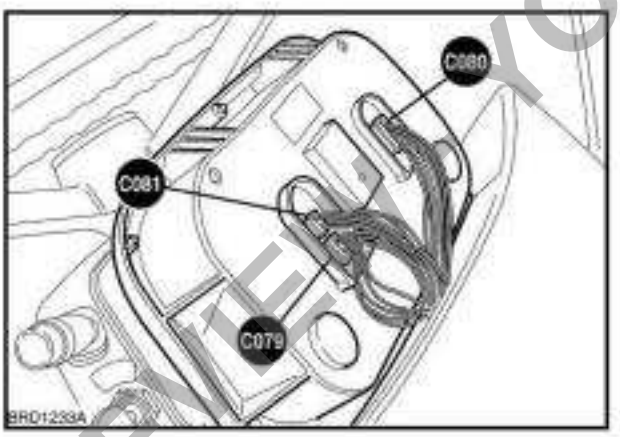


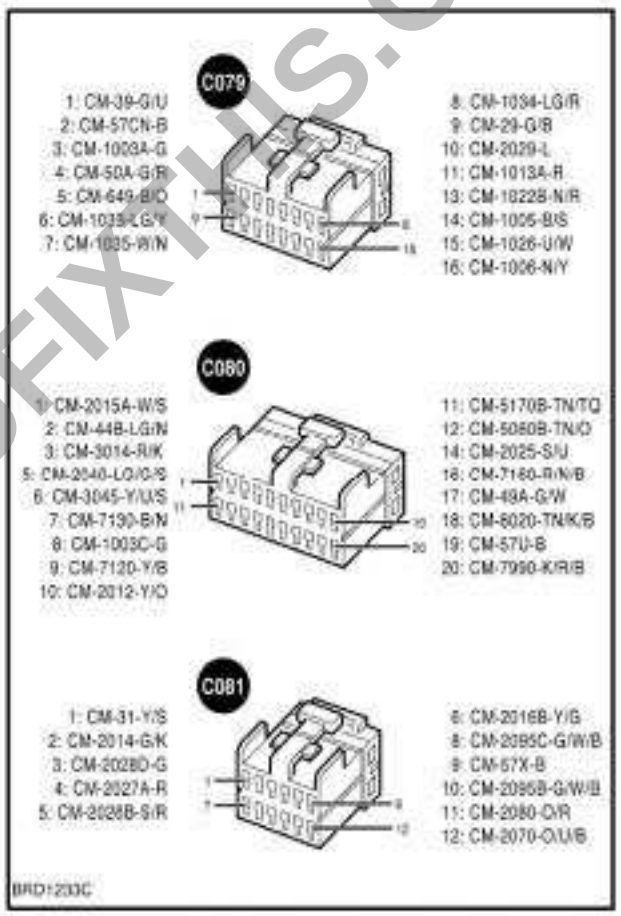
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ERROR CODE U09 – SUSPENSION IS STATICNARY DURING THE LOWERING COMMAND IN THE AUTO CALIBRATION PROCEDURE

ERROR CODE U10 – SUSPENSION IS UNABLE TO REACH THE MINIMUM HEIGHT WITHIN 25 SECONDS

Possible failure modes:

1. Faulty connector
2. Faulty high pressure hydraulic circuit
3. Faulty solenoid
4. Mechanical fault with front suspension
5. Faulty harness

Solution:

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

1. Check the lowering solenoid connector **C249** (identified with a green band) and the front suspension connector **C248**.

   A. Ensure the connector is connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.

   B. If the connector is okay, continue to step 2.

2. Check the hydraulic lift and remote valves are operating correctly.

   A. If they are not working correctly, check the high pressure hydraulic circuit.

   B. If they are working correctly, continue to step 3.

3. Check for an open circuit.

   A. Turn the keystart OFF. Disconnect connector **C249** and the general control module (GCM) connector **C242**. Check between connector:

   C249 pin **1 (O/N/S)** and **C242** pin **26 (O/N/S)**

   C249 pin **2 (O/L/S)** and **C242** pin **21 (O/L/S)**

   If an open circuit is indicated, repair or replace the harness as required.

   B. If the harness is okay, continue to step 4.

4. Check for damage.

   A. Inspect the front suspension for any mechanical faults or a hydraulic cylinder fault. Check the potentiometer for damage. Repair or replace as required and perform the auto calibration procedure (ACP).

   B. If all of the above are okay, continue to step 5.

5. Check the ACP.

   A. Disconnect the implement and perform the ACP.

   B. If the error re–occurs, continue to step 6.

6. Check the solenoid valves.

   A. Depressurise the suspension system, and interchange the raise and lower solenoid valves. Perform the ACP, if the fault now occurs on the raising cycle, depressurise the suspension system and replace the solenoid valve assembly.

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ERROR CODE 57 – EDC MICROPROCESSOR FAILURE

Possible failure modes:

1. Faulty harness
2. Faulty general control module (GCM)

Solution:

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

1. Check fuse 12.

   A. If a fault is indicated with fuse 12, continue to step 2.

   B. If the fuse is okay, continue to step 4.

2. Check for a short to ground.

   A. Disconnect the general control module (GCM) **C127**. Check between connector **C127** pin **29 (N/R/B)** and **ground**. If a short to ground is indicated, repair or replace the harness as required and replace the fuse.

