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**Farmall 65C,
Farmall 75C,
Farmall 85C,
Farmall 95C
Tractors**

Repair


Vol. 1
87758598



**Farmall 65C,
Farmall 75C,
Farmall 85C,
Farmall 95C
Tractors**

Repair


Vol. 2
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SECTION 31 - MECHANICAL POWER TAKE-OFF

BOOK 2 - 87758600

Chapter 1 - Mechanical Power Take-Off

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SECTION 55 - ELECTRICAL SYSTEM

BOOK 3 - 87758601

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SECTION 55 - ELECTRICAL SYSTEM

BOOK 6 - 87758604

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SOLVENTS - see Chemical Materials - General Fuels (Kerosene), Fire.

e.g. Acetone, white spirit, toluene, xylene, trichlorethane.

Used in cleaning materials, de-waxing, paints, plastics, resins, thinners etc.

Highly Flammable.

Skin contact will degrease the skin and may result in irritation and dermatitis following repeated or prolonged contact. Some can be absorbed through the skin in toxic or harmful quantities.

Splashes in the eye may cause severe irritation and could lead to loss of vision.

Brief exposure to high concentrations of vapors or mists will cause eye and throat irritation, drowsiness, dizziness, headaches and in the worst circumstances, unconsciousness.

Repeated or prolonged exposures to excessive but lower concentrations of vapors or mists, for which there might not be adequate warning indications, can cause more serious toxic or harmful effects.

Aspiration into the lungs (e.g. through vomiting) is the most serious consequence of swallowing.

Avoid splashes to the skin, eyes and clothing. Wear protective gloves, goggles and clothing if necessary.

Ensure good ventilation when in use, avoid breathing fumes, vapors and spray mists and keep containers tightly sealed. Do not use in confined spaces.

When the spraying material contains solvents, e.g. paints, adhesives, coatings, use extraction ventilation or personal respiratory protection in the absence of adequate general ventilation.

Do not apply heat or flame except under specific and detailed manufacturers instructions.

Sound Insulation - see Fiber Insulation, Foams.

Spot Welding - see Welding.

SUSPENDED LOADS.

There is always a danger when loads are lifted or suspended. Never work under an unsupported suspended or raised load, e.g. jacked up vehicle, suspended engine, etc.

Always ensure that lifting equipment such as jacks, hoists, axle stands, slings, etc. are adequate and suitable for the job, in good condition and regularly maintained.

Never improvise lifting tackle.

Underseal - see Corrosion Protection.

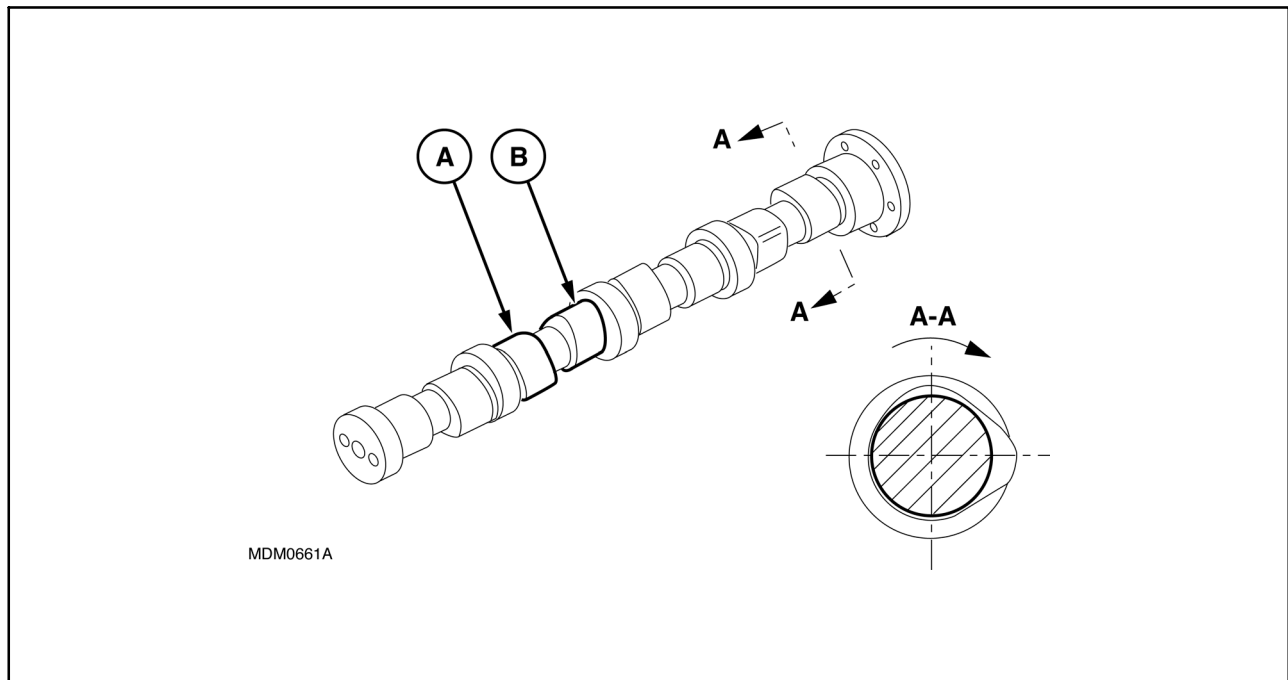
WELDING - see Fire, Electric Shock, Gas Cylinders.

Welding processes include Resistance Welding (Spot Welding), Arc Welding and Gas Welding.

Resistance Welding

This process may cause particles of molten metal to be emitted at high velocity and the eyes and skin must be protected.

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Camshaft view

A. Inlet valve cam.

B. Exhaust valve cam.

DESCRIPTION AND OPERATION**EXHAUST GAS RECIRCULATION SYSTEM (EGR)**

On the TIER 3 version, the exhaust cam profile has been modified to permit partial opening of the related valve during the inlet phase (exhaust gas recirculation EGR) with the consequent re-introduction of some of the exhaust gases into the engine cylinders.

The exhaust gases can be partially redirected into the cylinders in order to reduce the maximum combustion temperature values which are responsible for the production of nitrogen oxide (NO_x).

The exhaust gas recirculation system (EGR), reducing the temperature of combustion by decreasing the concentration of oxygen in the combustion chamber, is therefore an effective system to control emissions of NO_x .

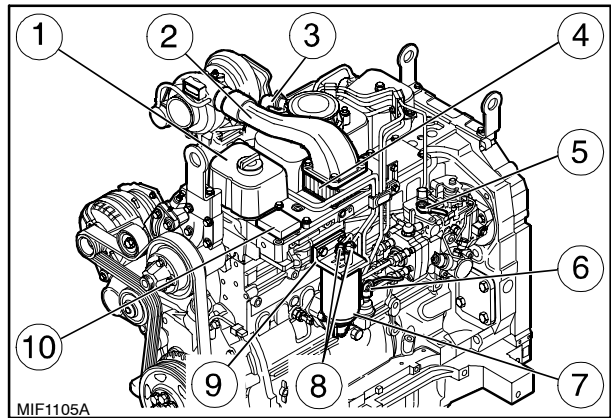
The internal EGR system is not provided with any electronically controlled elements: the system is always on.

Its configuration needs no additional elements such as control valves, pipes or heat exchangers.

The exhaust cam (B) in addition to the main lobe has another lobe (see sect. A-A, fig. 5) with respect to the configuration without EGR.

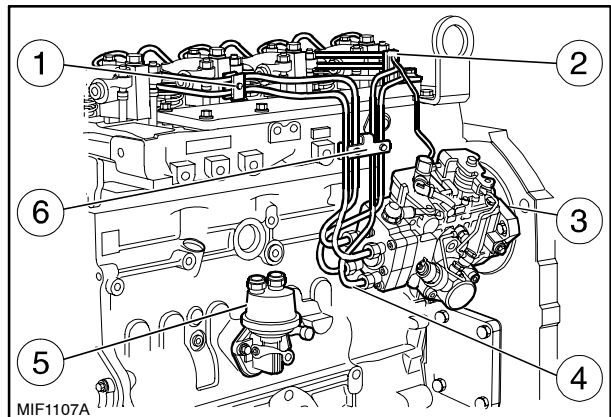
The additional lobe, during the inlet phase of the cylinder under examination, permits briefly opening the exhaust valve generating recirculation due to the exhaust gases returning caused by the lower pressure created in the inlet phase inside the cylinder.

7. Remove the intake manifold (2).
8. Disconnect the engine oil vapor recovery pipe from the blow-by (3).
9. Remove the tappet covers (1).
10. Remove the pipes with the quick-fit coupling (6) and (8).
11. Remove the piping from the LDA system (5).
12. Remove the fuel filter (7).
13. Remove the heater (4).
14. Remove the control unit for the heater (10).
15. Remove the fuel filter support (9).



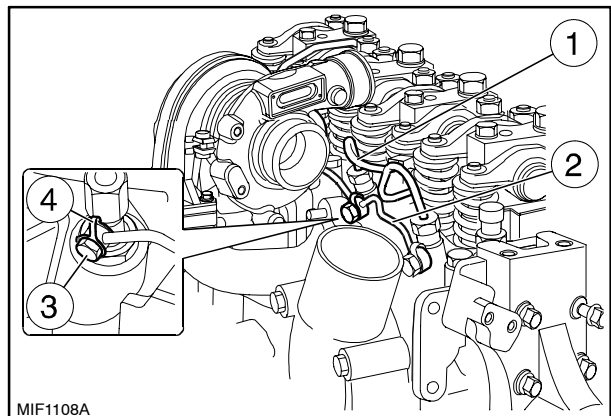
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16. Remove the injector feed pipe (4) from the injection pump (3).
17. Remove the brackets on the cylinder head of the pipe assembly (1), (2) and (6).
18. Replace fuel supply pump (5).



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19. Detach the fuel pipe assembly (1) from the injectors.
20. Remove the fuel outlet pipe (2) from the injectors removing the screw (3) and the seal (4).

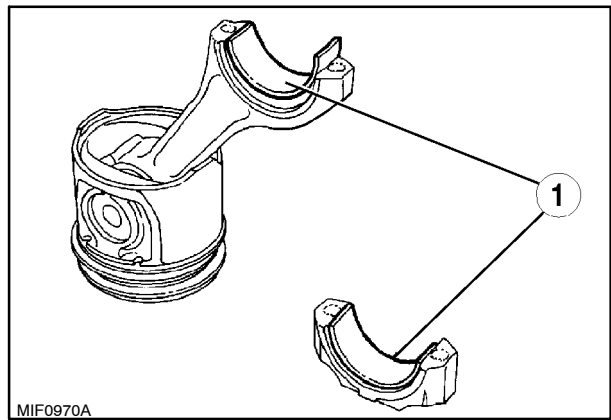


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- Fit the half bearings (1) on the connecting rod and cap.

NOTE: If the crankpins of the crankshaft are undersized it is necessary to replace the big end bearings of the same undersize class made.

Do not modify the half bearings in any way.

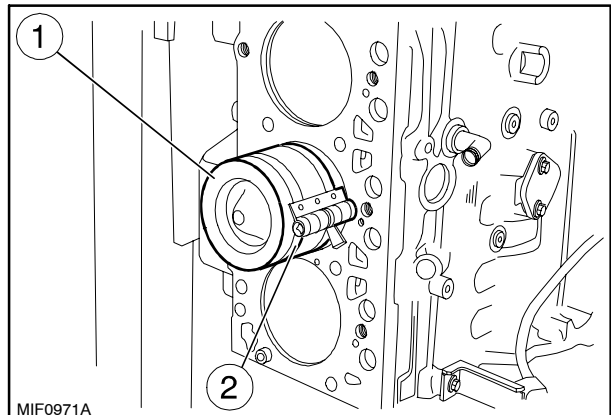


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Fitting the Piston Connecting Rod Assemblies in the Cylinder Liners

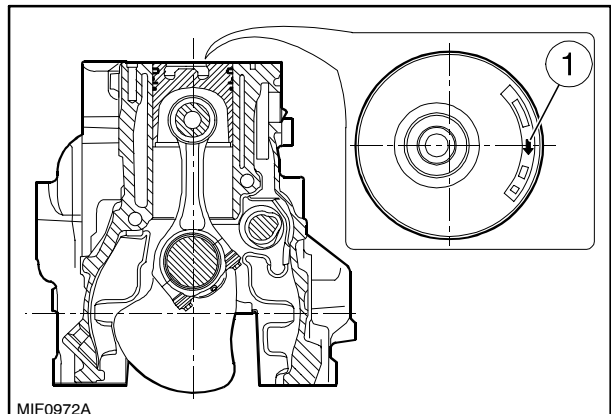
(Disassembly operation 56.)

- Lubricate the pistons well, including the piston rings and the inside of the cylinder liners.
- With the aid of the ring clamp **380000220** (2), fit the connecting rod-piston assemblies (1) in the cylinder liners.



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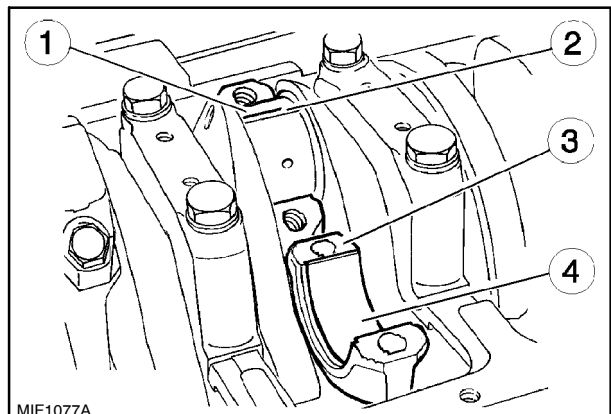
- The ring openings must be staggered apart by 120°;
- The connecting rod/piston assemblies must all have the same weight;
- The arrow (1) stamped on the crown of the pistons must face the auxiliary member side of the engine and the recess in the piston skirt must correspond to the position of the oil nozzles.



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To measure the clearance proceed as follows:

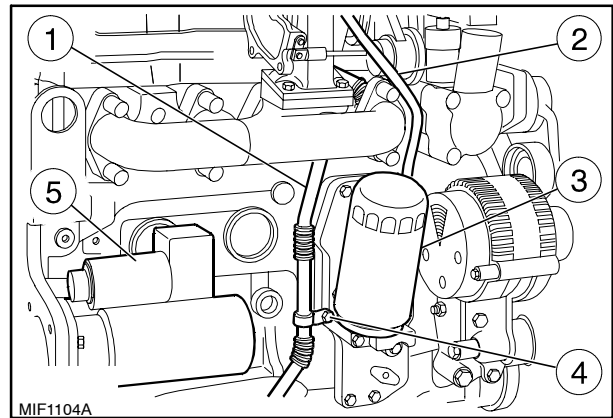
- Carefully clean the parts and remove all traces of oil;
- Position a length of calibrated wire (2) on the crankshaft journals (1);
- Fit the connecting rod caps (3) with the relevant half bearings (4).



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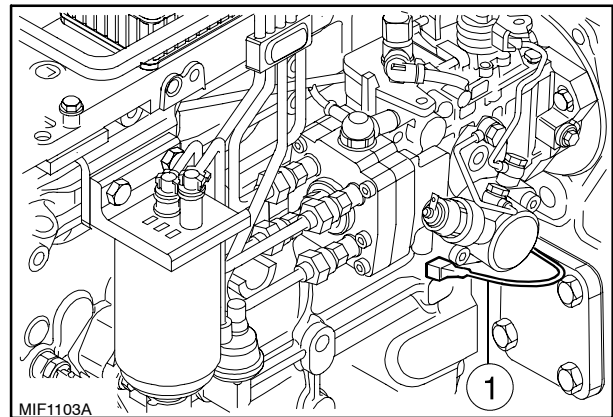
Fitting the Starter Motor

- Fit the oil delivery pipe (2).
- Fit the turbine oil return pipe (1), the clamp (4), oil filter (3) and starter motor (5).



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- Fit the wiring (1).
- Fit the fan unit to the fan pulley.
- Add engine oil through the filler plug.
- Install the hood as described in operation **90 100 22**.



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CYLINDER HEAD

WARNING

Handle all parts carefully.
Do not put your hands or fingers between parts.
Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

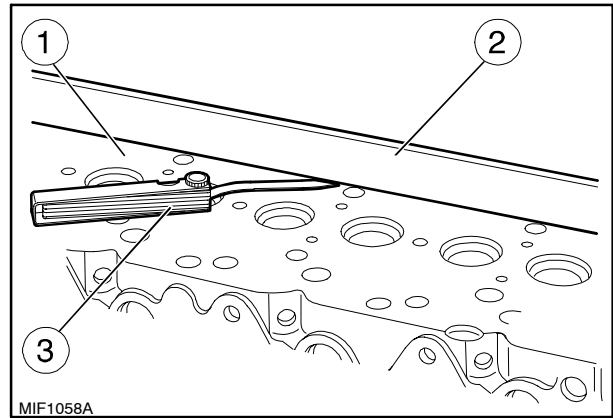
Use tool **380000302** to remove and refit valve springs.
Clean all parts carefully before proceeding with any type of operation.

Checking the Cylinder Head Mating Surface

The mating surface of the head (1) with the cylinder block should be checked with a rule (2) and a feeler gauge (3).

The deformation measured on the full length of the cylinder head must be no greater than 0.20 mm (0.079 in.).

If it is any higher, regrind the cylinder head according to the dimensions and warnings given in the following figure.

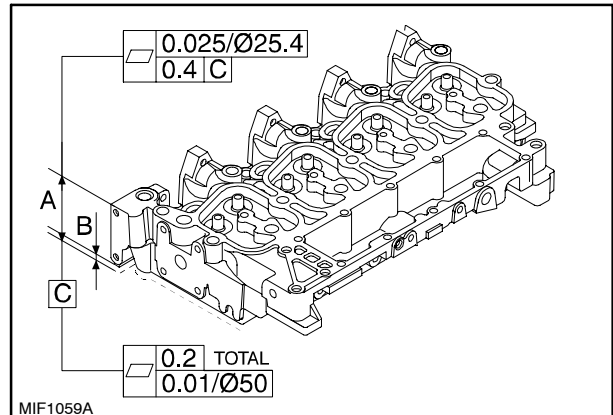


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Cylinder Head Thickness

The nominal thickness A of the cylinder head is 95 ± 0.25 mm (3.7401 ± 0.0098 in.) the maximum permissible amount of metal removed must not exceed the thickness B of 0.13 mm.

NOTE: After regrinding, check the valve recessing and if necessary regrind the valve seats to obtain the recessing prescribed in Specifications Table.



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TOLERANCES	CHARACTERISTIC SUBJECT OF TOLERANCE	GRAPHIC SYMBOL
SHAPE	Flatness	

Cylinder Head Hydraulic Seal Check

Check the hydraulic seal using the appropriate tools.
Using a pump, introduce water heated to ~ 90°C (194°F) at a pressure of 2 to 3 bar (29 to 44 psi).

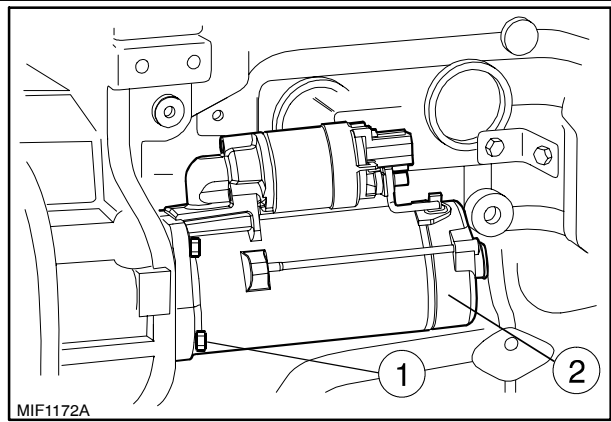
If there is any leakage from the cup plugs, replace them, using a suitable drift for their disassembly - assembly.

NOTE: Before fitting the plugs (3, fig. 160) apply a water-reactive sealant on their sealing surface.

If you find any leakage from the cylinder head, it must be changed.

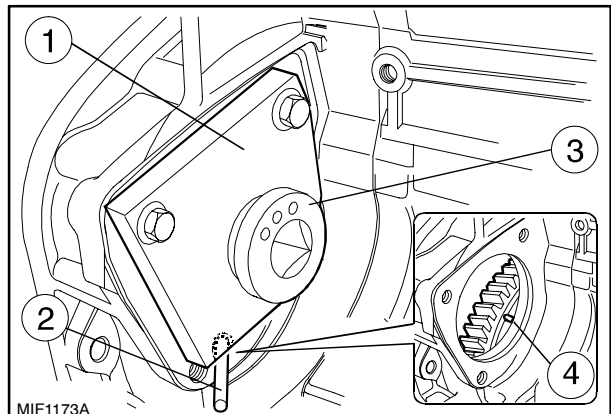
Timing

1. If it is necessary to change the fuel pump, it is supplied already pre-set as a spare part.
2. Remove the starter motor (2), taking out the bolts (1).



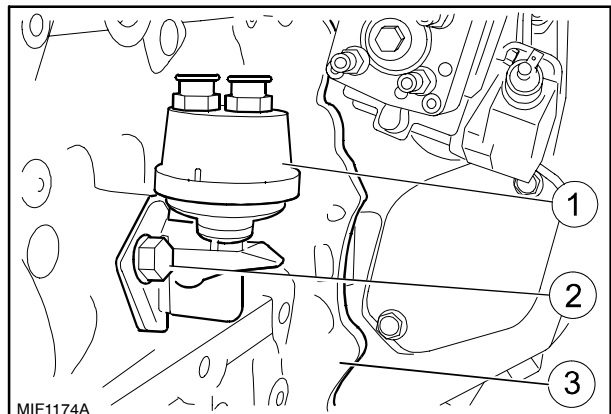
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3. Fit the bracket of tool **380000988** (1) retaining the flywheel together with the rotation wheel **380000732** (3).
4. Carefully turn the flywheel in its direction of rotation to cancel the clearances of the gears.
5. Turn the engine until the pin (2) supplied with tool **380000988** engages through the slot in the flywheel (4).



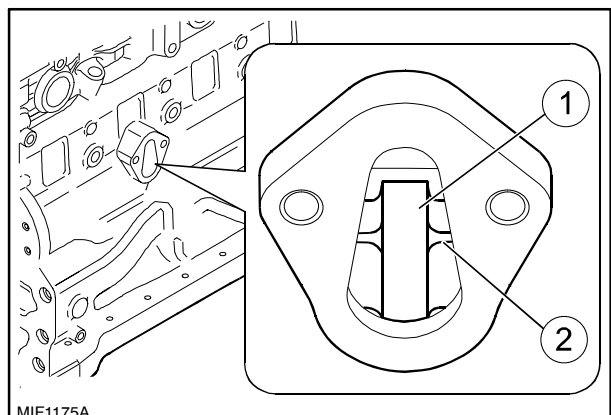
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6. Unscrew the retaining bolts (2) and remove the priming pump (1) from the crankcase (3).



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7. Check through the seat of the priming pump that the camshaft (1) is in step (at TDC) using the reference marks (2) on the shaft.
If the marks are not evident, withdraw the pin from the flywheel and rotate the engine 360° until the reference marks are visible. Re-insert the pin to lock.



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(overleaf)

GENERAL	
Valve Timing	overhead valves operated by tappets, rods and rocker arms via the camshaft located in the engine block; the camshaft is driven by the crankshaft using straight-tooth gears
Intake:	
- start: Before T.D.C.	19° ± 30'
- end: after B.D.C.	37° ± 30'
Exhaust:	
- start: before B.D.C.	61° ± 30'
- end: after T.D.C.	21° ± 30'
Clearance between valves and rocker arms with engine cold:	
- intake	0.25 ± 0.05 mm (0.0098 ± 0.002 in.)
- exhaust	0.50 ± 0.05 mm (0.0197 ± 0.002 in.)
Power supply	
Air filtering	dual cartridge dry air filter, with clogged filter indicator with centrifugal pre-filter and automatic dust ejector
Fuel pump	with double diaphragm
Fuel filtration	through wire filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump
Cam operated	via engine timing
BOSCH Injection pump	rotating distributor type
All-speed governor, incorporated in pump:	
BOSCH	centrifugal counterweights
Automatic advance regulator, incorporated in pump:	
BOSCH	hydraulic
Turbocharger:	
- type	HOLSET
Injection pump	rotating distributor with speed governor and advance variator incorporated
BOSCH pump:	
- mod. 65C - type F5AE9484A*A	VE 4/12 F1150-504246316
- mod. 75C - type F5AE9484B*A	VE 4/12 F1150-504246318
Direction of rotation	clockwise
Injection order	1-3-4-2 (for all models)

LUK 11" CLUTCH		
Type		single dry plate clutch
Driving		operation with pedal
Engagement and release mechanism		Belleville spring disk
Driven plate lining material for PTO clutch		cerametallic pads
Driven plate thickness for PTO clutch (1, fig. 2)	mm (in)	7.3 to 7.9 (0.2874 to 0.3110)
- Driven plate wear limit	mm (in)	see page 21
Clearance between clutch release sliding sleeve and support ...	mm (in)	0.050 to 0.151 (0.002 to 0.0059)

BOLT TORQUES

PARTS TO BE TIGHTENED	Thread	Tightening torque	
		Nm	ft-lbs
11"/11" clutch/flywheel retaining bolts	M 8 x 1.25	20 to 25	15 to 18
Release command fork securing bolt (7, fig. 1) .	M 16 X 1.5	136 to 165	100 to 122
Clutch housing/engine retaining nuts	M 12 x 1.25	117 to 129	86 to 95
Nut for sleeve cover fixing stud (6, fig. 1)	M 8 x 1.25	20 to 25	15 to 18

SPECIAL TOOLS

WARNING

The operations described in this section cannot be carried out without the **ESSENTIAL** tools marked with an **(X)**.

To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

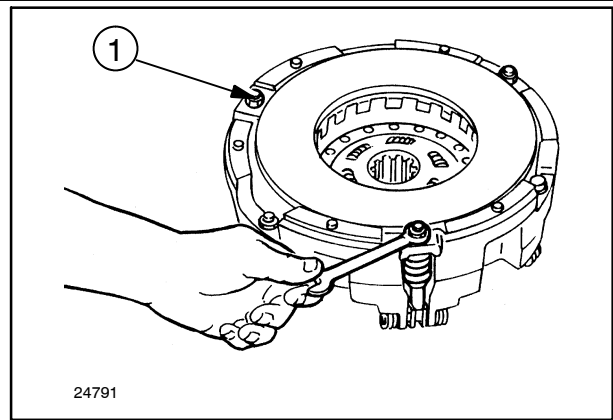
List of specific tools required for the various operations described in this Sect.

- X 380001612** Pin for centering and adjustment of 11"/11" clutches.
- X 380000293** Clutch adjustment gauge (with **380001612**).
- 380000256** Set of wrenches for adjustment of levers in 11"/11" LUK clutches.

Op. 18 110 30

11"/11" DUAL DISK CLUTCH**Disassembly****CAUTION**

Use suitable tools to align the holes. NEVER USE FINGERS OR HANDS.

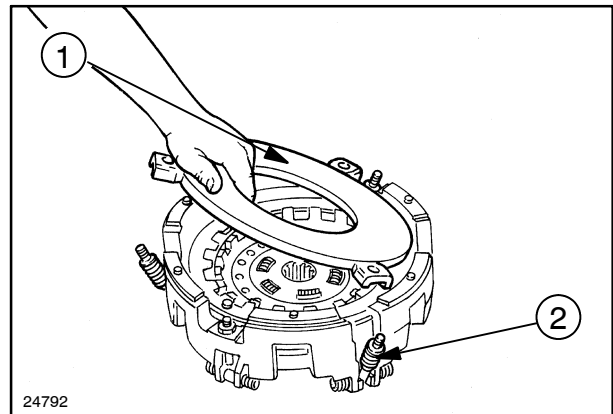


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Proceed as follows.

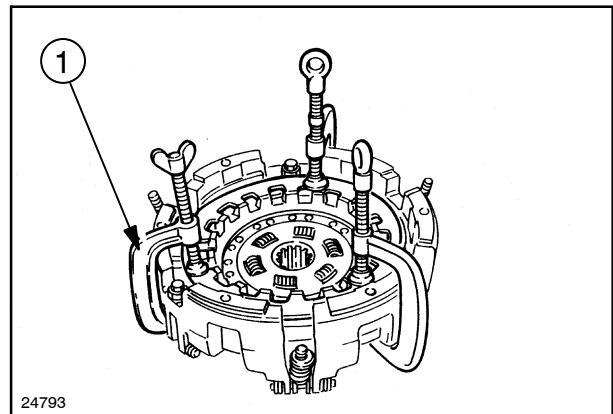
1. Unscrew the three PTO clutch lever adjustment nuts (1).
2. Recover the pressure plate (1) with the three coil springs (2) and the three washers.



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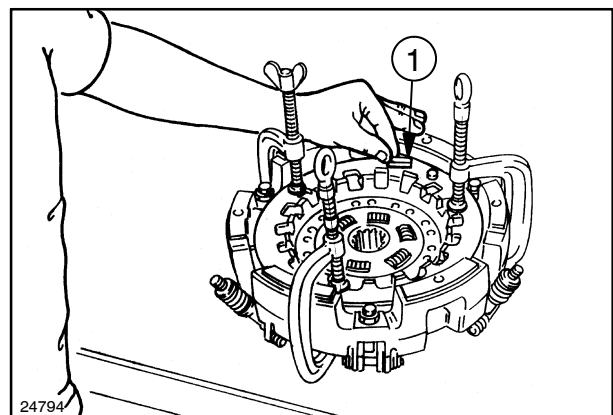
3. Position three clamps (1) at intervals of 120° on the clutch body and gradually and carefully squeeze the Belleville spring disk.



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4. Extract the six spring retaining pins (1) from their seats.



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SPECIAL TOOLS

**WARNING**

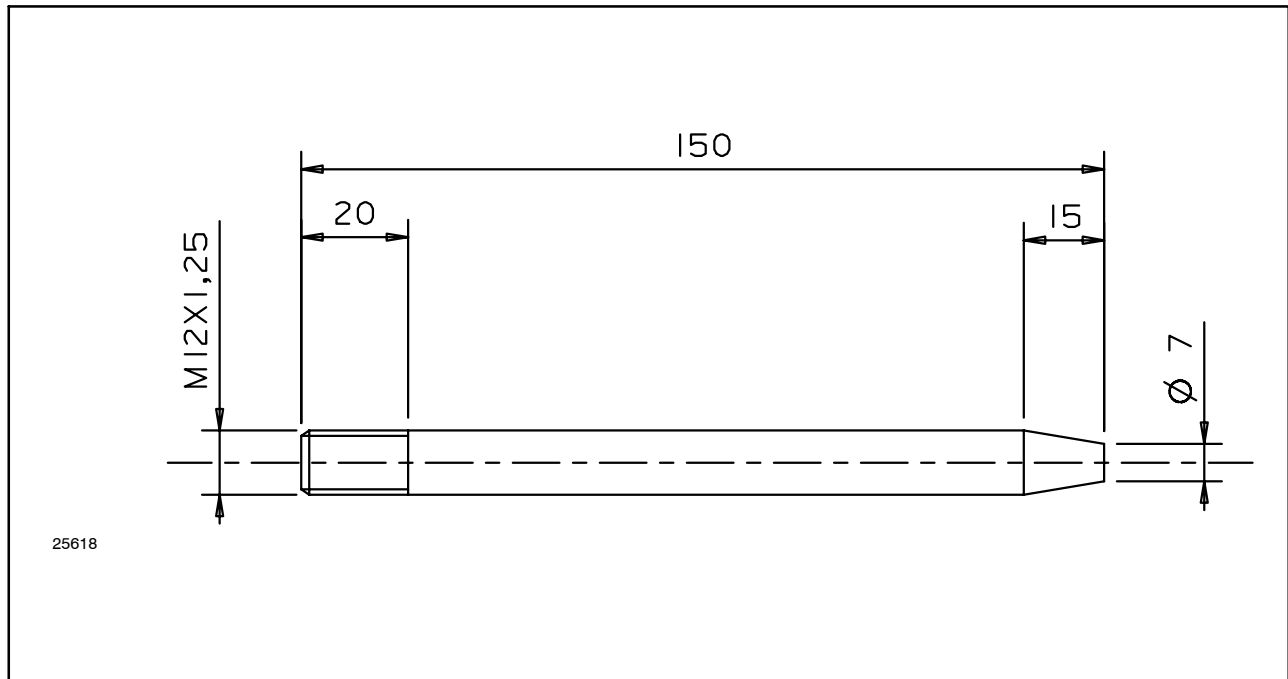
The operations described in this section can only be carried out with **ESSENTIAL** tools indicated by an **(X)**.

To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Sect.

- 380000227** Clutch casing lift hook.
- 380000301** Turning stand for overhaul.
- X 380001614** Tool for gearbox driving and driven shafts adjustment.
- X 380001615** Driving shaft rod for lifting unit.

- X 380001616** Driven shaft retaining tool.
- X 380001617** Pliers for gearbox shafts circlips.
- 380001618** Driving shaft fitting guide.
- X 380001619** Driven shaft fitting guide.
- X 380001610** Adjuster handle (with **380001620** and **380001609**).
- X 380001620** Power take-off drive shaft seal splining tool (with **380001610**).
- X 380001609** Power take-off drive shaft roller bearings splining tool (with **380001610**).
- 50091** Tool for removal-installation final drives (see section 27).



Guide pin for re-fitting the gearbox in the casing. (Mark part with no. 50158 - Measurements in mm)

Make in C 40 material.

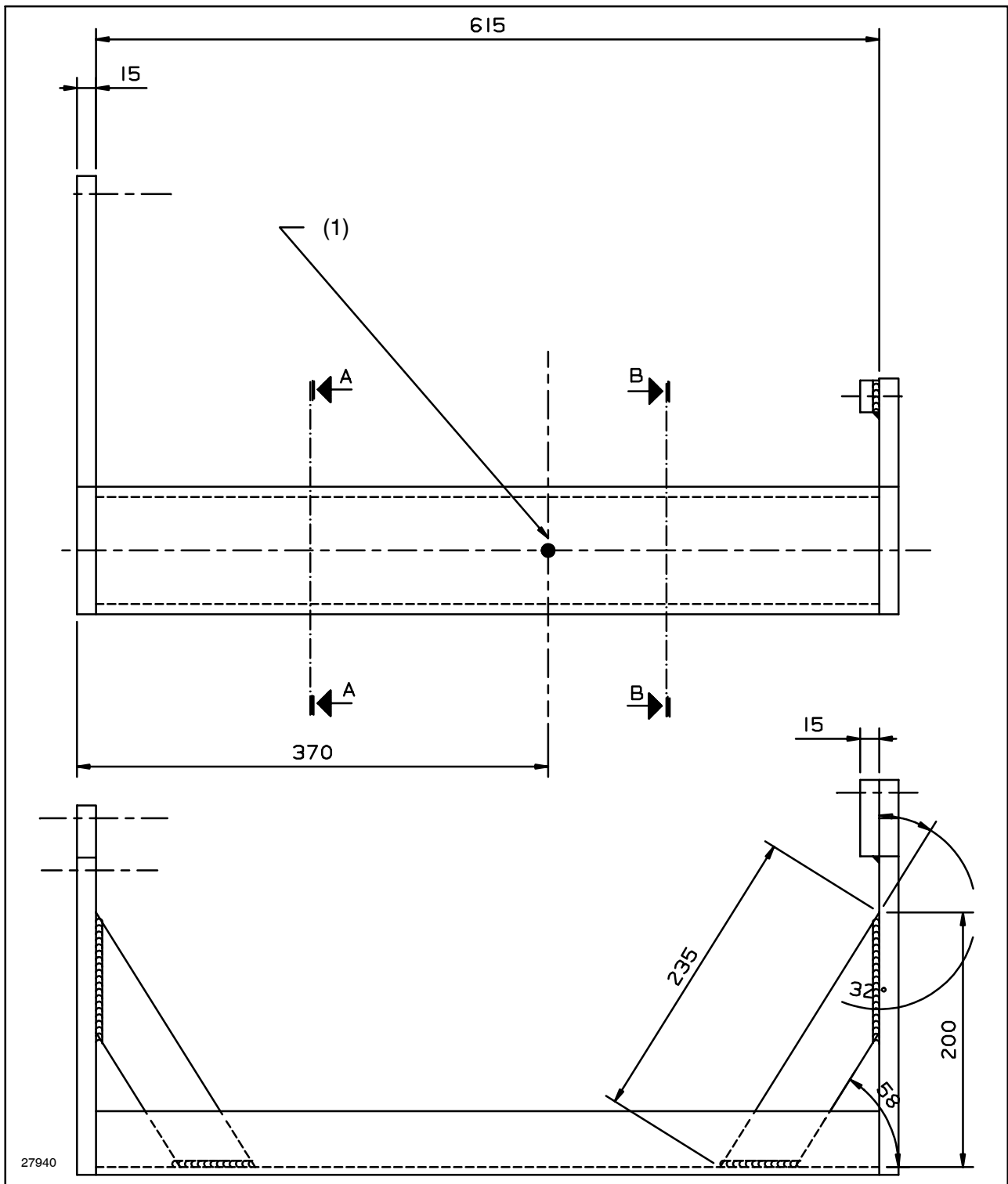
9. Refit the rear transmission-gearbox case and clutch casing to the engine.
10. Attach the cab mounting.
11. Connect all of the services control valve pipes.
12. Connect the brake and services control pipes.
13. Connect the heat exchanger pipes.
14. Fit the rear transmission-gearbox case oil intake pipes.
15. Connect the trailer brake and lift control pipes.
16. Connect all of the lateral filter and front differential lock control pipes.
17. Tighten the rear transmission-gearbox oil drainage plug.
18. Assemble the hydraulic lift.
19. Fit the Fast Raise/Lower control lever.
20. Assemble and connect the auxiliary control valve support and trailer brake valve pipes.
21. Fit the towbar and towing hook.
22. Re-connect the vertical rods to the lift arms.
23. Fit the brake disks, the differential axle shafts and final drives.
24. Fit the rear wheels and remove the support stands.
25. Carry out operation **90 150 10**: Cab with platform unit, only installation (see Section 90, Chapter 1).
26. Carry out operation **23 101 26**: Propeller shafts and guard, only installation (see Section 23, Chapter 1).
27. Carry out operation **10 216 10**: Fuel tank, only installation (see Section 10, Chapter 1).
28. Fill up the rear transmission-gearbox casing (see page 6, Sect. 00 for prescribed products and quantities).

SECTION 21 - GEAR TRANSMISSION

Chapter 2 - Mechanical Transmission and Splitter

CONTENT

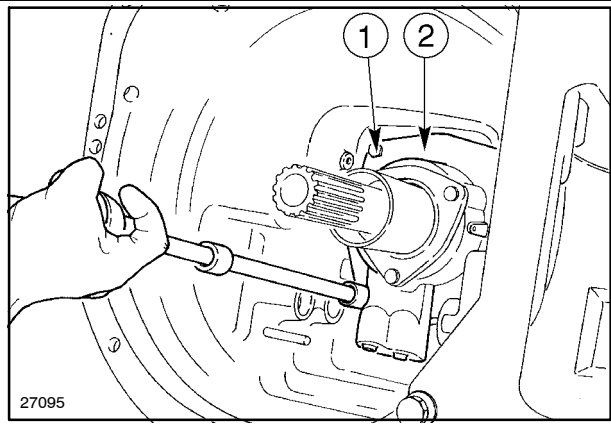
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21 160 31	Splitter Device and Creeper Unit Gearbox, Shafts and Bearings	8
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Bracket to be made for gearbox overhaul on rotating stand. (Mark tool No. 50157 - Measurements in mm)

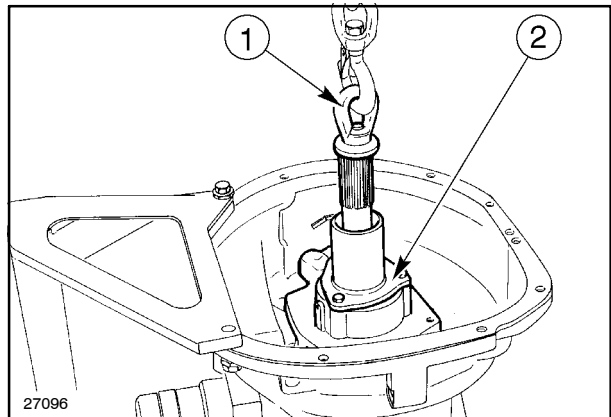
1. Rotating stand shaft - Make in Aq 42 material.