   B. If the harness is okay, continue to step 3.

3. Check for an intermittent short circuit.

   A. Replace fuse 12. Turn the keystart OFF and ON. If the error code is still displayed, download the correct level of software. If the fault re–occurs, remove and replace the general control module (GCM).

   B. If the error code is not displayed, check for an intermittent short circuit. If an intermittent short circuit is indicated, repair or replace the harness as required.

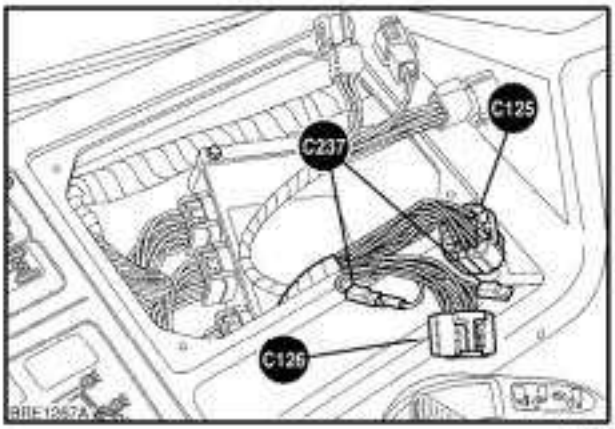
4. Check for an open circuit.

   A. Turn the keystart OFF. Disconnect the general control module (GCM) connector **C127**. Check between connector **C127** pin **29 (N/R/B)** and fuse 12. If an open circuit is indicated, repair or replace the harness as required.

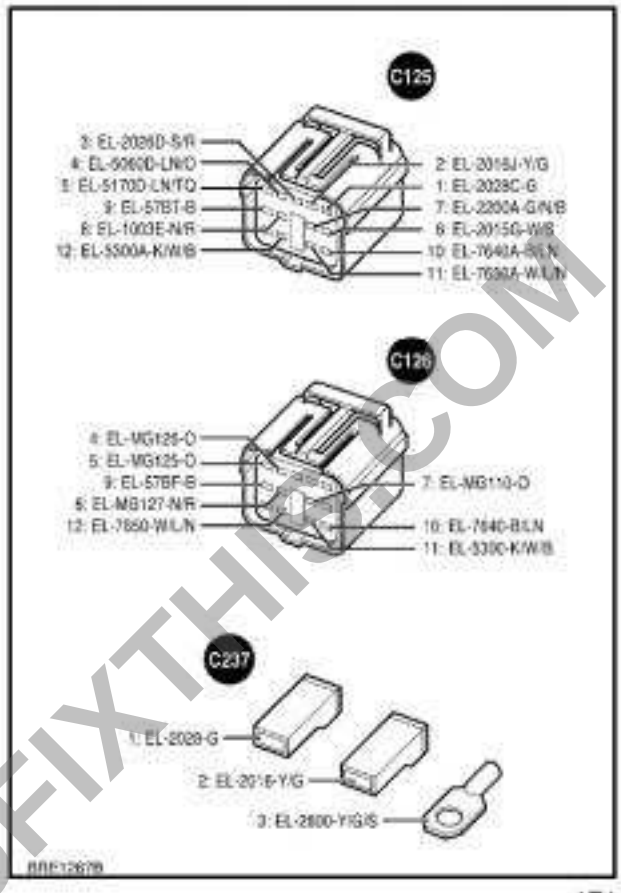
   B. If the harness is okay, download the correct level of software. If the fault re–occurs, remove and replace the general control module (GCM).

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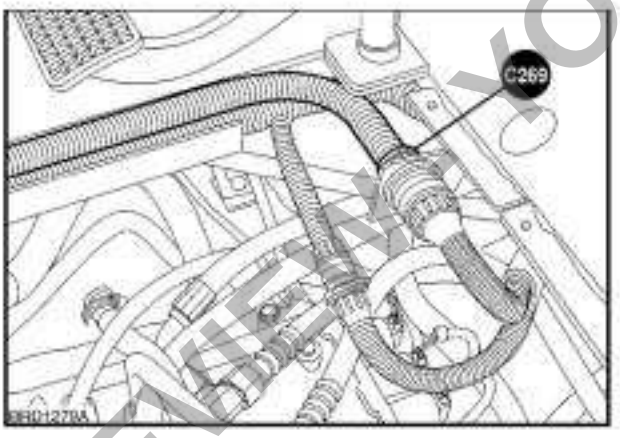
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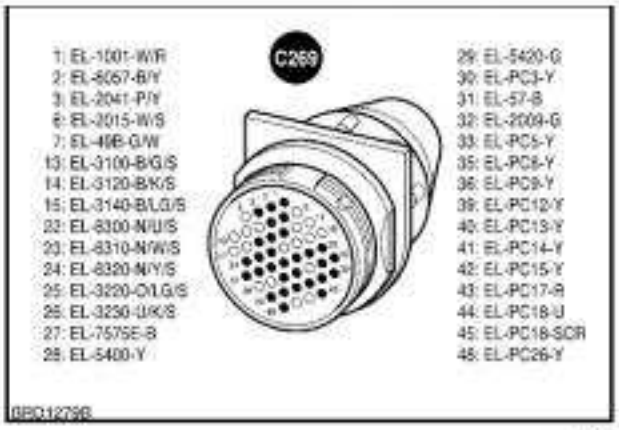


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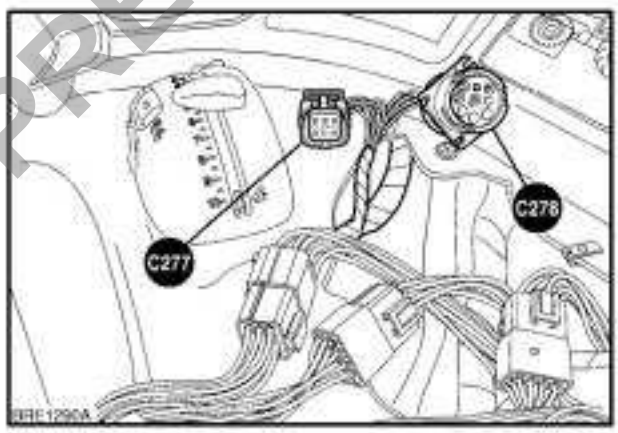


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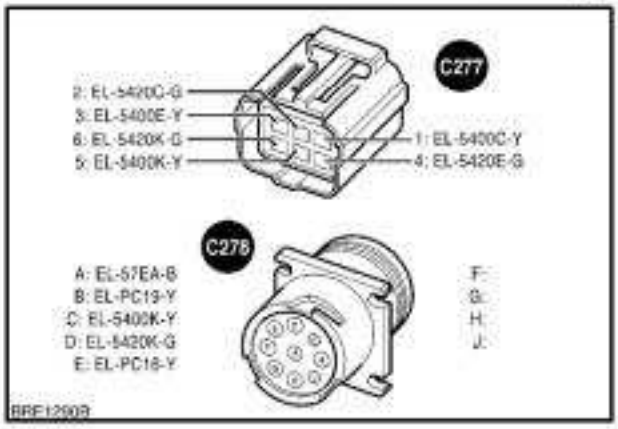




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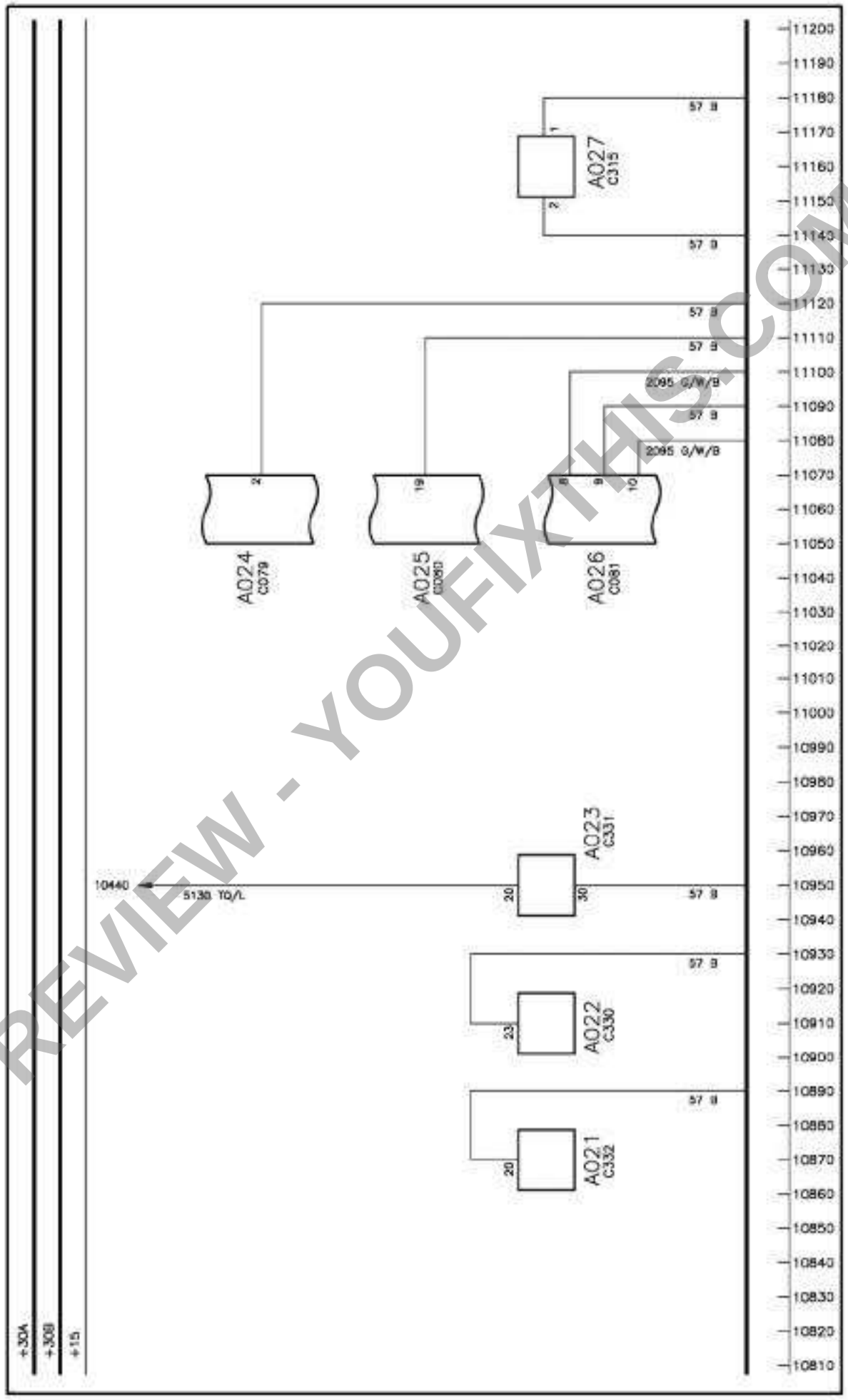