6. Unscrew the front bearing support (2) retaining bolts (1).



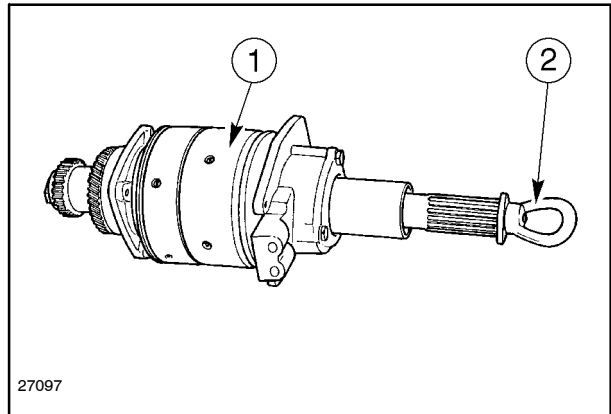
38

7. Insert tool **380001621** (1) on the clutch unit (2), secure in position and remove, using a hoist.



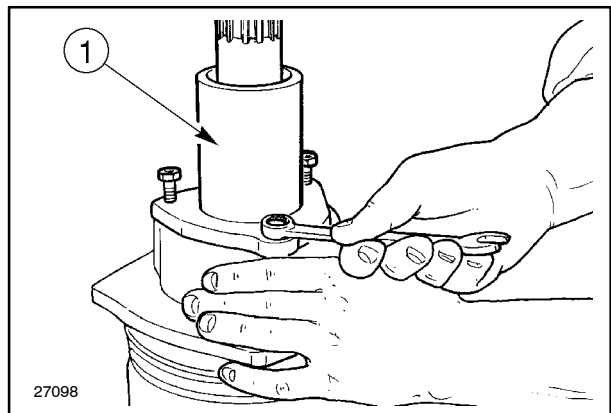
39

8. Position the clutch unit (1) on a workbench, remove tool **380001621** (2) and separate the unit into two parts.

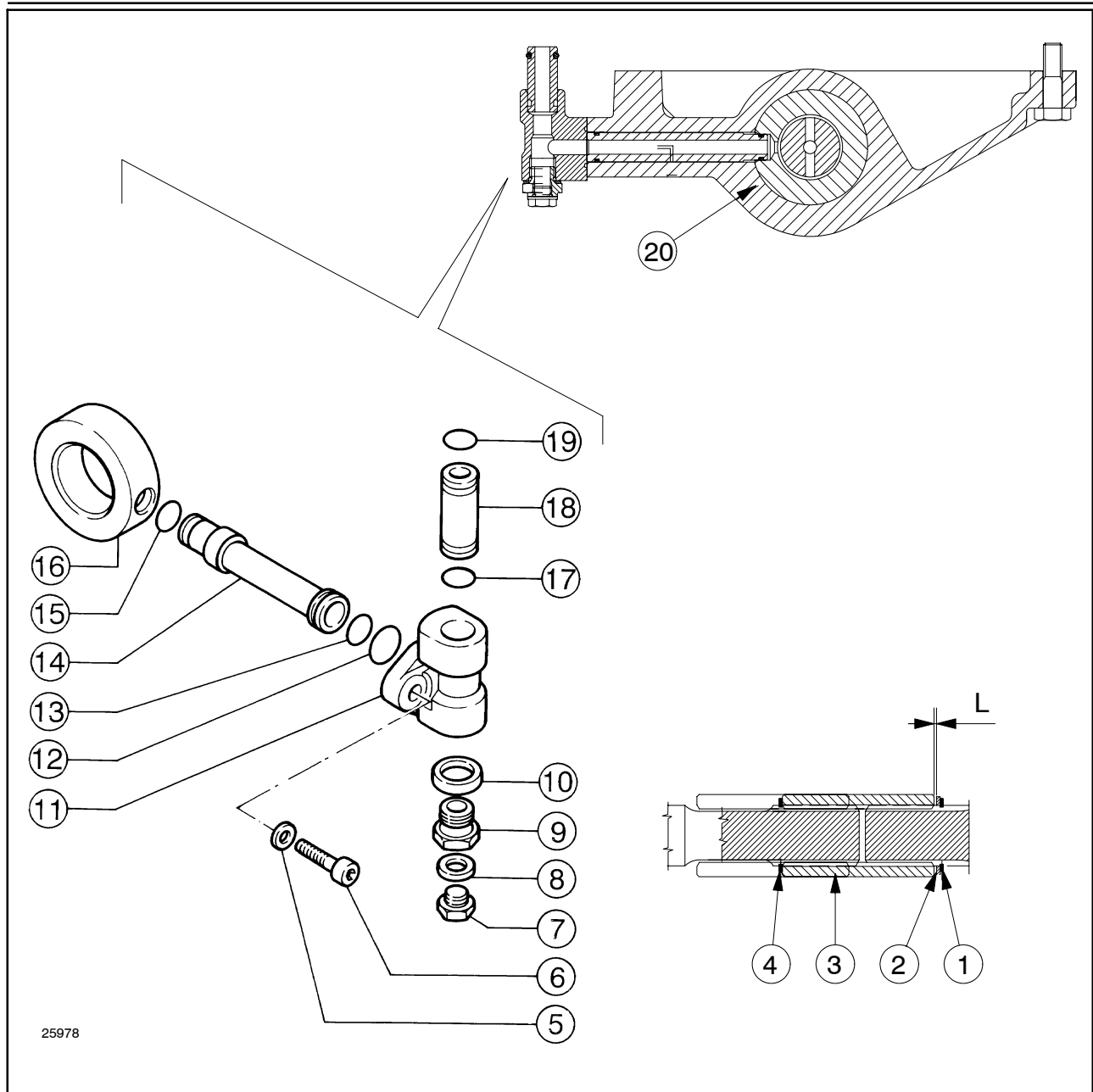


40

9. Unscrew the retaining bolts and remove the sleeve (1) for the power take-off clutch engagement sleeve.



41



25978

5

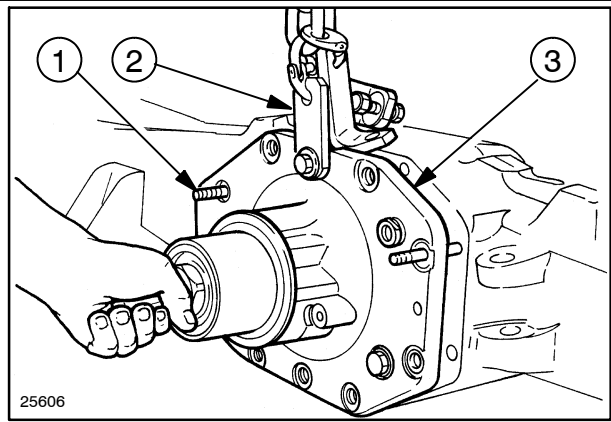
Control cylinder oil delivery union and front grooved sleeve

- | | |
|-----------------------------------|-------------------------|
| L. Axial clearance of sleeve (3). | 11. Coupling. |
| 1. Circlip. | 12. Seal. |
| 2. Adjustment shim. | 13. 'O' Ring Seal. |
| 3. Sleeve. | 14. Rigid piping. |
| 4. Circlip. | 15. 'O' Ring Seal. |
| 5. Flat washer. | 16. Manifold ring. |
| 6. Screw. | 17. 'O' Ring Seal. |
| 7. Plug. | 18. Rigid piping. |
| 8. Flat seal. | 19. 'O' Ring Seal. |
| 9. Coupling. | 20. Drive gear housing. |
| 10. Flat seal. | |

TORQUES

PARTS TO BE TIGHTENED	Thread	Tightening torque	
		Nm	ft-lbs
Front axle			
Crown wheel to differential gearbox retaining bolt (C ₁)	M 12 x 1.25	119 to 144	88 to 106
Differential lock device retaining bolt (C ₂)	M 10 x 1.25	60 to 70	44 to 52
Differential bevel gear support to axle casing retaining bolt (C ₃) .	M 12 x 1.25	119 to 144	88 to 106
Bevel pinion shaft locknut (C ₄)	M 35 x 1.5	294	217
Steering knuckle pin retaining bolt (C ₅)	M 10 x 1.25	55 to 67	41 to 49
Wheel hub bearing locknut (C ₆)	M 70 x 2	392	289
Epicyclic final drive housing retaining bolt (C ₇)	M 10 x 1.25	55 to 67	41 to 49
Front axle support to engine retaining bolt (C ₈)	M 18 x 1.5	310 to 380	229 to 281
Front axle pivot front and rear supports retaining bolt (C ₉)	M 18 x 1.5	370 to 410	273 to 302
Differential housing support cap retaining bolt (C ₁₀)	M 12 x 1.25	119 to 144	88 to 106
Ring nut fastening the steering control hydraulic cylinder to the front axle (C ₁₁)	-	630 to 670	465 to 494
Bolt retaining steering control linkage ball joint (C ₁₂)	-	242 to 299	179 to 221
Rim to disk retaining bolt	M 18 x 1.5	170 to 208	125 to 153

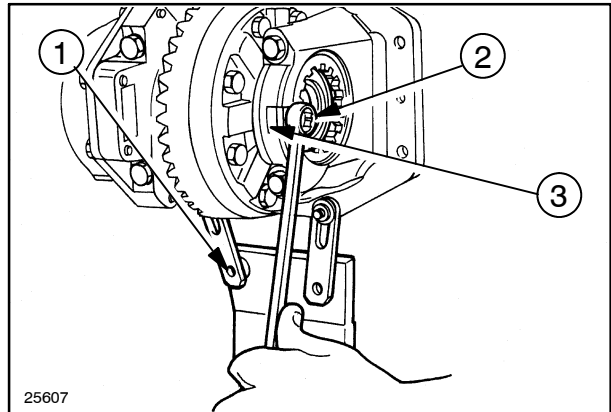
17. Unscrew the two bevel drive-differential support retaining bolts from the axle casing, screw on the two pins **50169** (1). Remove the remaining bolts and the bevel drive-differential support, attach a chain (2) and put the hoist under strain. Remove the bevel drive-differential support (3) from the axle casing.



36

18. Fit tool **380000255** (1) in the vice on a work bench, lock the bevel drive-differential support in the tool and remove the chain.

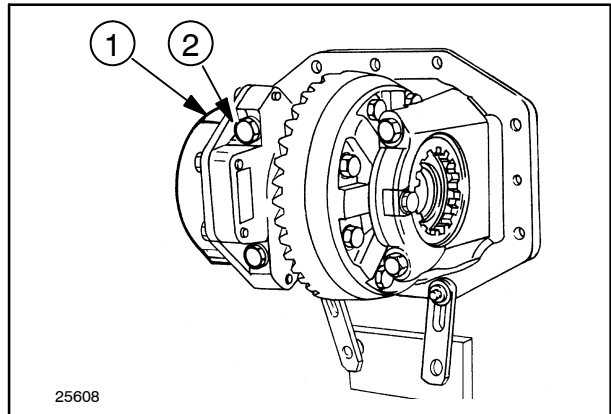
19. Unscrew the screw (2) and retrieve the ring nut locking plate (3). Remove the differential lock control internal pipe.



37

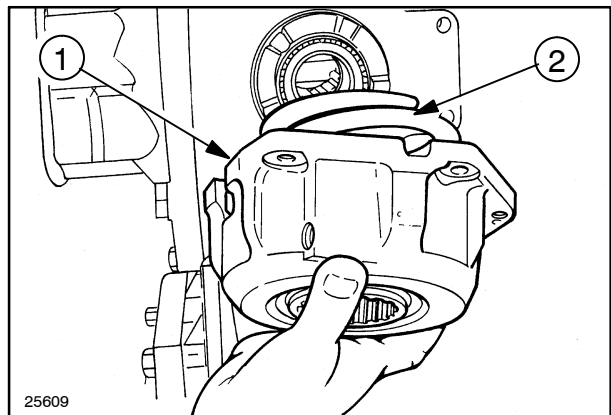
20. Remove the upper (2) and lower bolts of the external differential lock bell housing (1), and install two bolts (minimum length: 70 mm) in their place. Gradually unscrew the four remaining bell housing bolts so as to allow the gradual extension of the differential lock release spring.

Note - It is necessary to install two bolts with a minimum length of 70 mm, because the normal bell housing bolts are not long enough to allow the differential lock spring to extend to its full free length.



38

21. Unscrew the two 70 mm bolts last of all, remove the bell (1), the spring (2) and differential lock control piston.



39

Op. 25 102 24

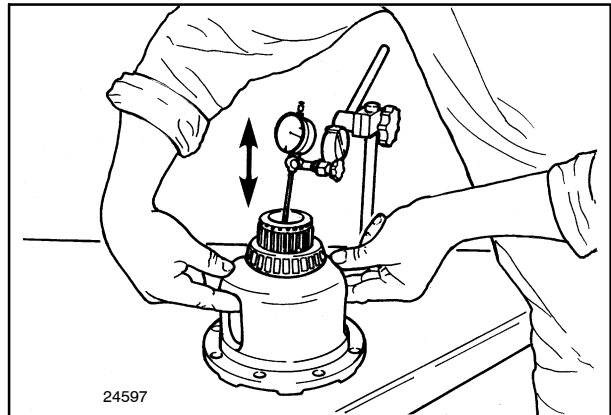
FRONT AXLE DIFFERENTIAL

Overhaul

In case of differential assembly overhaul it is necessary to adjust the backlash between the teeth of the sun and planet pinions.

Proceed as follows.

1. Thoroughly clean the components of the differential to remove any traces of oil that would otherwise prevent accurate backlash measurement.
2. Fit the two sun gears without thrust washers on the differential casing.
3. Fit the planet pinions complete with thrust washers and pins and screw down the pin retaining bolts by a few turns to hold the pins in place.
4. Position a dial gauge on the differential housing.
5. Move the left hand side gear to bring it into full contact with the planet pinion and then push it up against the differential housing, reading the endfloat (G_s) on the dial gauge.
6. Repeat the above operations to measure the endfloat on the right hand side gear (G_d).



76

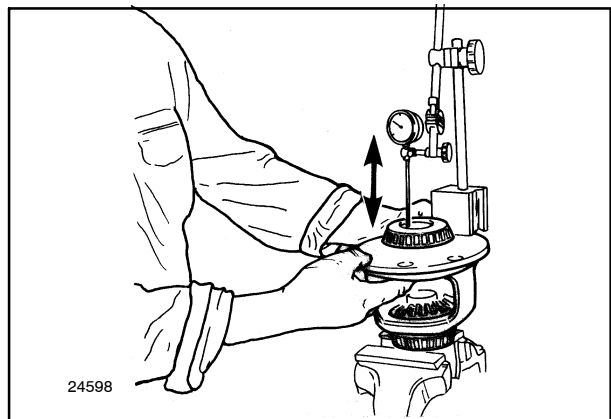
The side gear endfloat will be **0.25 mm (0.0098 in.)**.

Therefore the rings to be inserted in the differential housing are given by:

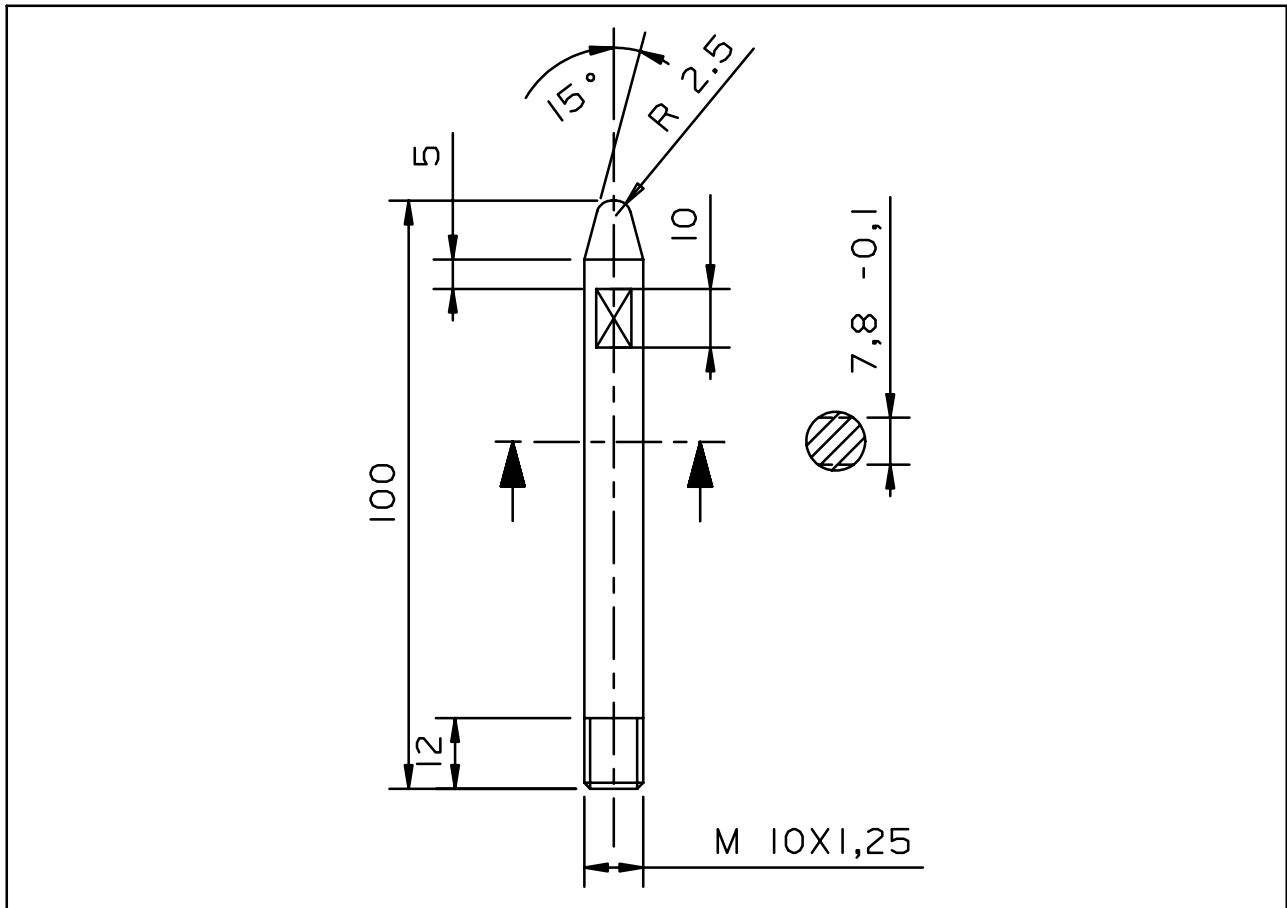
$S_s = G_s - 0.25 \text{ mm (0.0098 in.)}$ for the left-hand side gear;

$S_d = G_d - 0.25 \text{ mm (0.0098 in.)}$ for the right-hand sun gear.

7. Install shims as near as possible to the calculated value and, using a dial gauge and following the previously described procedure, check that the endfloat of the left- and right-hand sun gears is approximately 0.25 mm (0.0098 in.).



77



6

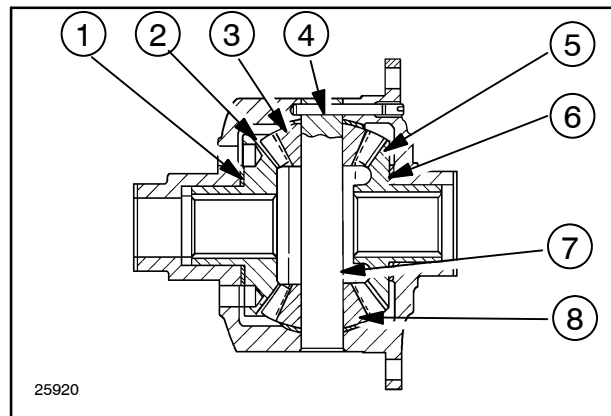
Series of guide pins (no. 2) to be constructed for differential support removing-refitting.
(Mark the pins with no. 50164 - Measurements in mm)

Make using C40 material

Adjustment of the Clearance Between the Sun and Planet Pinion Teeth

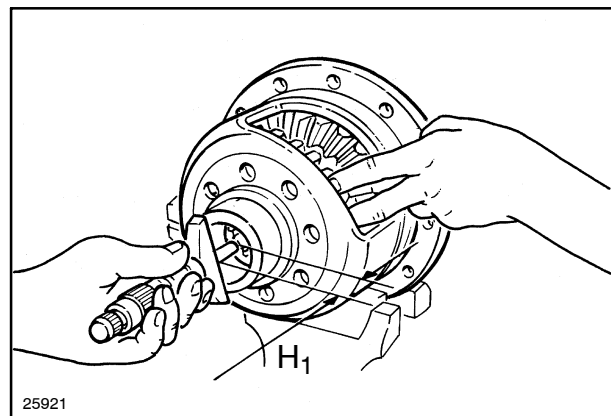
With the differential disassembled on the bench, proceed as follows.

7. Fit the two crown wheels (2 and 5) without rings (1 and 6) on the differential casing. Insert the side pinions (3 and 8) complete with fifth wheel ring adjustment and pin (7); turn the retaining bolt (4) a few times to prevent the pin from sliding out.