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INDICATORS AND HAZARDS 3
Line 7610-8000

F11 Horn/Headlight Flasher/Roof Beacon Fuse - 30A

H20 Rear Lamp RH Fender
H21 Worklamp RH Fender
H22 RH Side Lamp
H33 RH Licence Plate Lamp

S43 PTO Fender Switch RH

WIRE COLOUR CODES							
B	Black	R	Red	LTG	Light Green	K	Pink
N	Brown	O	Orange	U	Blue	W	White
TN	Light Brown	Y	Yellow	TQ	Turquoise		
S	Slate	G	Green	L	Purple		

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ERROR CODE F84 - PRESSURE INDICATED ON FORWARD CLUTCH PRESSURE SWITCHES WHEN THE CLUTCH SOLENOIDS ARE OFF

Effects:

Transmission disabled.

Possible failure modes:

1. Faulty pressure switch
2. Faulty solenoid
3. Faulty harness
4. Faulty secondary controller (CFPS)

Solution:

NOTE: *When the cause of the error code has been rectfied, clear the error code and test the system for normal operation.*

1. Check the pressure switches.

   A. Disconnect the pressure switch connectors **C243**, **C244**, and **C245**. Check across the pins of each switch in turn, if an open circuit is not indicated, remove and replace the faulty pressure switch.

   B. If the switches are okay, continue to step 2.

2. Check for a short to +Ve voltage

   A. Turn the keystart ON. Measure the voltage between connector:

   C243 pin **2 (N/U/S)** and **ground**

   C244 pin **2 (N/U/S)** and **ground**

   C245 pin **2 (N/U/S)** and **ground**

   If a voltage is indicated, repair or replace the harness.

   B. If the harness is okay, continue to step 3.

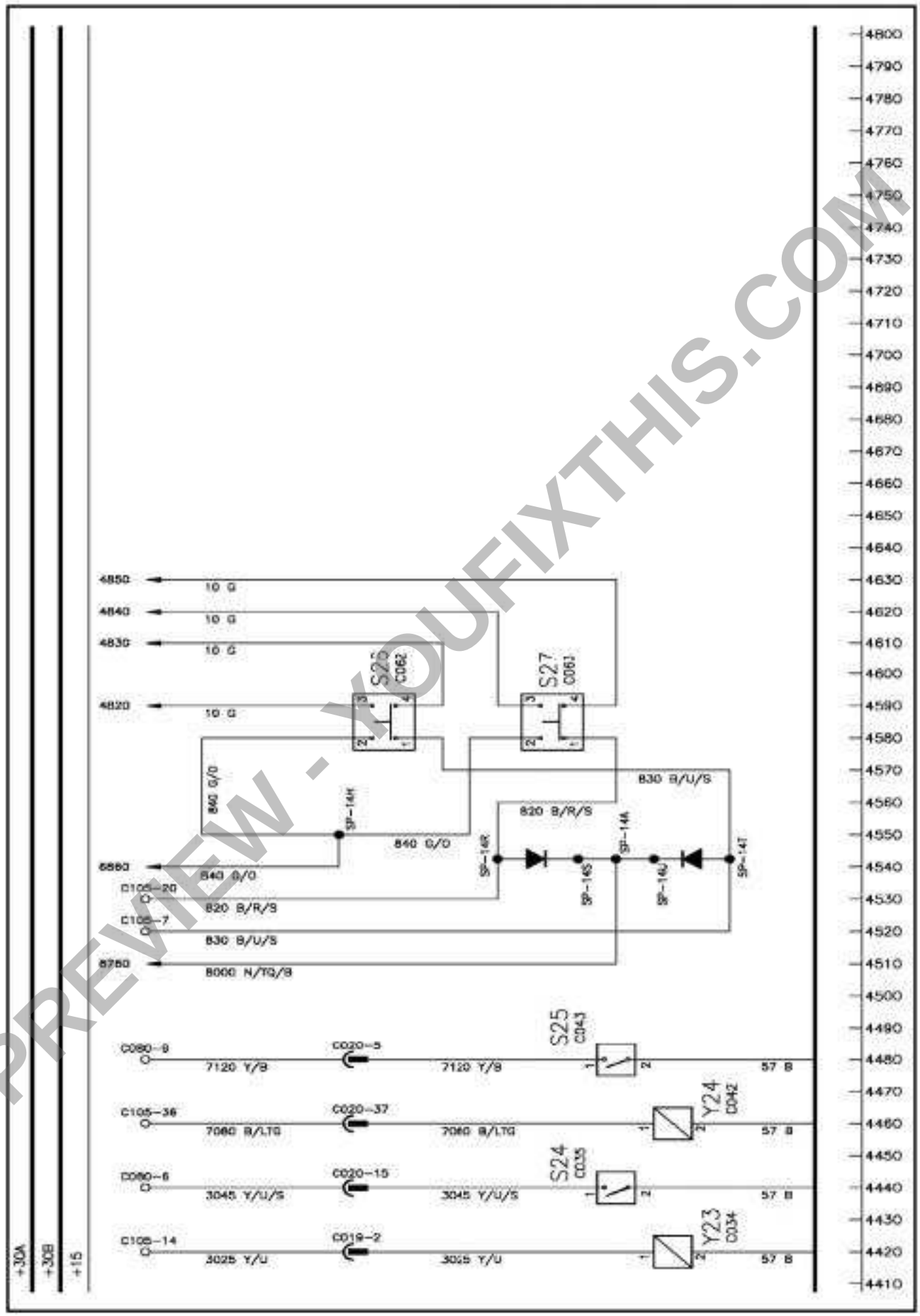
3. Check the clutch pack pressures.