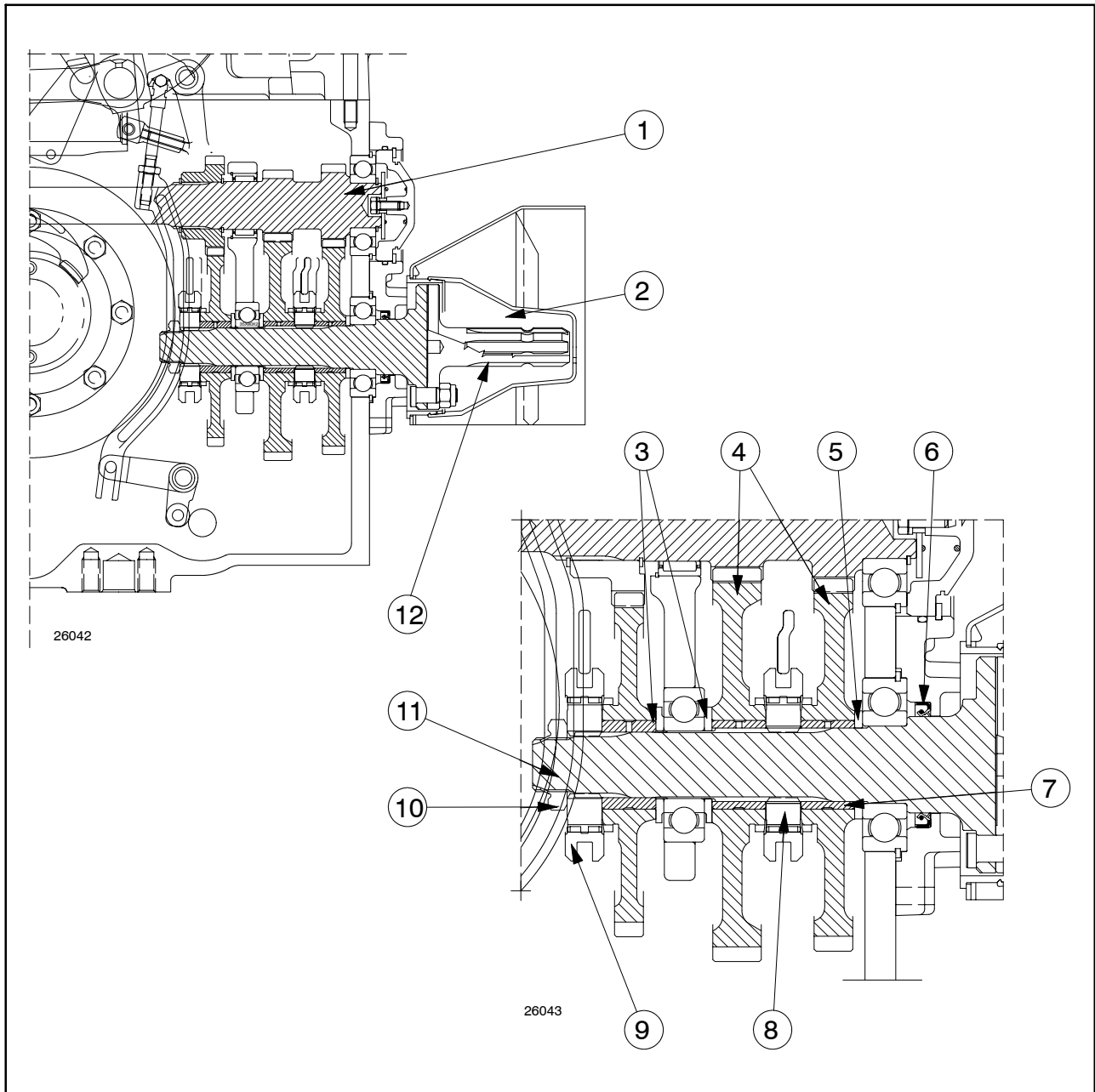


31

8. Manipulate the LH crown wheel, so that it comes into contact with the side pinion and, using a depth micrometer, measure the distance (H_1), taking two diametrically opposed measurements, taking the arithmetic means of the two values measured.



32



5

Sectional view of 540 - 540E - 1000 rpm PTO

- | | |
|-------------------|--------------------------------------|
| 1. Input Shaft. | 7. Driven gear bushings. |
| 2. Guard. | 8. Coupling sleeve PTO 540/540E rpm. |
| 3. Thrust washer. | 9. 1000 rpm PTO coupling sleeve. |
| 4. Driven gears. | 10. Driven shaft lock nut. |
| 5. Thrust washer. | 11. Driven shaft. |
| 6. Seal. | 12. Grooved terminal. |

(overleaf)

Problems	Possible Cause	Solutions
Inefficient braking.	Friction material on brake disks worn (1, page 3). Brake control pumps worn. Air in the brake circuit. Leakage from control pipes. Pump control piston seals worn or damaged.	Replace the brake disks. Replace the brake control pumps. Bleed air from the brake circuit. Eliminate the cause of the leakage. Replace the brake control pumps.
Parking brake does not lock.	Brake control incorrectly adjusted. Braking sectors worn (4, page 3).	Adjust correctly. Replace the braking sectors.
The tractor remains braked when the parking brake is disengaged.	Control return stroke obstructed. Braking sectors (4, page 3) seized on brake disks.	Remove obstructions. Release and replace the damaged parts.

(overleaf)

External diameter of draft control idler shaft	mm (in.)	21.967 to 22.000 (0.8648 to 0.8661)
Internal diameter of seats in support	mm (in.)	22.020 to 22.072 (0.8669 to 0.8690)
Clearance between idler shaft and its seat	mm (in.)	0.020 to 0.105 (0.0008 to 0.0041)
Diameter of position control transmission shaft	mm (in.)	13.973 to 14.000 (0.5501 to 0.5512)
Internal diameter of position control idler shaft	mm (in.)	14.016 to 14.059 (0.5518 to 0.5535)
Clearance between draft control idler shaft and position control idler shaft	mm (in.)	0.016 to 0.086 (0.0006 to 0.0034)
Clearance between control valve block pin (8, fig. 9) and the relative seat on the control valve block body	mm (in.)	0.008 to 0.012 ⁽²⁾ (0.0003 to 0.0005)
Clearance between lift control valve (9) and the relative seat on the control valve block body	mm (in.)	0.008 to 0.014 ⁽²⁾ (0.0003 to 0.0006)
Check valve return spring (3, fig. 9):		
- spring free length	mm (in.)	25.5 (1.0039)
- spring length under load of 52 to 56 N (11.69 to 12.59 lbs/f) .	mm (in.)	17.5 (0.6890)
Control valve block pin return spring (5, fig. 9):		
- spring free length	mm (in.)	50.5 (1.9882)
- spring length under load of 31.7 to 35 N (7.13 to 7.87 lbs/f) . .	mm (in.)	34 (1.3386)
Control valve return spring (10, fig. 9)		
- spring free length	mm (in.)	44 (1.7323)
- spring length under load of 103 to 114.7 N (23.16 to 25.79 lbs/f)	mm (in.)	29 (1.1417)
Arm descent speed control valve spring (13, fig. 9)		
- spring free length	mm (in.)	34 (1.3386)
- spring length under load of 67 to 73 N (15.06 to 16.41 lbs/f)	mm (in.)	27 (1.0630)
Intervention speed control valve spring (11, fig. 9):		
- spring free length	mm (in.)	14.5 (0.5709)
- spring length under load of 65 to 71 N (14.61 to 15.96 lbs/f) .	mm (in.)	11 (0.4331)

(1) Value to be obtained after obtaining interference fit without grinding operations.

(2) During assembly the control valve block pins and control valves are carefully selected so as to obtain the required clearance.

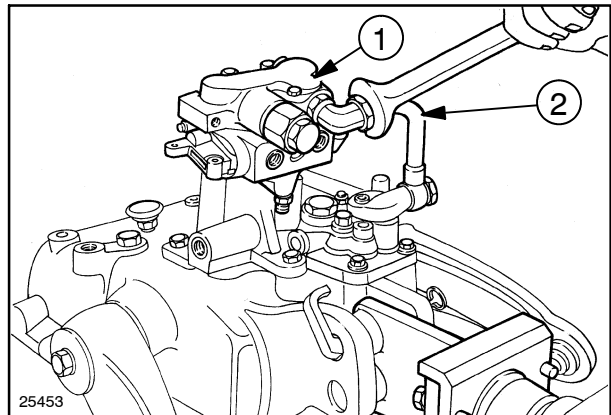
Op. 35 110 40

LIFT INTERNAL CONTROLS
(With the lift removed)**Disassembly****DANGER**

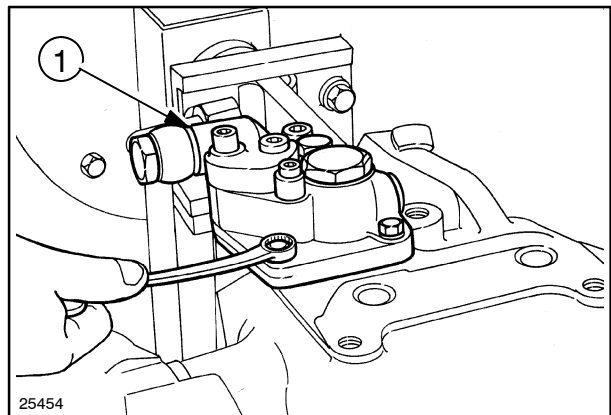
Handle all parts carefully. Do not put your hands or fingers between parts. Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

Proceed as follows.

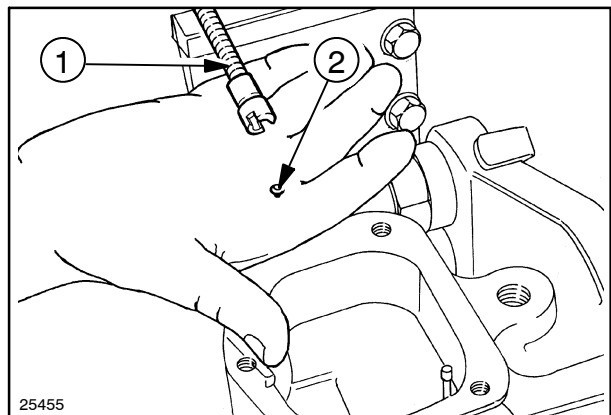
1. Position the lift on a rotating stand **380000301** using the bracket **50155** to be made in the workshop (see fig. 2).
2. Disconnect the connecting pipe (2) between the auxiliary control valve block (1) and the lift control valve block, unscrew the retaining bolts and remove the auxiliary control valve block (1), recovering the O-Ring seal.
3. Unscrew the retaining bolts and remove the lift hydraulic control valve block (1).
4. Rotate the lift holding the relative arms.
5. Using a magnetic flexible tool (1), recover the control valve block pin contact ball (2).



14





15



16

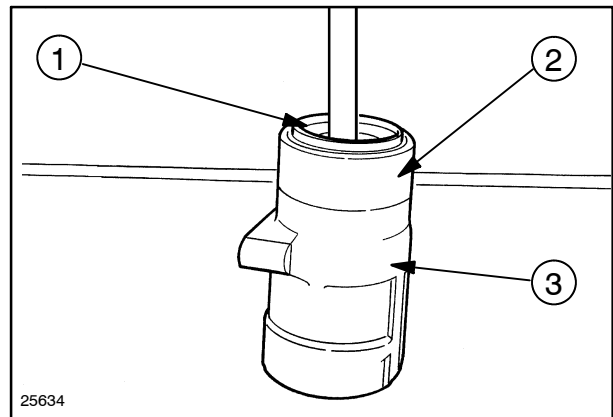
Assembly

—  **CAUTION**  —

Use suitable tools to align the holes. NEVER USE FINGERS OR HANDS.

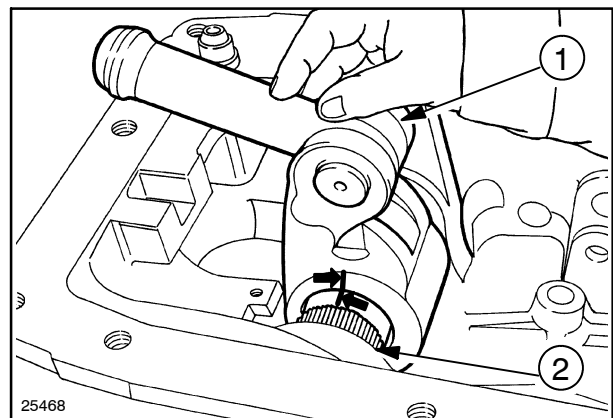
To refit the arm shaft and lifting cylinder, proceed as follows.

- Study the illustrations in figs. 4, 5 and 6 for the positioning of the various parts.
 - Apply the torque settings listed on page 3.
1. Using tool **380001627** (2), insert the piston (1) in the relative cylinder (3).



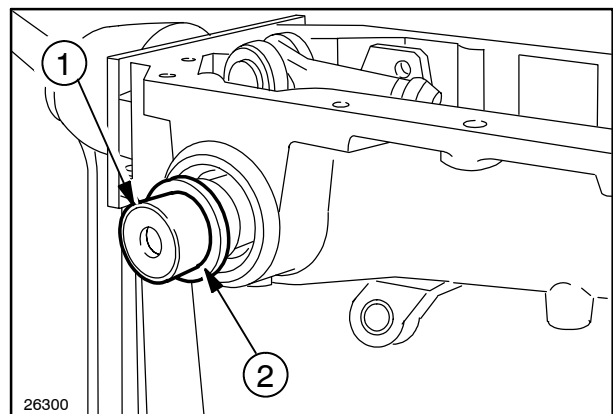
67

2. Fit the lift arm shaft (2), the ring-cam and the internal arm (1) inside the lift box, matching up the reference marks. Tighten the bolt that secures the ring-cam to the internal arm and stake the retaining bolt washer.



68

3. To avoid damaging the internal seal lips (2), use a flexible brass sheet (1) dimensions: 200 x 90 mm (7.8740 x 3.5433 in.) and 0.05 to 0.1 mm (0.0020 to 0.0039 in.). Roll up the sheet and insert the seal inside. Position the unit on the spline and push the seal manually into its seat, then remove the sheet.



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OVERHAUL

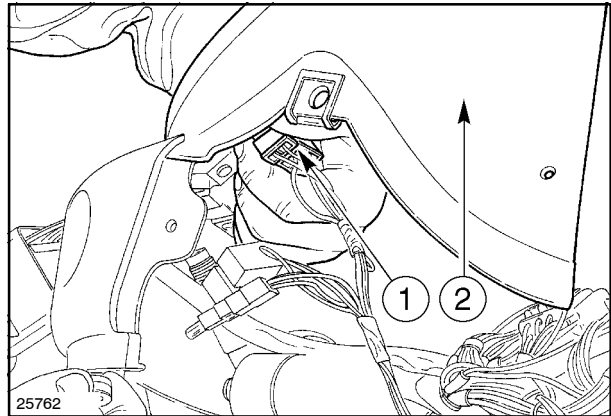
Op. 35 130 30

**LIFT ELECTRONIC CONTROL CENTER
(Replacement)****Removal**

Handle all parts carefully. Do not put your hands or fingers between parts. Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

To remove the control unit, proceed as follows:

1. Carry out operation **55 404 14** Direction indicator switch, only removal.
2. Disconnect the dashboard electrical connections (1) and the dashboard (2).

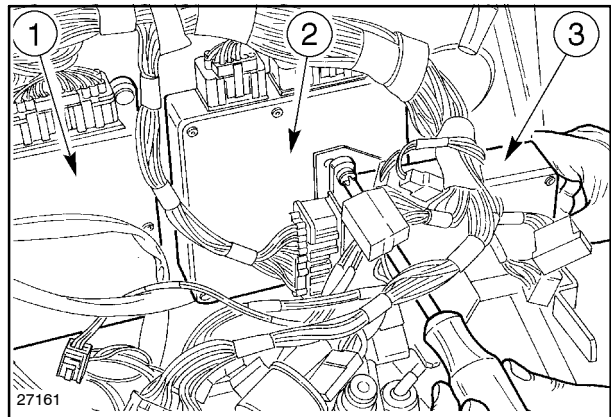


12

3. Remove the retaining bolts that secure the electronic lift control center (1) to the support and disconnect the electrical connections.

Installation

Use suitable tools to align the holes. NEVER USE FINGERS OR HANDS.



13

Proceed as follows.

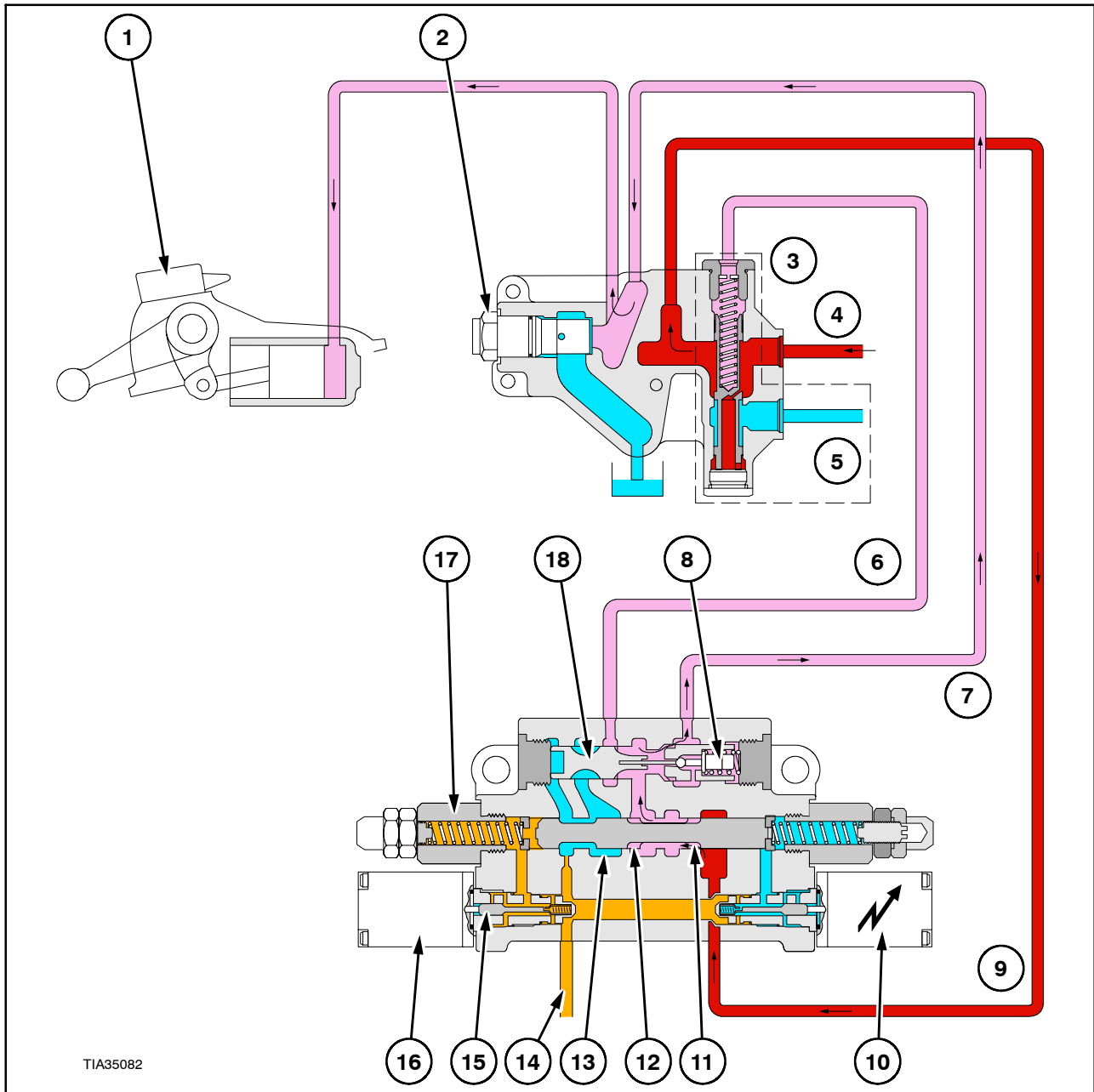
1. Connect the electrical connections to the control center (1, fig. 13) and secure the control center by means of the bolts.
2. Connect the dashboard electrical connections (1, fig. 12) and the dashboard (2).
3. Carry out operation **55 404 14** Direction indicator switch, only installation.