   A. Connect connectors **C243, C244** and **C245**. Start the engine. Shuttle lever in neutral. If a pressure is indicated at any of the clutch packs. Remove and replace the faulty solenoid.

   B. If no pressure is indicated, download the correct level of software. If the fault re-occurs, remove and replace the secondary controller (CFPS).

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ERROR CODE T3C - SOLENOID VALVE, DATA VALID BUT BELOW NORMAL RANGE
ERROR CODE T3D - SOLENOID VALVE, DATA INCORRECT
ERROR CODE T3E - SOLENOID VALVE, DATA VALID BUT ABOVE NORMAL RANGE

SERVICE TOOL ERROR CODE - 3610

Cause:

The solenoid valve in the pump control unit (PCU) is permanently energised.

Effects:

Engine shut-down.

Possible failure modes:

1. Faulty connector
2. Faulty engine shut-down relay K5
3. Faulty harness
4. Faulty pump control unit (PCU)

Solution:

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

1. Check the pump control unit (PCU) connector **C273**, front main harness connector **C269**, and the engine control module connector **C315** and **C316**.

   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.

   B. If the connectors are okay, continue to step 2.
2. Check the engine shut-down relay K5.

   A. Remove the engine shut-down relay K5 from connector **C312**. Measure the resistance between terminal **30** and terminal **87**. If a closed circuit is indicated, replace the relay.

   B. If the relay is okay, refit and continue to step 3.
3. Check for an open circuit.

   A. Disconnect connector **C273** and **C316**. Check between connector:

   C273 pin **5 (PC3-Y)** and **C316** pin **20 (PC3-Y)**

   C273 pin **6 (B)** and **ground**

   Wiggle the harness and the connectors to check for an intermittent circuit. If an open circuit is indicated, repair or replace the harness as required.

   B. If an open circuit is not indicated, continue to step 3.
4. Check for a short to ground.

   A. Check between connector:

   C273 pin **5 (PC3-Y)** and **ground**

   C273 pin **7 (2009-G)** and **ground**

   Wiggle the harness and the connectors to check for an intermittent circuit. If a short to ground is indicated, repair or replace the harness as required.

   B. If a short to ground is not indicated, continue to step 4.
5. Check for a short to +Ve voltage.

   A. Disconnect connector **C315**. Turn the keystart ON. Measure the voltage between connector:

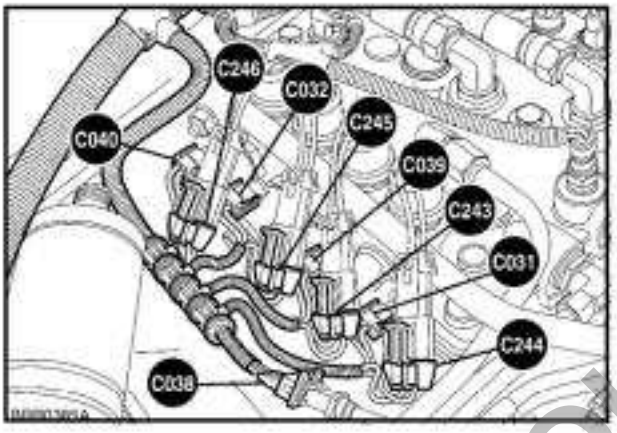
   C273 pin **5 (PC3-Y)** and **ground**.

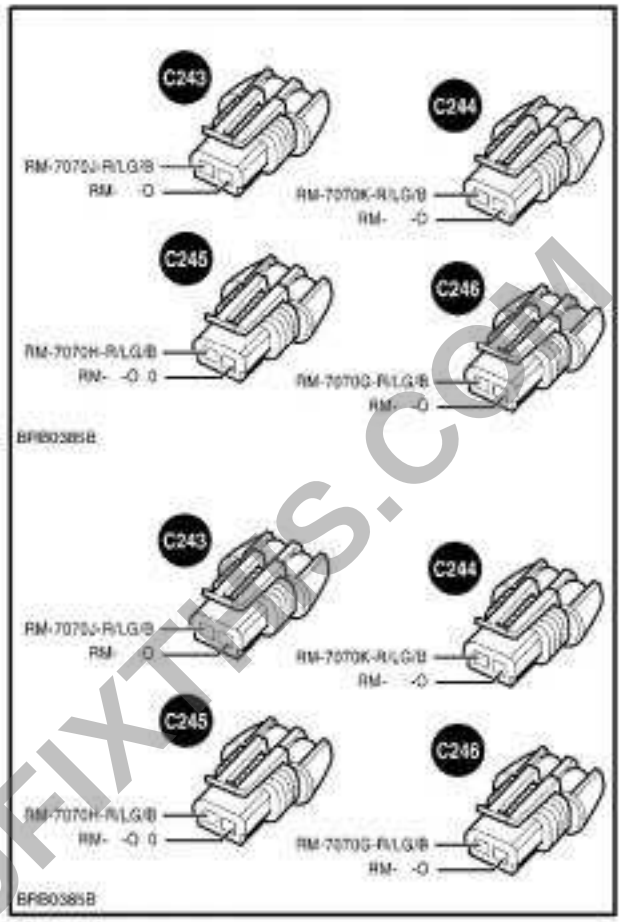
   C273 pin **7 (2009-G)** and **ground**

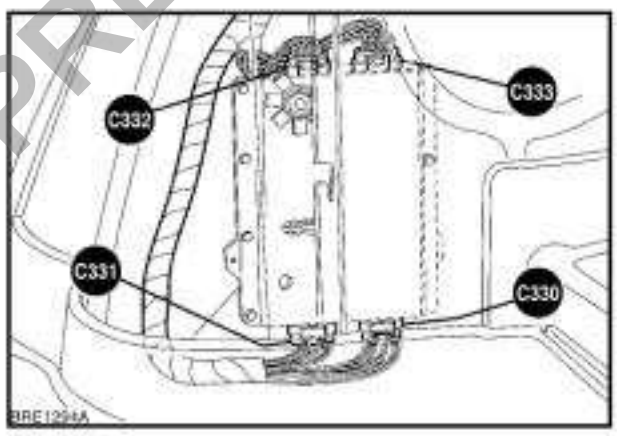
   C315 pin **18 (MG128-O)** and **ground**

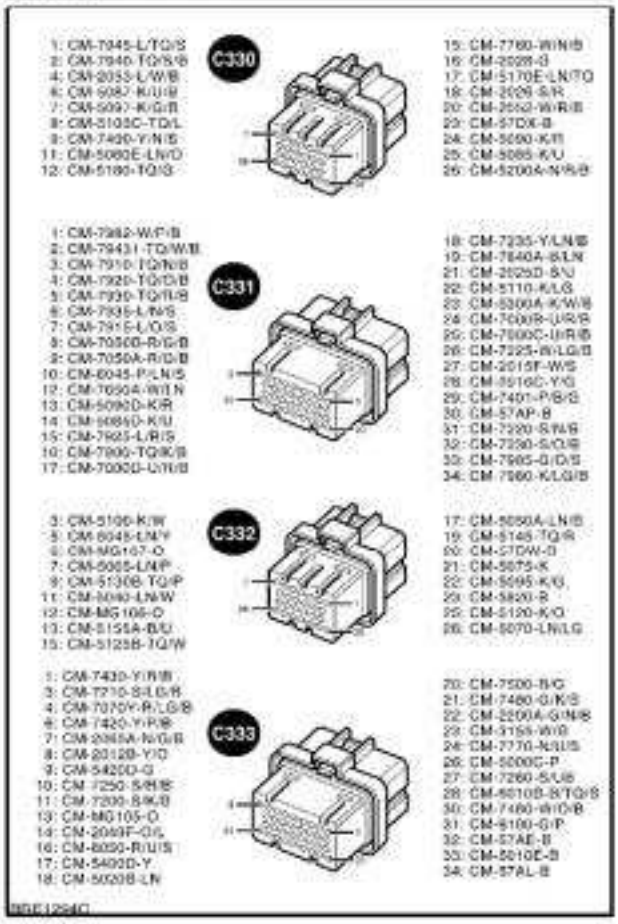
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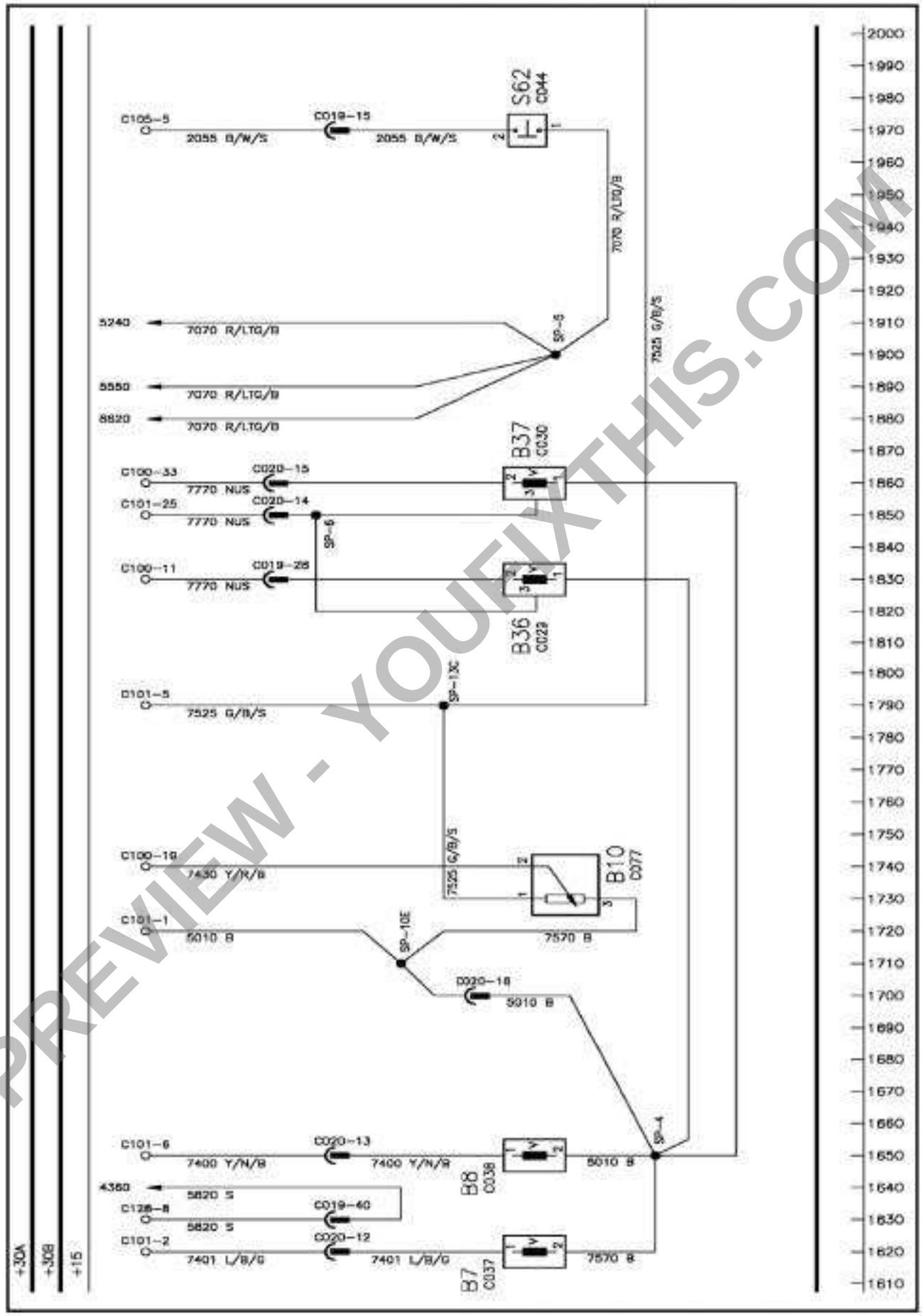