SECTION 35 - HYDRAULIC SYSTEMS

Chapter 4 - Electronically Controlled Hydraulic Lift

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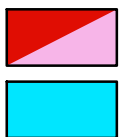


TIA35082

13

Electronically controlled lift functional diagram. Lifting phase

- | | |
|--|---|
| 1. Hydraulic lift. | 10. Solenoid valve (Lowering). |
| 2. Lift cylinder safety valve. | 11. Control valve block pin infeed dosage device. |
| 3. Load Holding Valve. | 12. Control valve block pin return to tank dosage device. |
| 4. Hydraulic pump flow. | 13. Oil discharge hole. |
| 5. Discharge in transmission casing. | 14. Low pressure circuit pilot pressure. |
| 6. Load measuring line. | 15. Pilot valve. |
| 7. To hydraulic lift. | 16. Solenoid valve (Lifting). |
| 8. Non-return valve. | 17. Control valve block pin centering spring. |
| 9. Pump flow to hydraulic control valve. | 18. Lifting valve. |



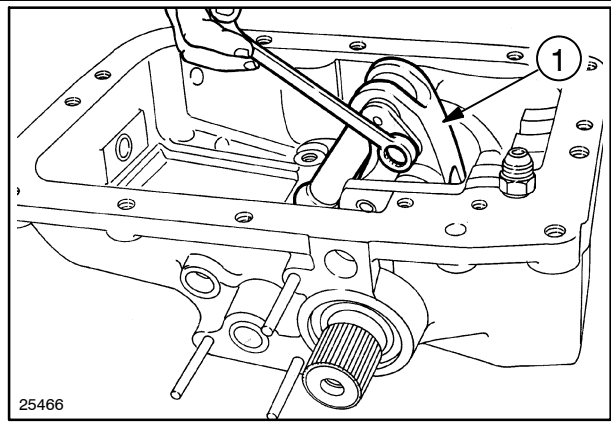
Pump delivery oil.

Discharge oil.



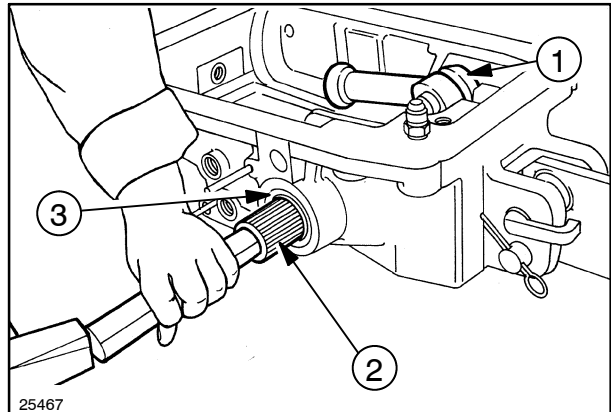
Pilot oil at a pressure of 16 bar.

8. Straighten the securing ring and unscrew the internal arm (9) ring-cam retaining bolt.



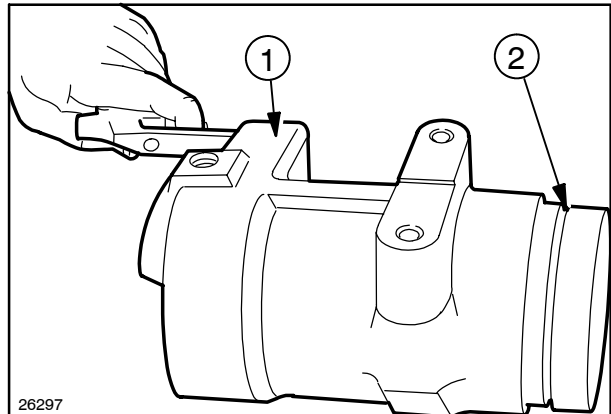
54

9. Using a brass drift, strike the end of the shaft (2), extract the shaft and the internal arm (1), the ring-cam and the seal (3).



55

10. Use compressed air to remove the piston (2) from its cylinder (1).

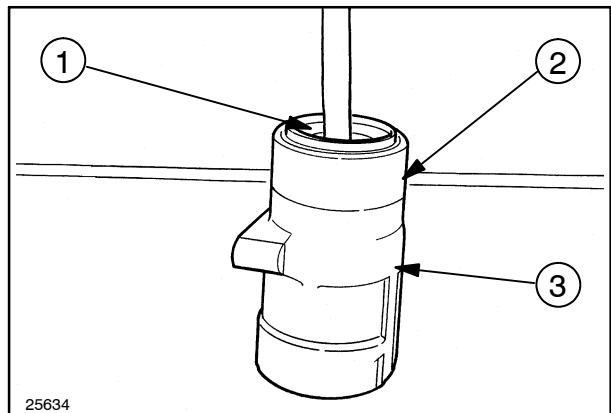


56

Assembly

To assemble the lift, proceed as follows:

1. Using tool **380001627** (1) insert the piston (3) in the cylinder (2).



57

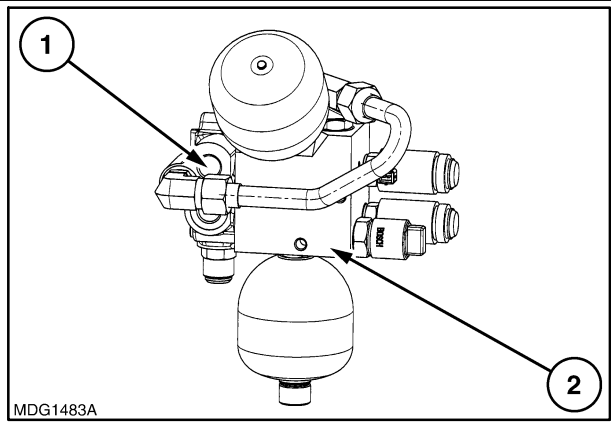
SPECIFICATIONS

MAIN SPECIFICATIONS OF FRONT MECHANICAL LIFT		
Type		in position control
Driving		lever located on right-hand side of operator
Single-acting cylinder:		
- quantity		2
- rated diameter and stroke:	mm (in.)	63 x 155 (2.48 x 6.10)
- rod diameter:	mm (in.)	28 (1.10)
- capacity:	cm ³ (cu. in.)	483 (190.16)
Operating pressure	bar (psi)	190 (2756)
Maximum pressure	bar (psi)	250 (3626)

MAIN SPECIFICATIONS OF ELECTRONICALLY CONTROLLED FRONT LIFT		
Type		pressure, mixed and position control
Lift lowering and raising adjustment		with the knobs on the right-hand side of the operator
Up/down buttons		allows fast lifting/lowering operations using push-button (B, fig. 22) or (1 and 2, fig. 24), without using the height and depth adjustment knobs
Front lift function		managed by an independent electronic control unit.
Single-acting cylinder:		
- quantity		2
- rated diameter and stroke:	mm (in.)	63 x 155 (2.48 x 6.10)
- rod diameter:	mm (in.)	28 (1.10)
- capacity:	cm ³ (cu. in.)	483 (190.16)
Operating pressure	bar (psi)	190 (2756)
Maximum pressure	bar (psi)	250 (3626)

ACCUMULATOR CONTROL VALVE

In parallel between the front electronic lift (1) and the cylinders there is a second control valve (2) with two solenoid valves, two accumulators (one 14 bar [203 psi] and the other 40 bar [580 psi]) and a pressure switch.



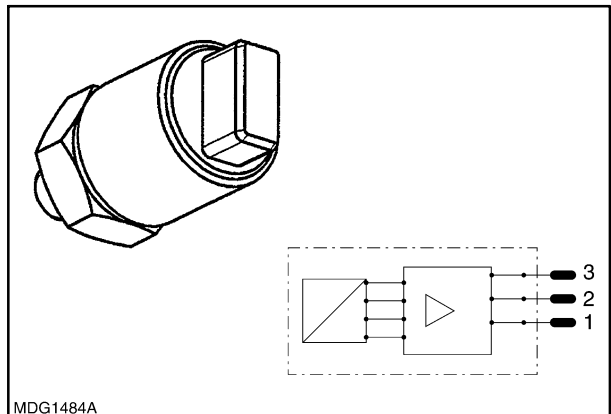
28

The pressure switch is constantly subjected to the loading pressure by the lifting cylinders and is used, by the control unit, as a signal transmitter for pressure control

The sensor is designed to withstand a pressure of from 0 to 200 bar (0 to 2901 psi), it is supplied, by the control unit, with a current of 9.5 V.

The output signal changes in proportion to the operating pressure to which it is subjected (it increases as the pressure increases).

1 - Ground, 2 - Signal, 3 - Supply (9.5V).

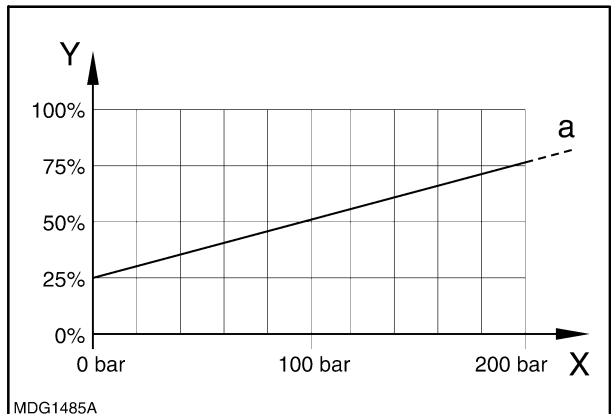


29

At a pressure of approximately 0 bar, the voltage signal (a) is approximately 25% of the supply voltage (approximately 2.4 V).

The voltage signal output from the sensor can come within a range of from 25% to 75% of the supply voltage.

Y - Supply (9.5 V = 100%), X - Pressure, a - Output signal

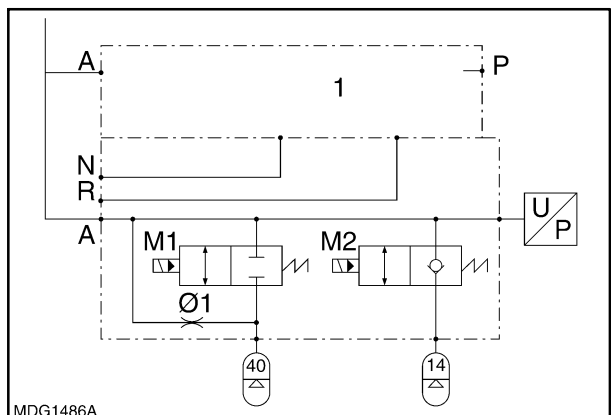


30

The two solenoid valves are coupled with the related accumulators: solenoid valve M2, in the neutral position, is connected with a check valve to the circuit and to the accumulator with 14 bar (203 psi).

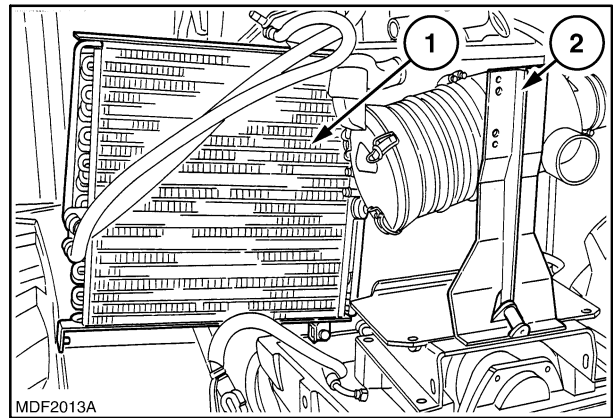
The solenoid valve M1 separates the circuit from the 40 bar (580 psi) accumulator: they are both connected by a constriction of $\varnothing 1$ mm.

A - Oil to the cylinders, N - Oil to the other services, P - Oil from the pump, R - Outlet, 1 - Front lift control valve.



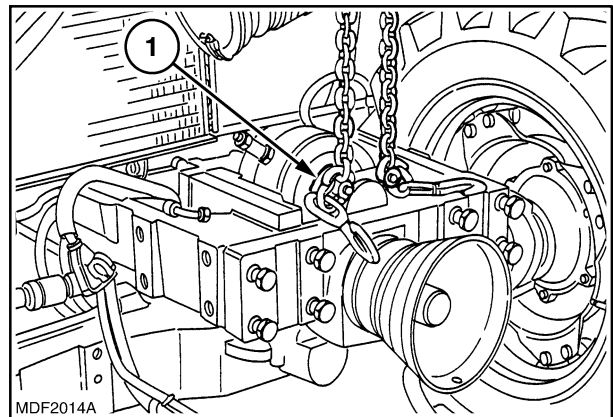
31

- Extract the condenser (1) of the air-conditioning system and remove the battery support (2).



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- Connect the front power take-off (1) to the hoist, unscrew the bolts fastening it to the front axle support and remove it.



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- Unscrew the relative retaining bolts and remove the flexible coupling (1).

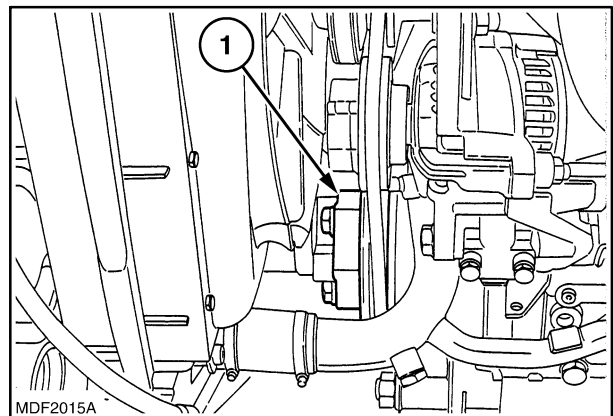
Installation


CAUTION


Use suitable tools to align the holes. NEVER USE FINGERS OR HANDS.

Install as follows:

- Position and secure the flexible coupling.
- Insert the power take-off in its seat and secure it.
- Position the battery support, secure it and fit the condenser of the air-conditioning system in front of the radiator.
- Connect the front PTO clutch control line.
- Position the battery in its seat and secure it; connect the cables to the battery.



60

Op. 41 204 30

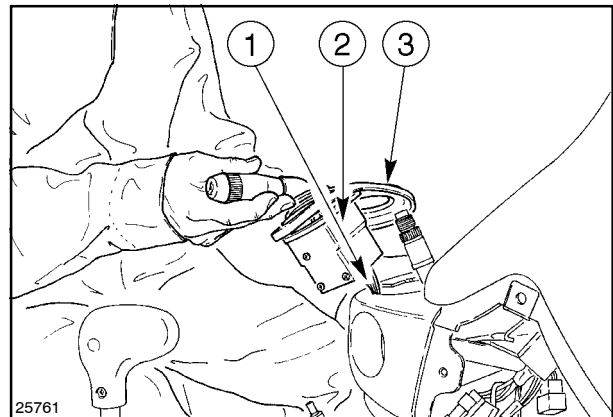
HYDROSTATIC STEERING CONTROL VALVE**Removal****WARNING**

Handle all parts carefully.

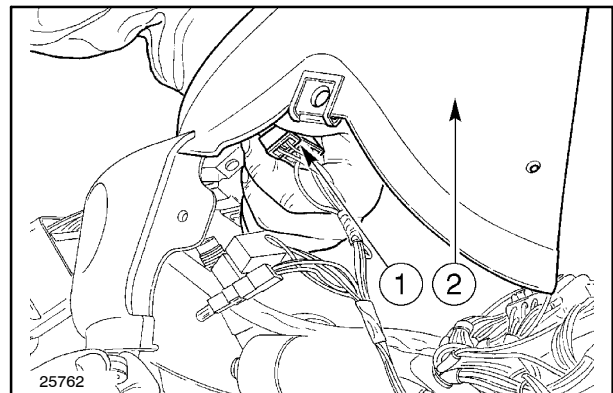
Do not put your hands or fingers between parts. Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

To remove the power steering control valve, proceed as follows:

1. Carry out operation **90 100 22** hood, only removal (see section 90).
2. For tractors with cabs, it is advised to remove the door stop pins in order to fully open the door and improve access during removal operations.
3. Carry out operation **90 110 14** Instrument panel lower guard, only removal (see Sect. 90).
4. Carry out operation **41 204 10** Hydrostatic steering wheel, only removal (see sect. 41).
5. Carry out operation **55 418 10** Multi-indicator panel, only removal (see Sect. 55).
6. Remove the retaining bolts on the dashboard, detach the electrical connections (1), the light control switch (2) from their seats, complete with the dust guard (3).
7. Remove the electrical connections (1) connected to the dashboard and remove the dashboard (2).

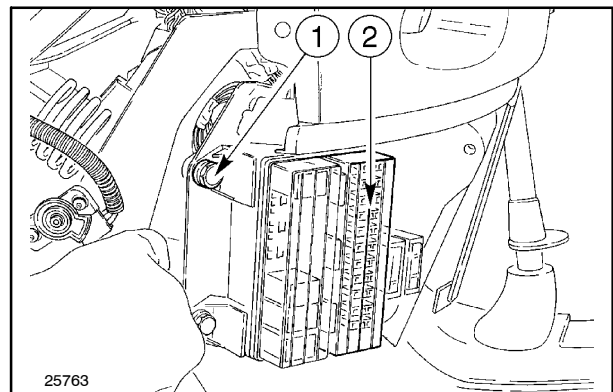


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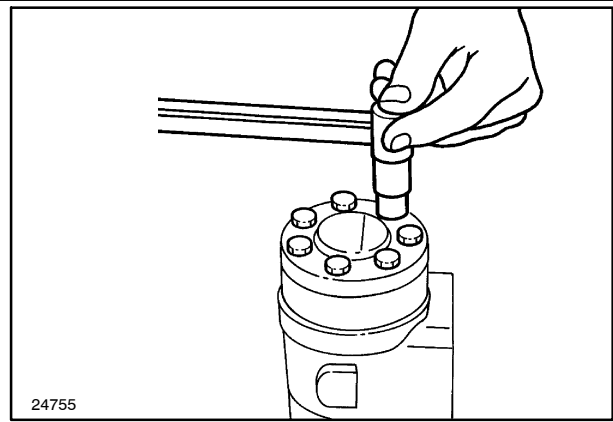
7

8. Remove the four retaining bolts (1) on the fuse box (2) support.



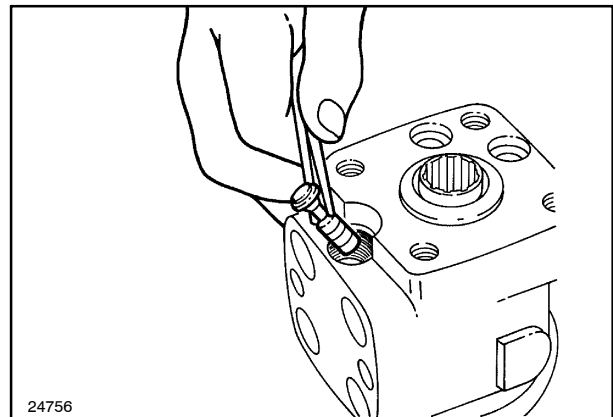
8

36. Fit the other six cover retaining bolts with the washers and tighten in diagonal sequence to the torque setting value shown in the table on page 2.



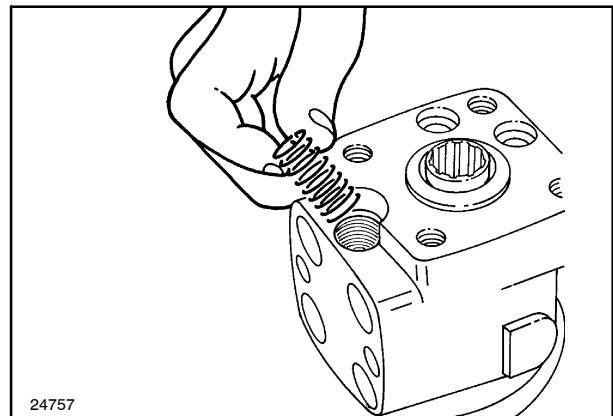
66

37. Turn over the control valve body and insert (see component details in fig. 38) the pressure relief valve piston in the seat indicated in the drawing.



67

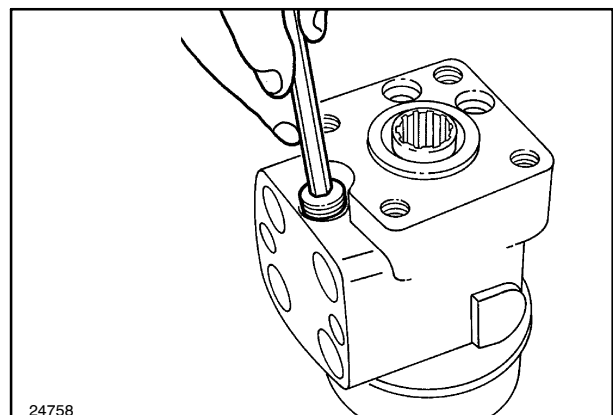
38. Insert the pressure relief valve spring.



68

39. Using an 8 mm Allen wrench, insert the pressure relief valve calibration screw.

NOTE: calibration will be carried out on the workbench or on the tractor to the values shown in the table on page 2.



69

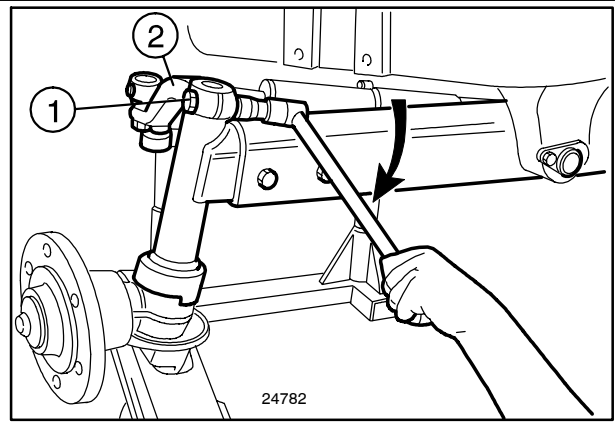
SECTION 44 - AXLES AND WHEELS

Chapter 1 - Axles and Wheels

CONTENT

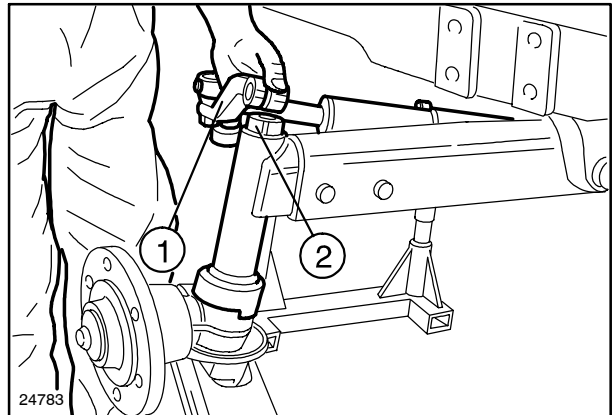
Section	Description	Page
	Specifications	2
	Sectional Views	4
	Torque	5
	Special Tools	8
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	Overhaul	10
44 101 22	Front Axle Hub	10
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	Removal	13
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	Removal	16
	Installation	18
44 511 80	Checking The Alignment of the Leading Wheels	20

5. Position a hydraulic jack under the stub axle and unscrew the bolt (1) securing the control lever (2) to the stub axle pin.



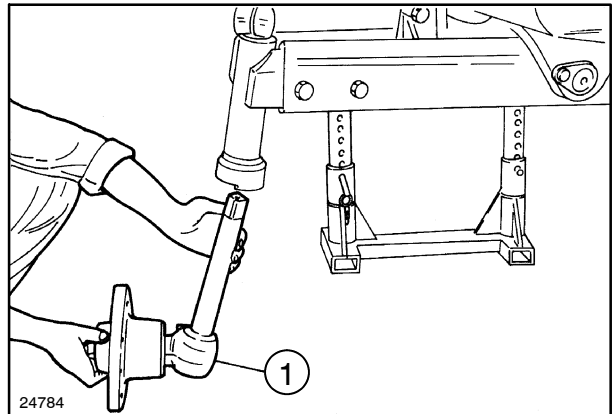
30

6. Extract the control lever (1) from the stub axle pin (2).



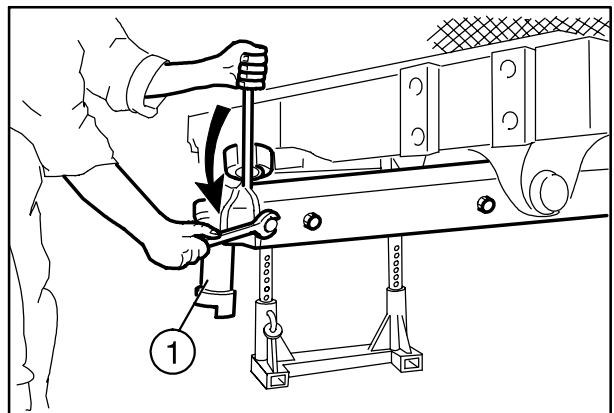
31

7. Lower the hydraulic jack and remove the stub axle (1)

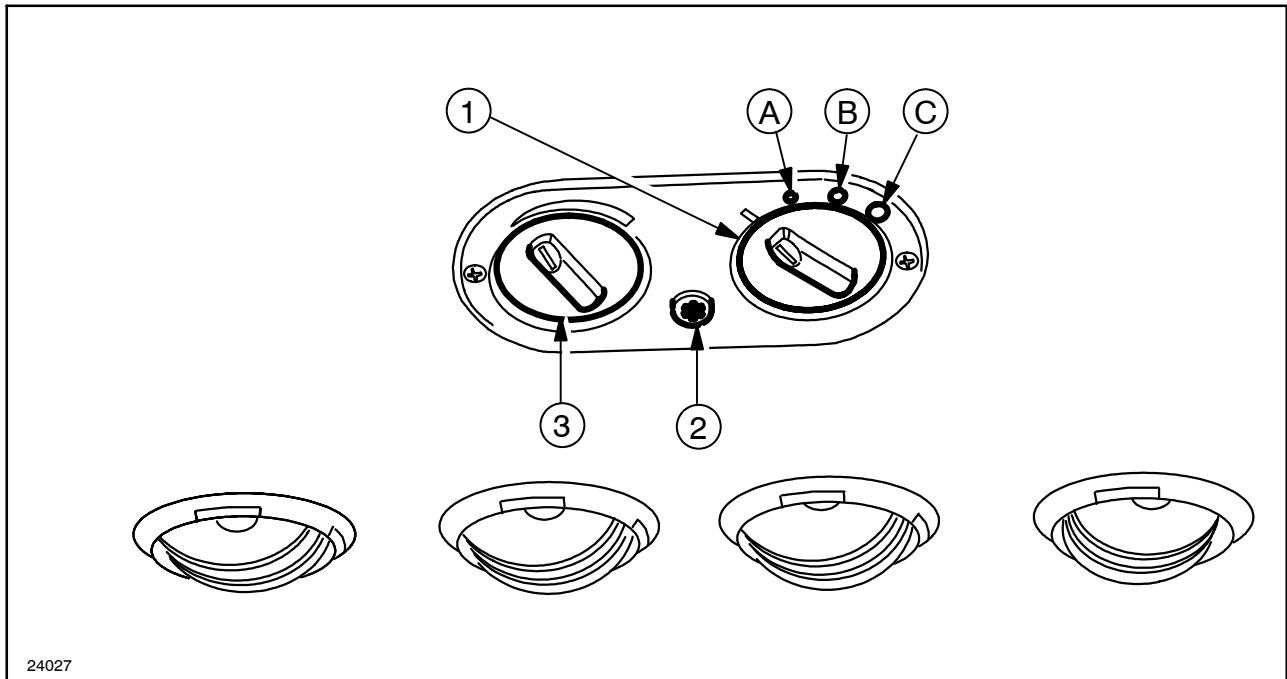


32

8. Unscrew the bolts securing the axle end (1).



33



13

CAB AIR CONDITIONING AND TEMPERATURE CONTROLS

Air Conditioning and Temperature Control Button

The system operates with the ignition key switched on.

With the electric fan knob (1) in positions A-B or C, turn the knob (2) to switch on the air conditioning.

Heater Control Knob

For maximum temperature, turn the knob (3) clockwise (fully to the right).

To shut off the water supply to the heater and switch off the heater, turn the knob (3) fully counter-clockwise.

3-speed Electric Fan Control Knob

Functions when the ignition switch is in the starting position (B, fig. 12)

- A. Low speed.
- B. Medium speed.
- C. High speed.

NOTE: To pressurize the cab, see the **Ventilation** chapter on page 11 in this Section

47. Rotate the outer casing (30) so that pressure value indicated on the graduated scale corresponds with the value shown on pressure gauge (2).
48. When the refrigerant in the cylinder has reached the required level, as indicated on the glass rod (29), close the cock of the external cylinder, the cock on the charging pipe (24) and cock (27).

NOTE: If excessive time is required to transfer refrigerant from the external cylinder to cylinder (31), slightly open valve (1) and discharge air from the cylinder (31); the pressure reading on pressure gauge (2) should not exceed 5 bar.

Evacuation of the Cab Air Conditioning System (Previously Discharged Using the Recovery/Recycling Station)

49. Remove the caps from the service valves on the suction and discharge lines of the compressor.

Refer to figure 18, proceed as follows:

50. Connect the blue service pipe (17) to the valve on the low pressure side of the compressor marked "S".
51. Connect the red service pipe (15) to the valve on the high pressure side of the compressor marked "D".
52. Open the quick-fit cocks (16).
53. Open cocks (4 - 9 - 10 - 22).
54. Start the pump by turning switch (19) to position "I" and evacuate the system for at least thirty minutes; pressure gauges (5 - 6 - 8) should show a negative reading. If the evacuation operation is not performed correctly, check all connections.
55. Close cock (9), switch off the pump by turning switch (19) to position "0" and check the vacuum seal for at least five minutes using vacuum meter (8). Then close all cocks.

Charging the Cab Air Conditioning System (After Evacuation) With New Oil

If no refrigerant leaks, whether major or minor, have ever been found in the system, on recharging, replace the contaminated oil previously recovered in operations (25 and 26) with new oil. If, on the contrary, significant leaks have occurred in the past, proceed with the compressor oil level check procedure as previously described.

Refer to figure 18, proceed as follows.

56. Pour the oil into the graduated oil meter.
57. Connect the oil meter to the oil meter (20).
58. Close cocks (4 and 10).
59. Set switch (19) to position "2" to switch on the refrigerant heater on cylinder (31).
60. Open cock (12) and the cock on the graduated oil meter.
61. Check the quantity of oil flowing from the oil meter, and once the required quantity has been reached, close cocks (12) and the cock on the oil meter, and remove the graduated meter.

Charging the Cab Air Conditioning System With Refrigerant (After Evacuation)

NOTE: The quantity of refrigerant required to be introduced into the system is 800 grams (R134a refrigerant).

Refer to figure 18, proceed as follows:

62. Keep switch (19) in position 2, with the refrigerant heater in cylinder (31) on, and heat the refrigerant for approx. 10 to 15 minutes to facilitate transfer from the cylinder to the tractor air conditioning system.
63. According to the refrigerant type, rotate the outer casing (30) so that the graduated scale and the pressure values correspond with the pressure reading on gauge (2).
64. Move the external ring (26) along the cylinder glass to mark the quantity of refrigerant to be charged.
65. Open cock (22) and charge from the high pressure side.
66. Open cock (3), charge approx. 300 grams of refrigerant, close cock (3) and check for leaks.
67. If there are no leaks, continue charging up to the prescribed quantity.
68. On completion of charging operations, turn switch (19) to position "0", close cocks (3 and 22), disconnect pipes (15 and 17) and replace the caps on the service valves.

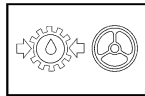
Carry out functional tests with the system set to maximum performance levels, as described below.

19. **Handbrake** (red)

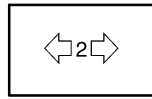
Indicates that the handbrake is on (with starter key inserted). It blinks with the ignition key on STOP and the handbrake disengaged

20. **Grid Heater** (amber)

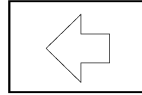
The indicator lights up when the grid heater is turned on by the ignition key.

21. **Power steering oil pressure** (red)

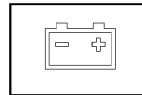
The light should go out a few seconds after the engine is started. With the engine running at minimum revs and the tractor stationary, the light may come on without indicating a problem.

22. **Second trailer direction indicator** (green)

Flashes at the same time as the tractor turn indicators, if connected.

23. **Left direction indicator** (green)

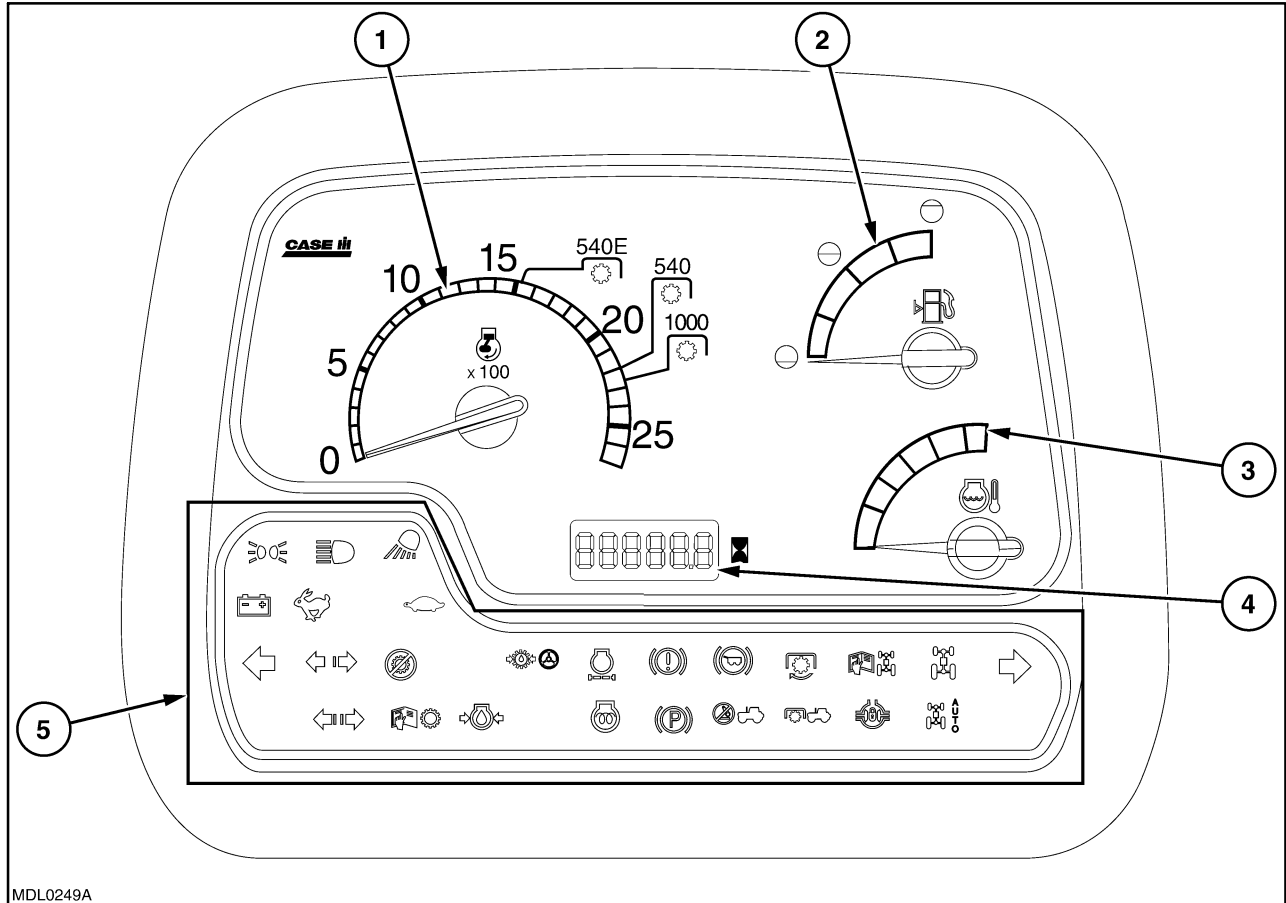
Flashes at the same time as the left-hand turn indicators.

24. **Abnormal battery charging system operation** (red)

It should go out once the engine starts. If the light stays on when the engine is running, stop and find the cause of the problem.

May light up when the engine is idling, but does not necessarily indicate a fault.

ANALOG CONTROL PANEL



1

1. Tachometer.
2. Fuel gauge.
3. Engine coolant temperature gauge.
4. Hours worked counter.
5. LED indicators to signal machine service status.

OVERHAUL

SYSTEM TESTS

Starting System Test on Tractor

To troubleshoot the starting system simply and rapidly with conclusive results, use a battery/starter tester (high discharge rate tester) with incorporated 0 to 20 V voltmeter and 0 to 500 A ammeter.

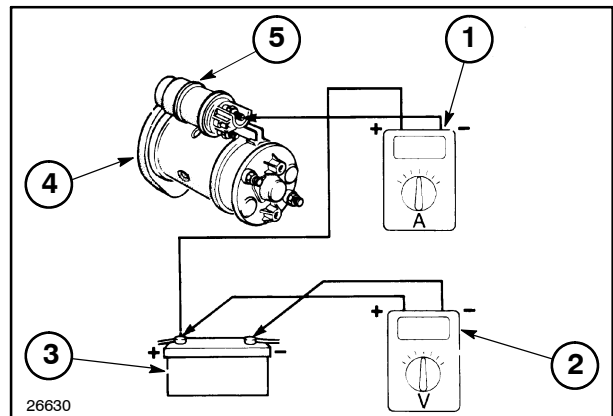
When using testing devices, follow test procedures recommended by the manufacturer. If testing devices are not available, carry out the following procedure using a standard 0 to 20 V voltmeter and a 0 to 500 A ammeter to check correct starter motor operation, without removing it from the engine.

Before the test:

- Check that the battery is fully charged
- Check the condition of all the starting system wiring (no damaged or frayed wires, no loose connections).
- Check that the engine is not seized.

Current Absorbed on the Starter Motor Circuit

1. Disconnect the battery (3) ground cable (negative).
2. Disconnect the positive battery cable from the starter electromagnet (5). Connect the positive lead of an ammeter (1) to the positive battery terminal and the negative lead to the electromagnet input terminal (5).
3. Reconnect the ground wire (negative) to the battery negative terminal (3).
4. Connect the positive voltmeter point (2) to the positive battery terminal clamp and the negative to the negative battery terminal clamp.

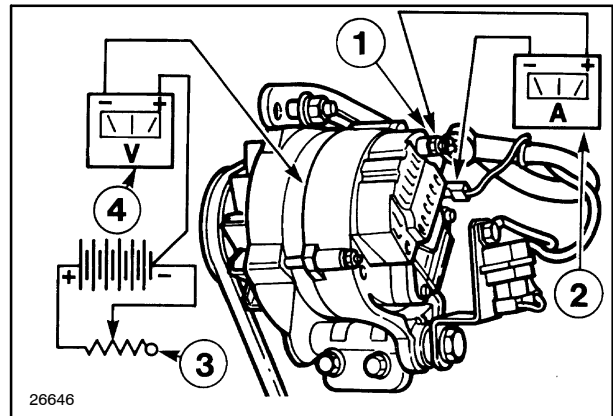


(b) Ground side voltage drop test

Refer to figure 8.

1. Make sure that the starter key is in the OFF position.
2. The circuit is the same as that described in the previous test, except that the millivoltmeter (4) is now connected between the negative battery terminal and the alternator casing (negative side of the casing).

NOTE: Make sure that the variable load resistance (3) is in the minimum current absorption position (maximum resistance).



8

3. Start the engine and increase speed to 2000 rev/min.
4. Gradually increase the resistance charging load (decreasing the resistance) until the ammeter (2) indicates 45 or 65 A, according to the type of alternator.
5. Note the reading on the millivoltmeter, which should not exceed 200 millivolt.

Readings higher than 200 millivolt indicates a fault due to excessive resistance on the external circuits.

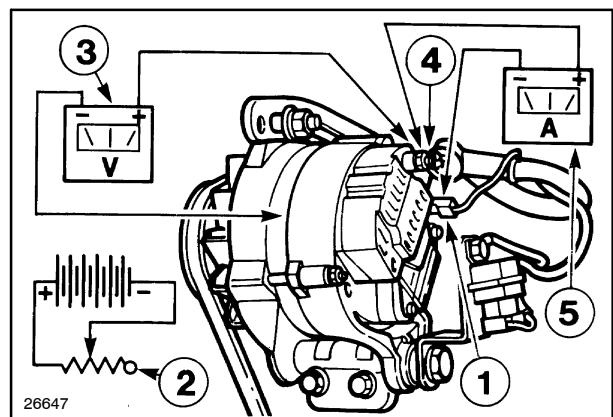
If the alternator cannot produce the requested output and the reading on the millivoltmeter is lower than 200 millivolt, there is a faulty component in the alternator. Carry out the alternator component tests as described in this section.

6. Stop the engine.

MAXIMUM ALTERNATOR OUTPUT TEST

Refer to figure 9.

1. Make sure that the starter key is in the OFF position.
2. Disconnect the negative battery cable and the alternator B+ wire (4).
3. Connect an ammeter (5) between the B+ alternator terminal (4) and the D+ wire (1) (negative side of the wire).
4. Connect a voltmeter (3) between the alternator B+ terminal (4) and earth (ground).
5. Reconnect the battery, start the engine and increase speed to 2000 rpm.
6. Gradually increase the resistance charging load (2) (decreasing the resistance) until the ammeter indicates 45 or 65 A, according to the type of alternator.
7. Note that the voltmeter reading does not fall below 13.6 V.