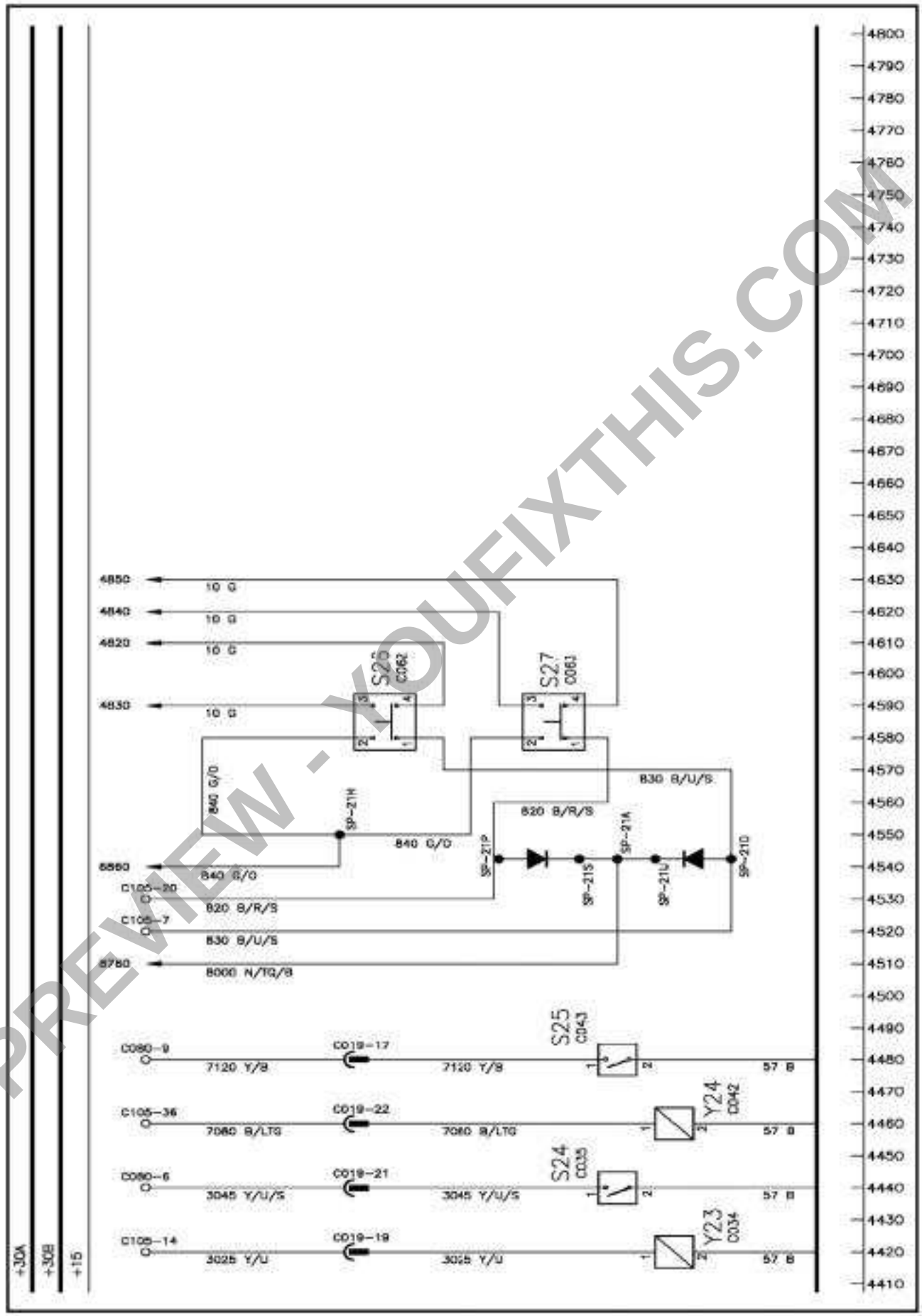
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ERROR CODE P15 - DIFFERENTIAL LOCK SOLENOID STUCK OFF

Possible failure modes:

1. Faulty solenoid
2. Faulty harness
3. Faulty electronic management unit

Solution:

NOTE: *When the cause of the error code has been rectfied, clear the error code and test the system for normal operation.*

NOTE: *Do not depress the brake pedals.*

1. Check for other error codes.

   A. Disconnect the differential lock solenoid connector **C042**. Turn the keystart ON. Select manual differential lock.

   If only error code P15 is being displayed, continue to step 2.