9

Testing

Before beginning battery tests, check that the breathers are not blocked, there is no rust, the breather caps are not open and the casing is not cracked.

Equipment required for testing:

- Densimeter
- Battery starter tester (high amperage multi-tester)
- Thermometer
- Battery charger

Relative density: This test shows the charge level of the battery.

1. With the float in the vertical position, note the reading.
2. Adjust the densimeter reading for battery electrolyte temperature variations, subtracting 4 points (relative density 0.004) for every 5.5°C below the calibrated temperature of the densimeter and adding 4 points (relative density 0.004) for every 5.5°C above this temperature.

The following examples have been calculated with a densimeter calibrated at 30°C.

Example 1:

Temperature lower than	30°C
Battery electrolyte temperature	19°C
Densimeter reading	1.270
Subtract 11.0×0.004	
<u>5.5</u>	

Correct relative density = 1.262

Example 2:

Temperature above	30°C
Battery electrolyte temperature	40°C
Densimeter reading	1.220
Add 10.0×0.004	0.007
<u>5.5</u>	

Correct relative density = 1.227

3. Use the following table to determine the charge level.

Charge level	Corrected Specific Gravity at 15°C	Corrected Specific Gravity at 25°C	Average battery voltage
100%	1.295	1.287	12.66
75%	1.253	1.246	12.45
50%	1.217	1.210	12.30
25%	1.177	1.170	12.00
Discharged	1.137	1.130	11.84

NOTE: The relative density should not vary more than 0.025 points between cells.

4. If the relative density is 1.280 or more, the battery is fully charged and in good working condition.
5. If the relative density is less than 1.280, charge the battery and check the charging system to determine the cause of the low charge.

NOTE: If distilled water has been added recently, recharge the battery for a short time, otherwise the densimeter will not provide precise readings.

If the battery has been charged under static conditions, a thicker electrolyte will accumulate at the bottom of the elements. The battery must be shaken at regular intervals in order to mix the electrolyte: this will improve the charging amperage and provide more precise densimeter readings during the tests.

Performance tests

The performance test helps us to understand if the battery can adequately start the engine. Voltage readings show the battery condition. Before carrying out the test, check the battery electrolyte level is correct and the open circuit voltage is 12.5V or more. The battery can be tested in the tractor or removed.

1. Switch the battery start tester current control to OFF (high amperage discharge tester). Calibrate the voltage selection switch to the rated battery voltage, or slightly higher. Connect the positive tester conductors to the positive terminal on the battery and the negative conductors to the negative battery terminal.
2. Turn the current control knob until the ammeter reading reaches half the cold start battery amperage and note the voltage reading.
 - If the reading shows 9.6 V or more after 15 seconds, the battery has adequate power output and can be easily charged following the normal procedure.
 - If the reading is below 9.6 V, the battery is not satisfactory for use and must be tested as described below.



WARNING



Do not leave high discharge on the battery for more than 15 seconds.

COMPONENT LIST - NUMERIC ORDER (cont.)

C-180	Rear lights connection (6 PIN)
GND-181	Trailer brake circuit ground
SEN-182	Transmission oil pressure sensor
SW-183	Dual Command (2 Speed Power Shift) and Dump Clutch buttons
C-184	LH cab SMV light connection
C-185	RH cab SMV light connection
SEN-203	Shuttle position sensor
MOD-204	Four-wheel drive control unit
SW-205	Front lift UP external control switch
SW-206	Front lift DOWN external control switch
SEN-208	Front PTO sensor
LMP-210	Number plate light
SW-211	4WD indicator switch
LMP-212	Number plate light
LMP-213	RH two-faced headlight
LMP-214	LH two-faced headlight
GND-215	Power sockets ground

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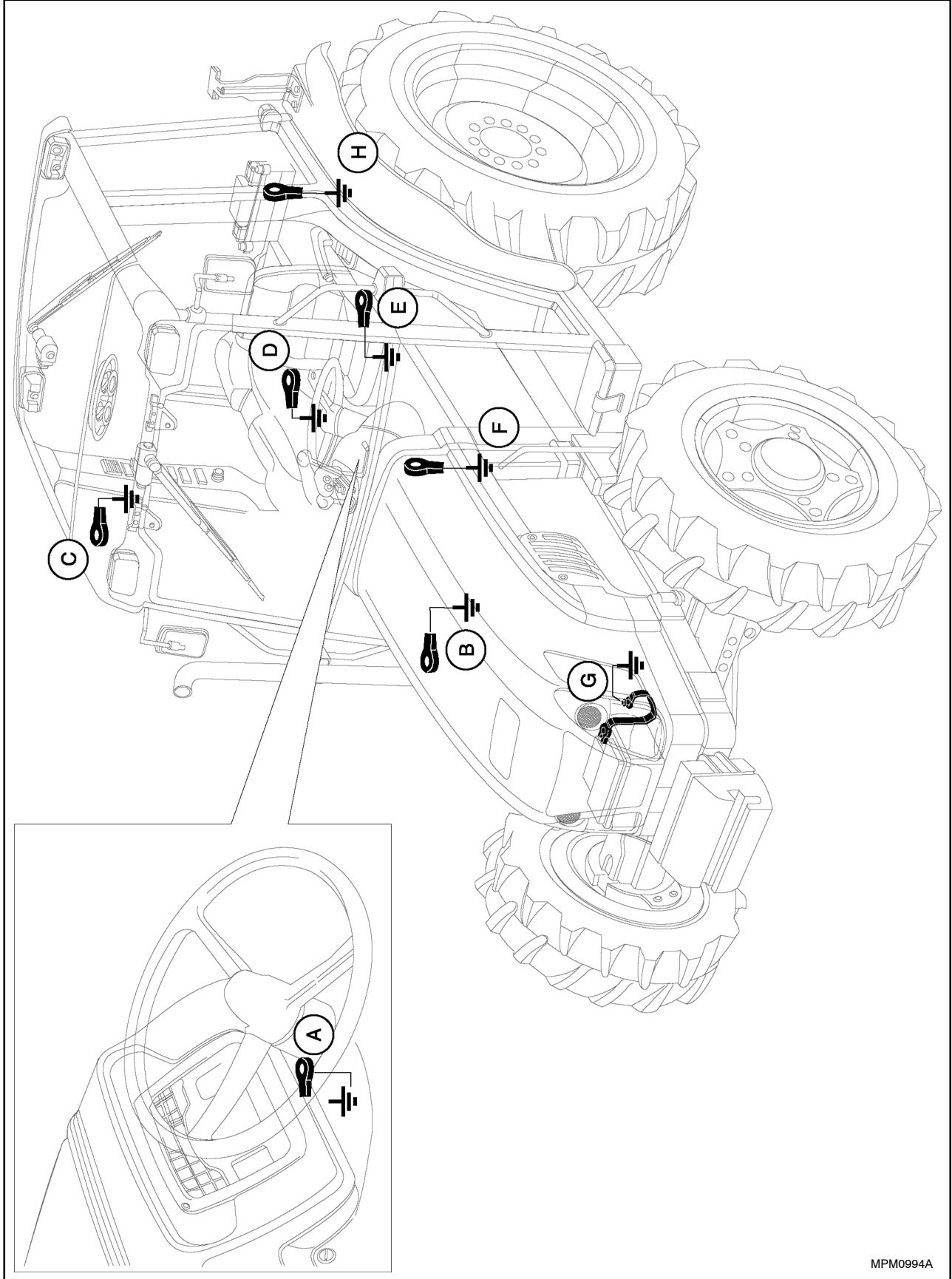
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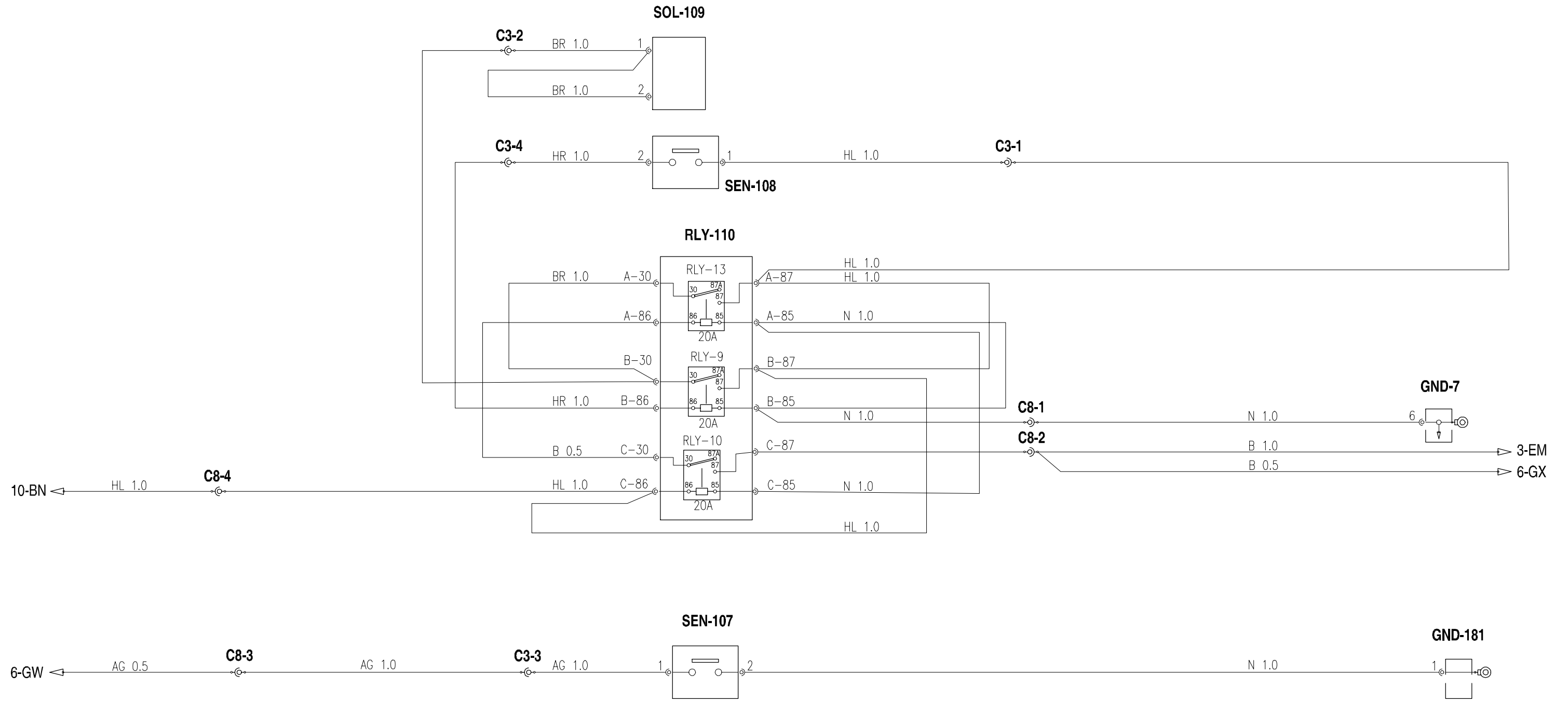
Ground Points Layout



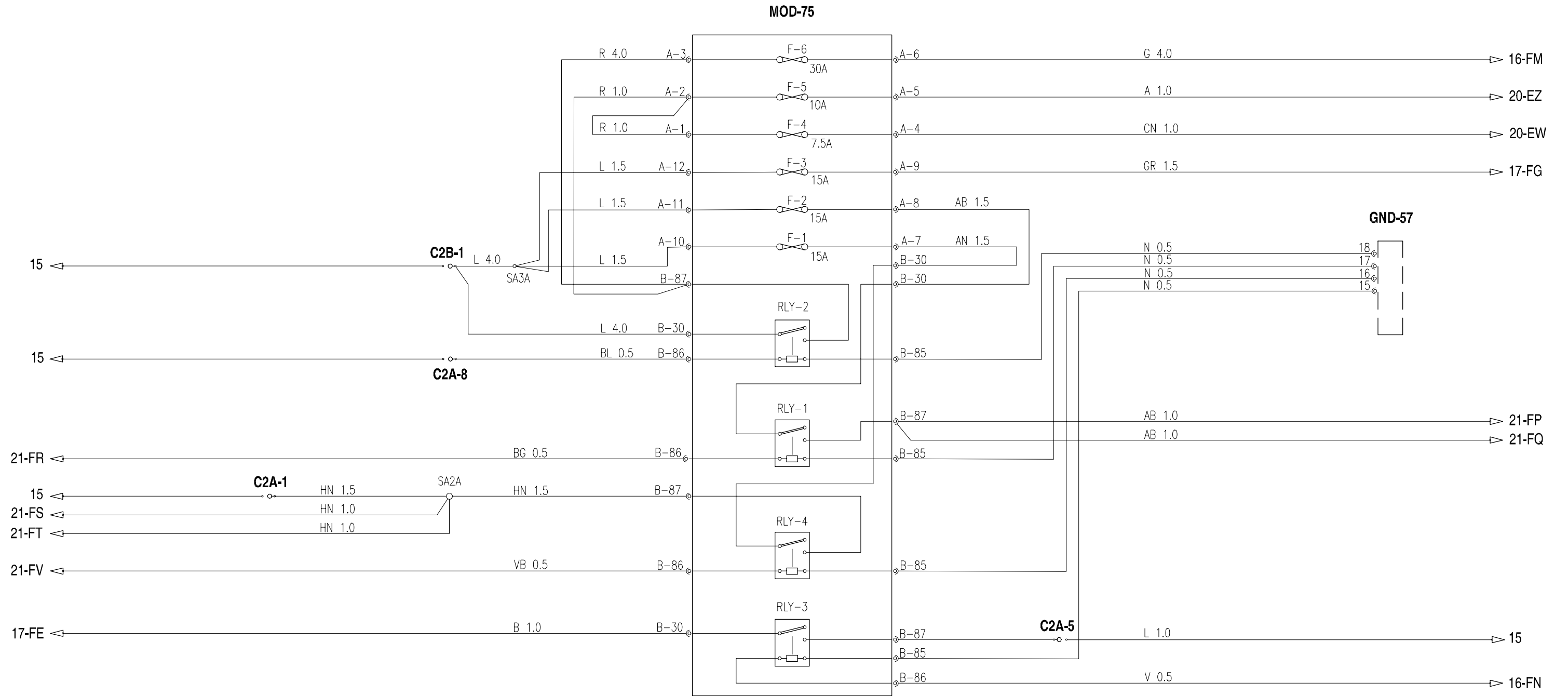
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LMP-119	9	Grille LH front work light
LMP-120	9	Front LH headlamp
LMP-121	9	Front RH headlamp
LMP-122	9	Grille RH front work light
SEN-123	6	Fuel level transmitter
SEN-129	14	Advance speed sensor
SEN-130	6	Power take-off rpm sensor
SOL-135	7	Four-wheel drive solenoid valve
SW-136	3	Stoplamp switch
SOL-138	25	HI-LO mode solenoid valve
SOL-139	25	Shuttle mode solenoid valve
SOL-140	23, 25	Dump solenoid valve
SW-141	23, 25	G1 ranges switch
SW-142	23, 25	C1 gears switch
SW-143	25	Creeper switch
SOL-146	23, 25	Lo clutch solenoid valve
SOL-147	23, 25	Hi clutch solenoid valve
SEN-148	23, 25	Transmission oil temperature sensor
MOD-150	22, 24	Power Shuttle control unit
SW-151	22, 24	Clutch pedal switch
SW-152	22, 24	Power Shuttle control lever
SEN-153	22, 24	Clutch pedal sensor
GND-155	22, 24	Dashboard Power Shuttle ground
MOD-156	5	Grid heater electronic module
RLY-157	5	Grid heater relay (coil)
RLY-158	5	Grid heater relay (contact)
RES-159	5	Grid Heater
F-160	5	125A Maxi-fuse
C-166	3	Brake lights signal test connection
C-167	22, 24	Connection for CAN line (4 PIN)
F-168	13	50A mega-fuse
F-169	13	50A mega-fuse
C-175	7	Four-wheel drive system connection (4 PIN)
SEN-176	14	Engine rpm sensor
GND-181	12	Trailer brake circuit ground