   B. If error codes P16 or P16 and P17 are displayed, continue to step 3.

2. Check for a short to ground.

   A. Turn the keystart OFF. Disconnect connector **C042** and the electronic management unit connector **C105**. Check between connector **C105** pin **36 (B/LTG)** and **ground**. If a short to ground is indicated, disconnect the harness connector **C019** and check between connector:

   C105 pin **36 (B/LTG)** and **ground**

   C042 pin **1 (B/LTG)** and **ground**

   to determine which harness is at fault. Repair or replace the harness as required.

   B. If the harness is okay, remove and replace the electronic management unit.

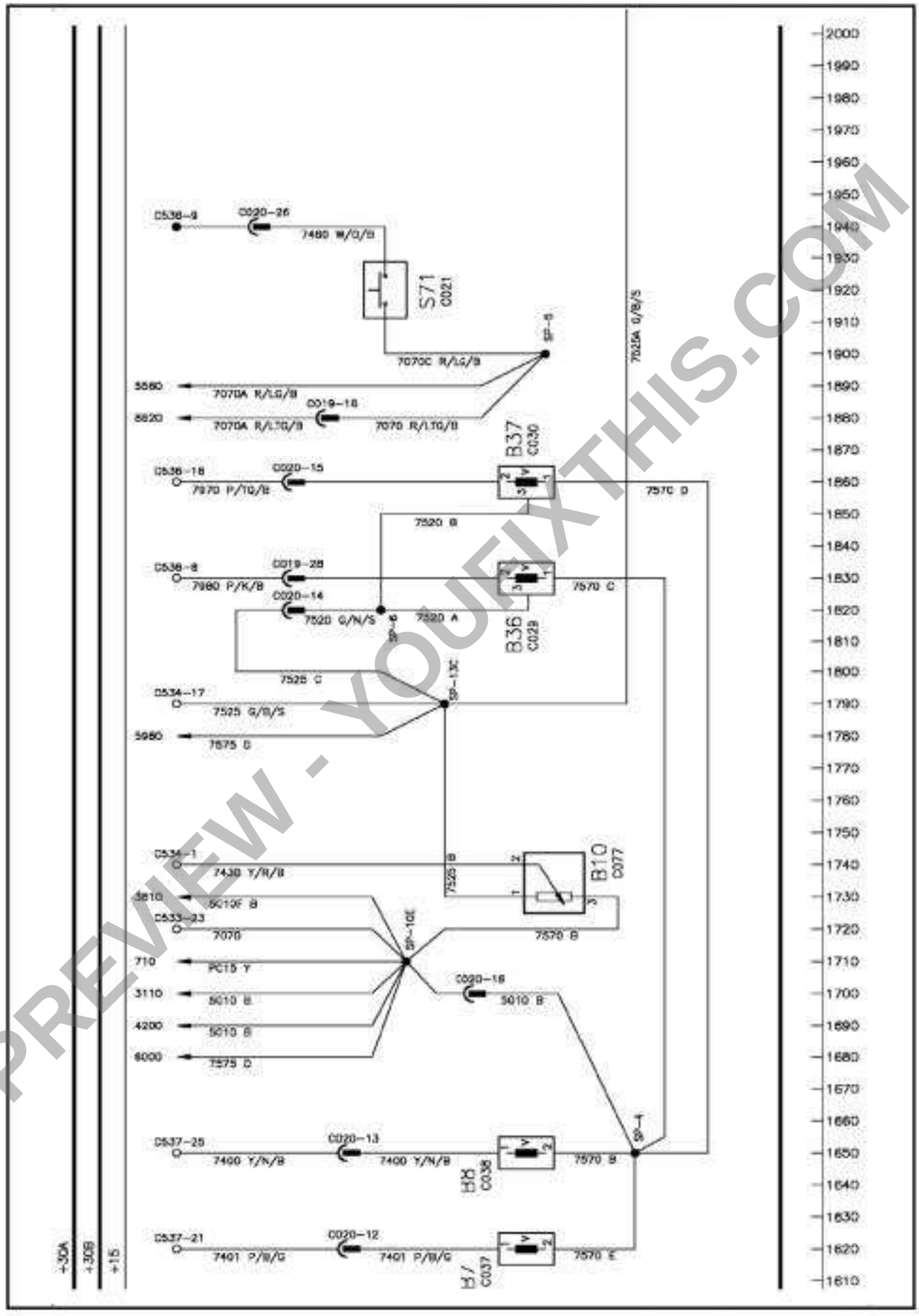
3. Check the differential lock solenoid.

   A. Measure the resistance between the solenoid terminals. If the resistance indicated is not between 5 - 11 Ohms, remove and replace the solenoid.

   B. If the solenoid is okay, remove and replace the electronic management unit.

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