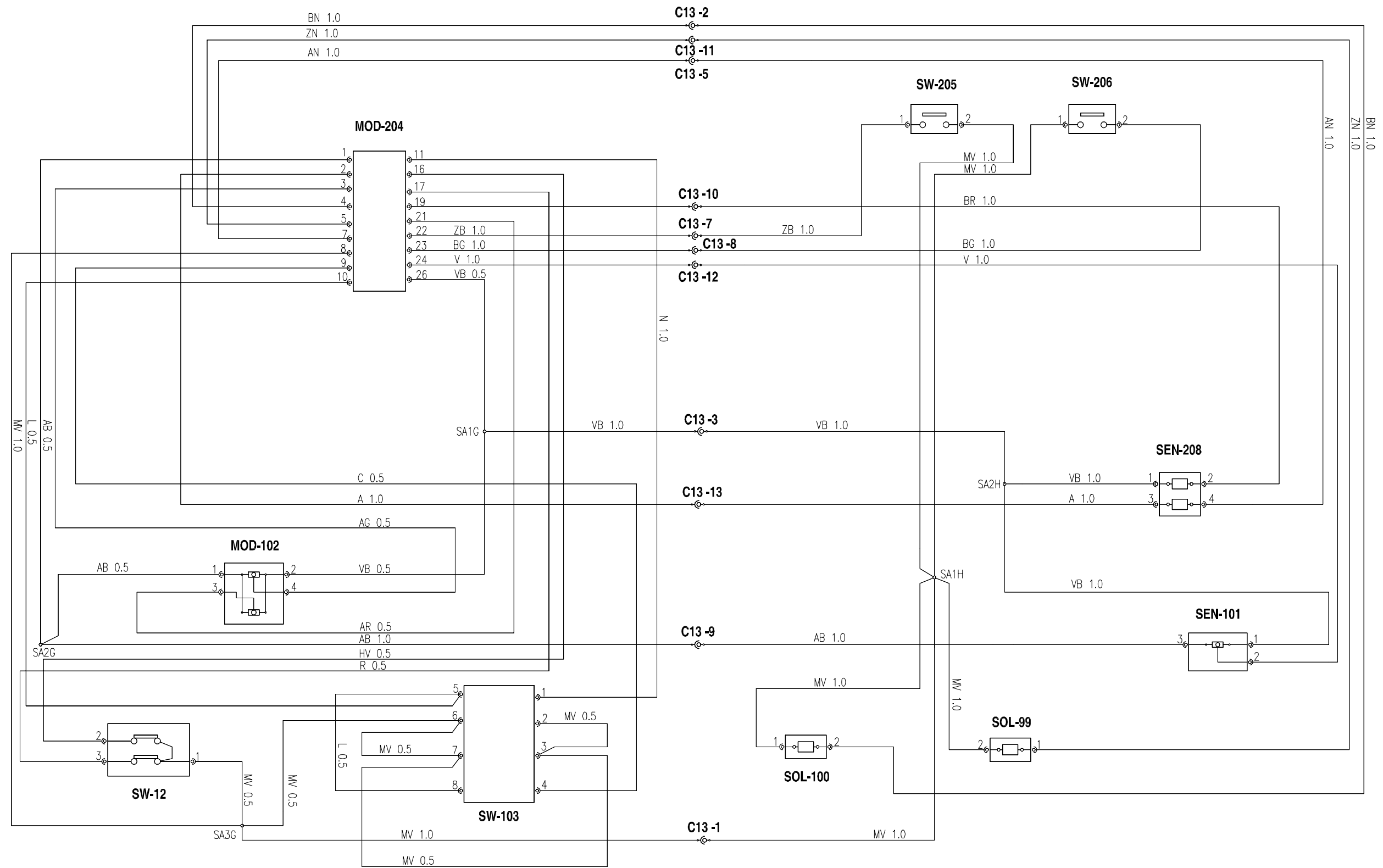
TRAILER BRAKE CIRCUIT - DIAGRAM 12



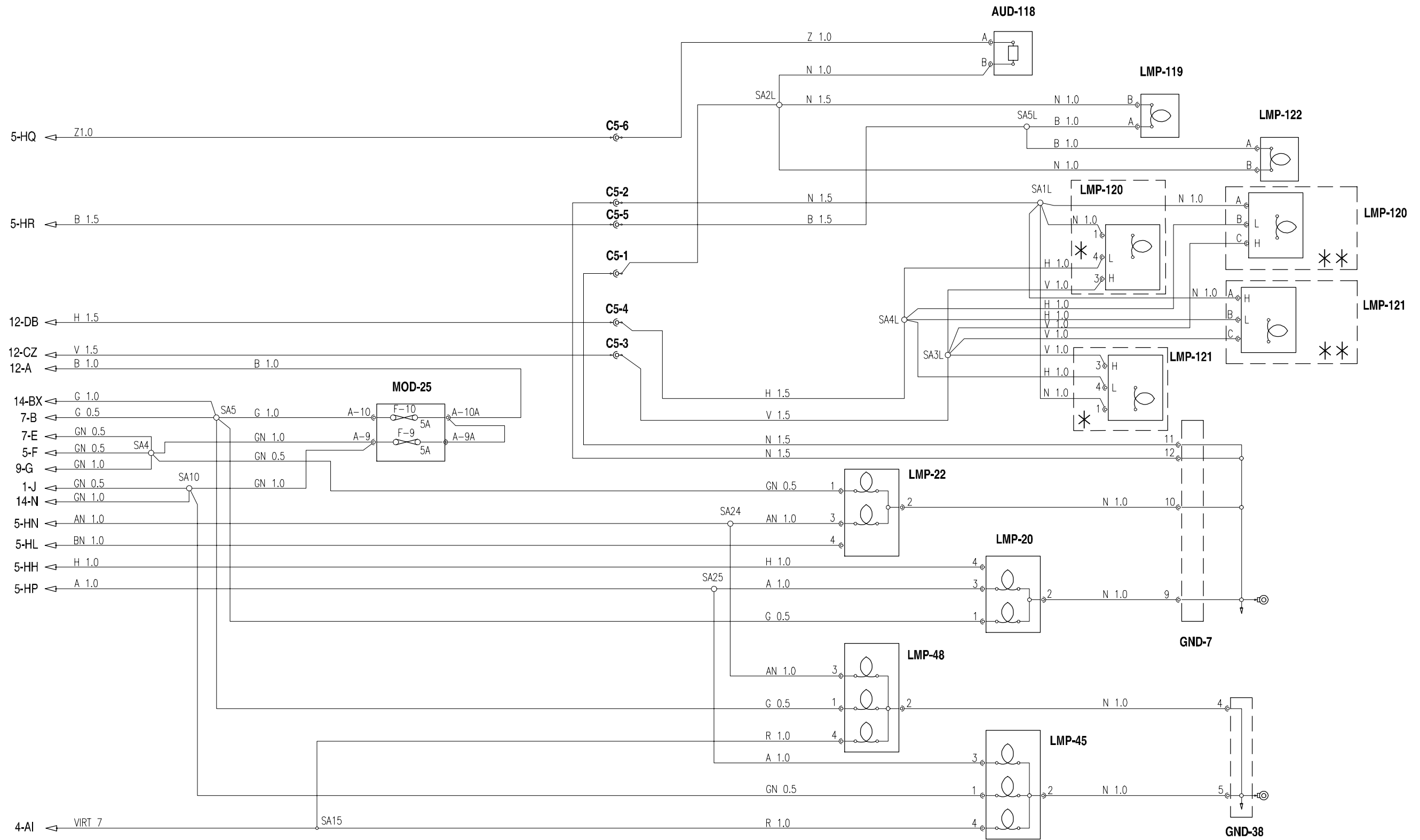
CAB POWER SUPPLIES CIRCUIT - DIAGRAM 19



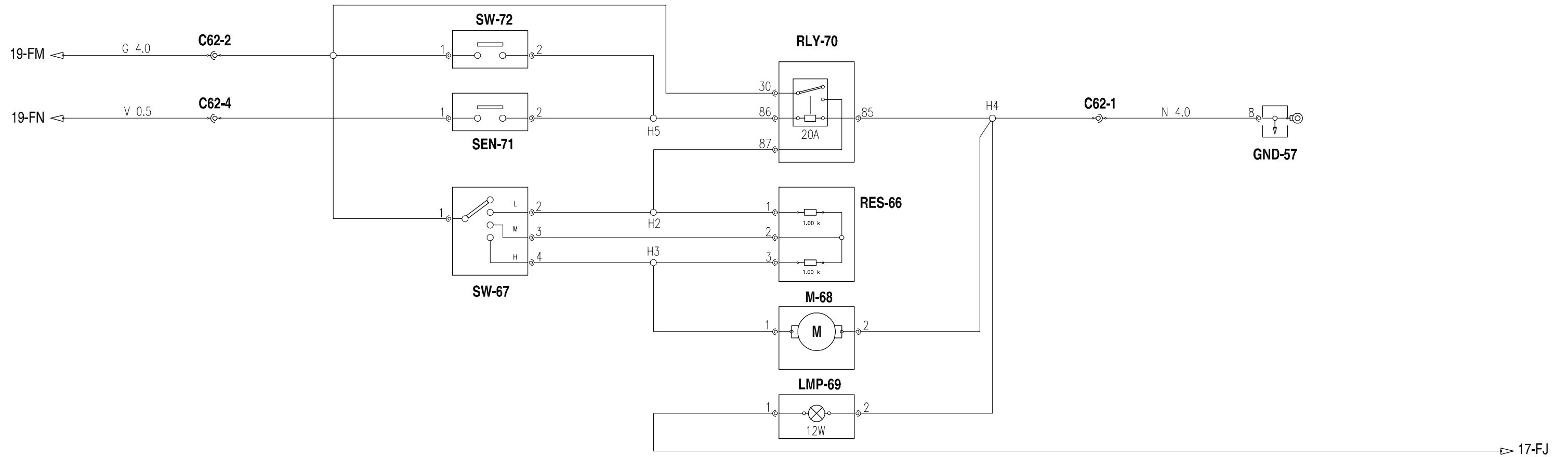
FRONT PTO CIRCUIT - DIAGRAM 26



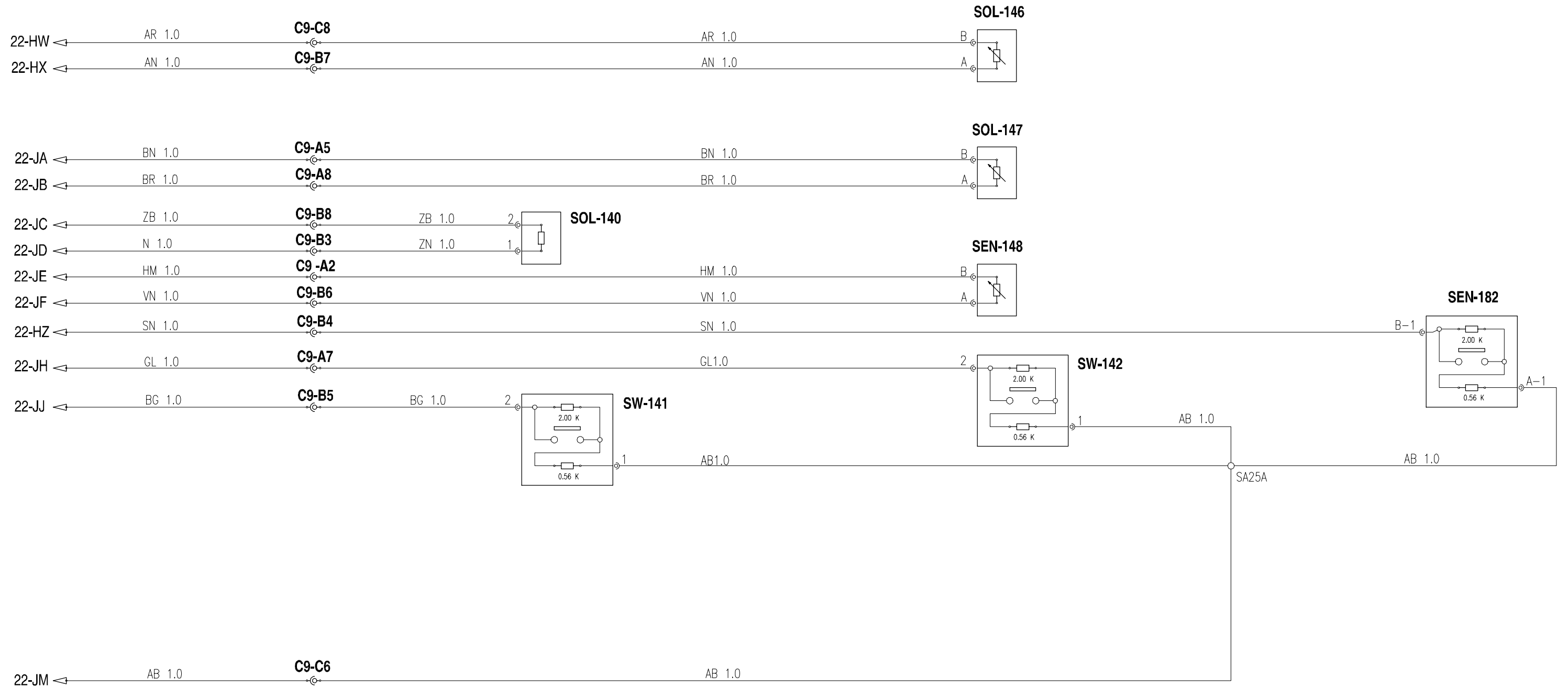
EXTERNAL LIGHTS AND HORN CIRCUIT - DIAGRAM 10



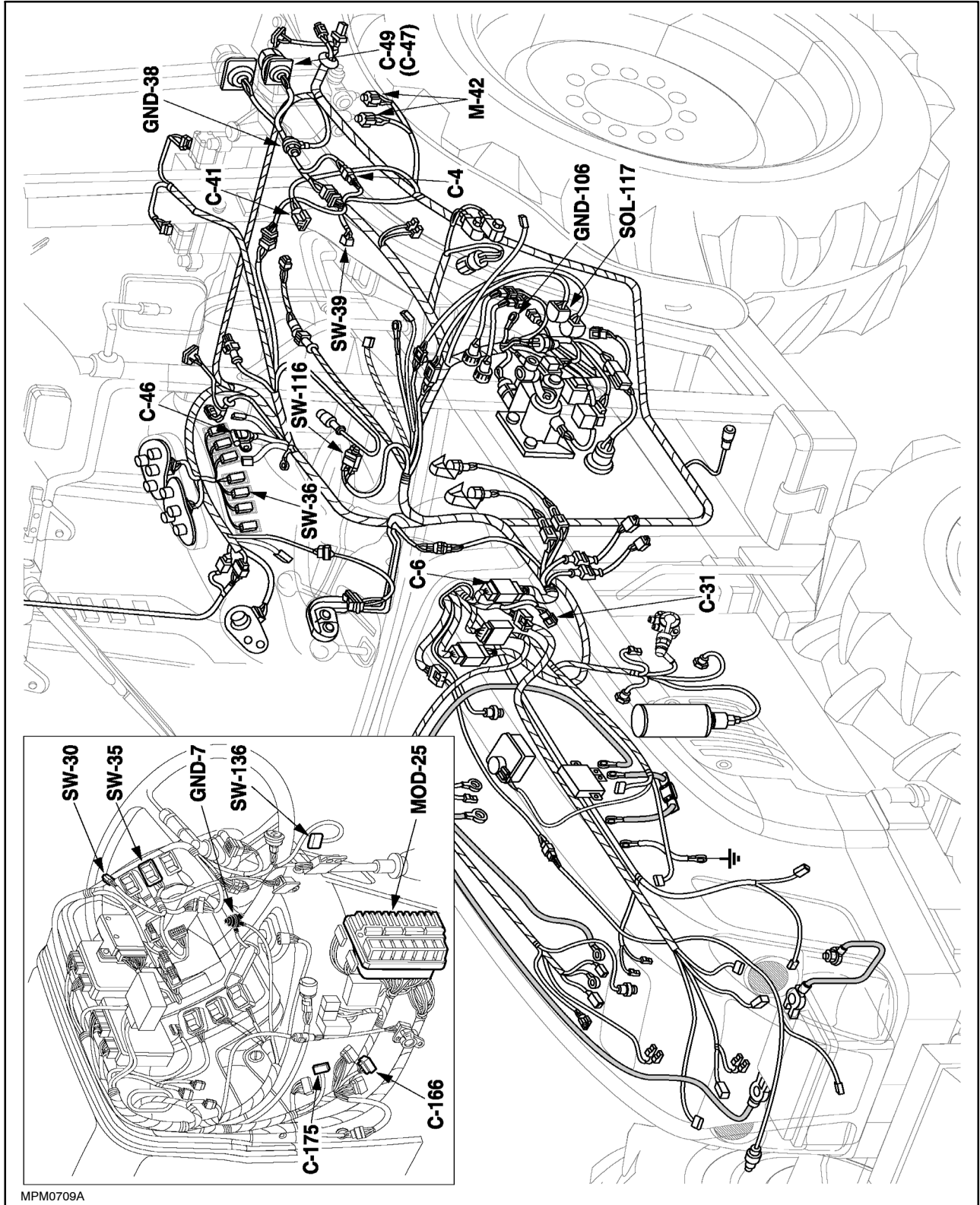
CAB VENTILATION AND AIR-CONDITIONING CIRCUIT - DIAGRAM 16



POWER SHUTTLE CIRCUIT (transmission side) - DIAGRAM 23

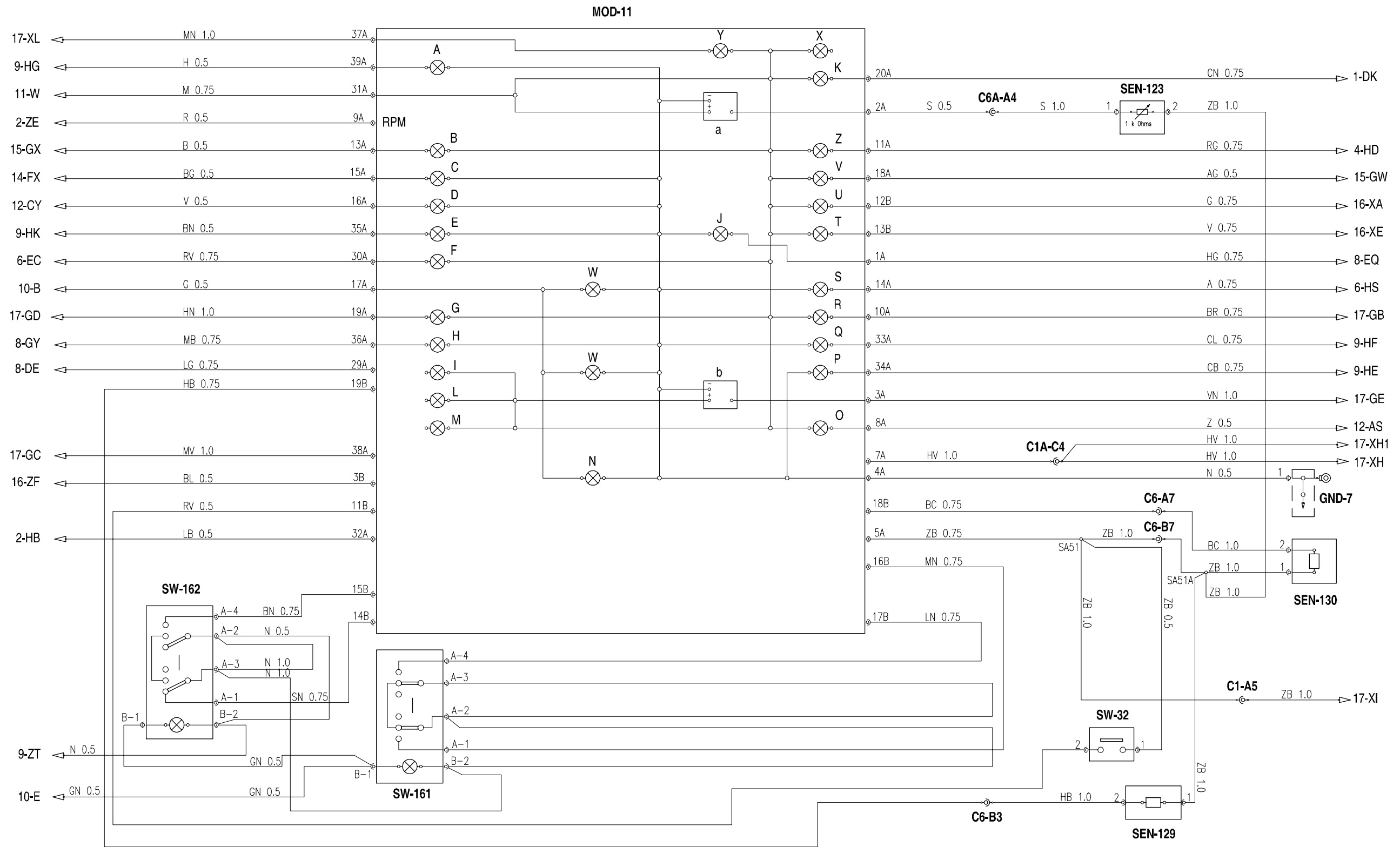


COMPONENT LOCATIONS - DIAGRAMS 1 THROUGH 4

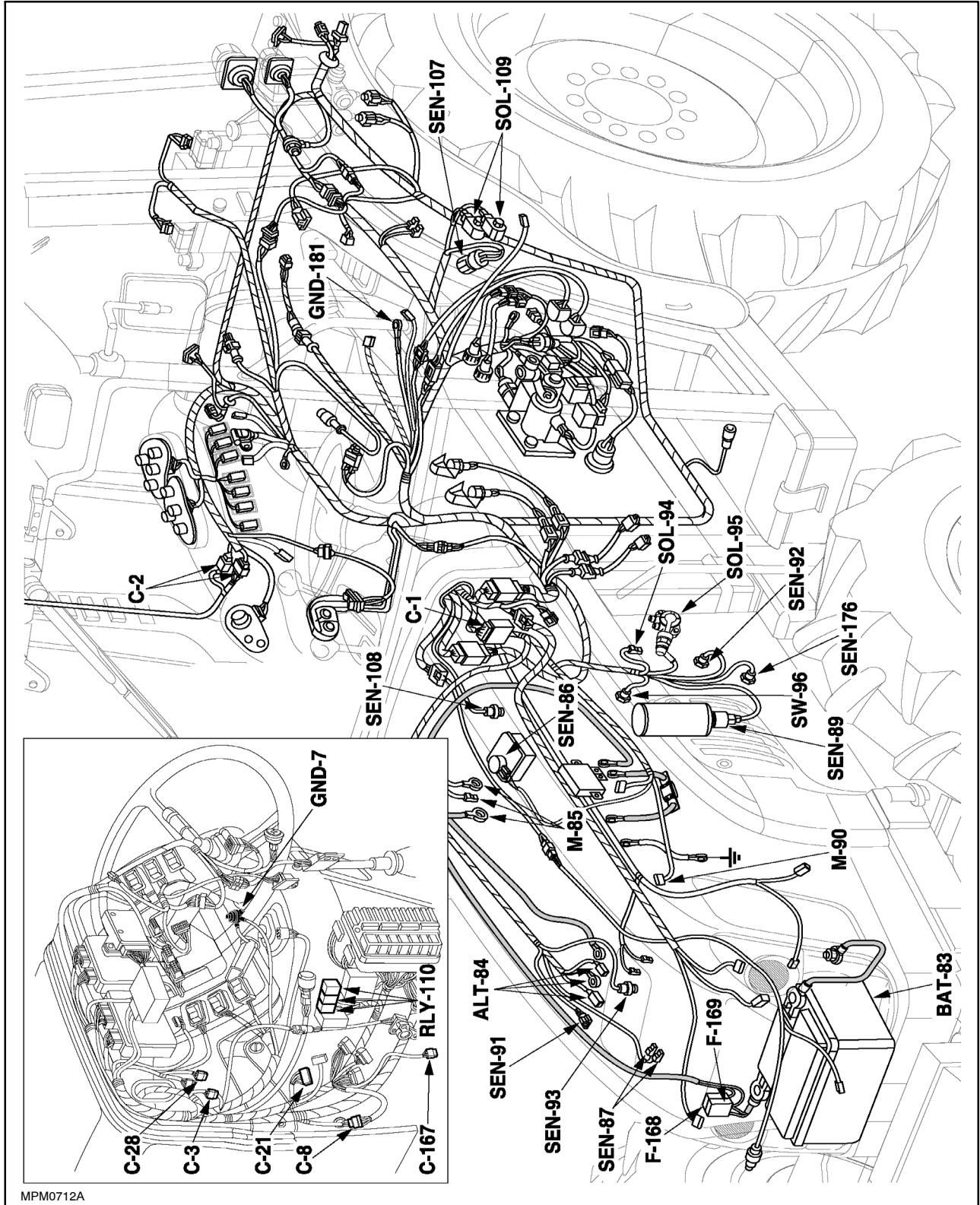


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INSTRUMENT AND SENSOR CIRCUIT - DIAGRAM 7

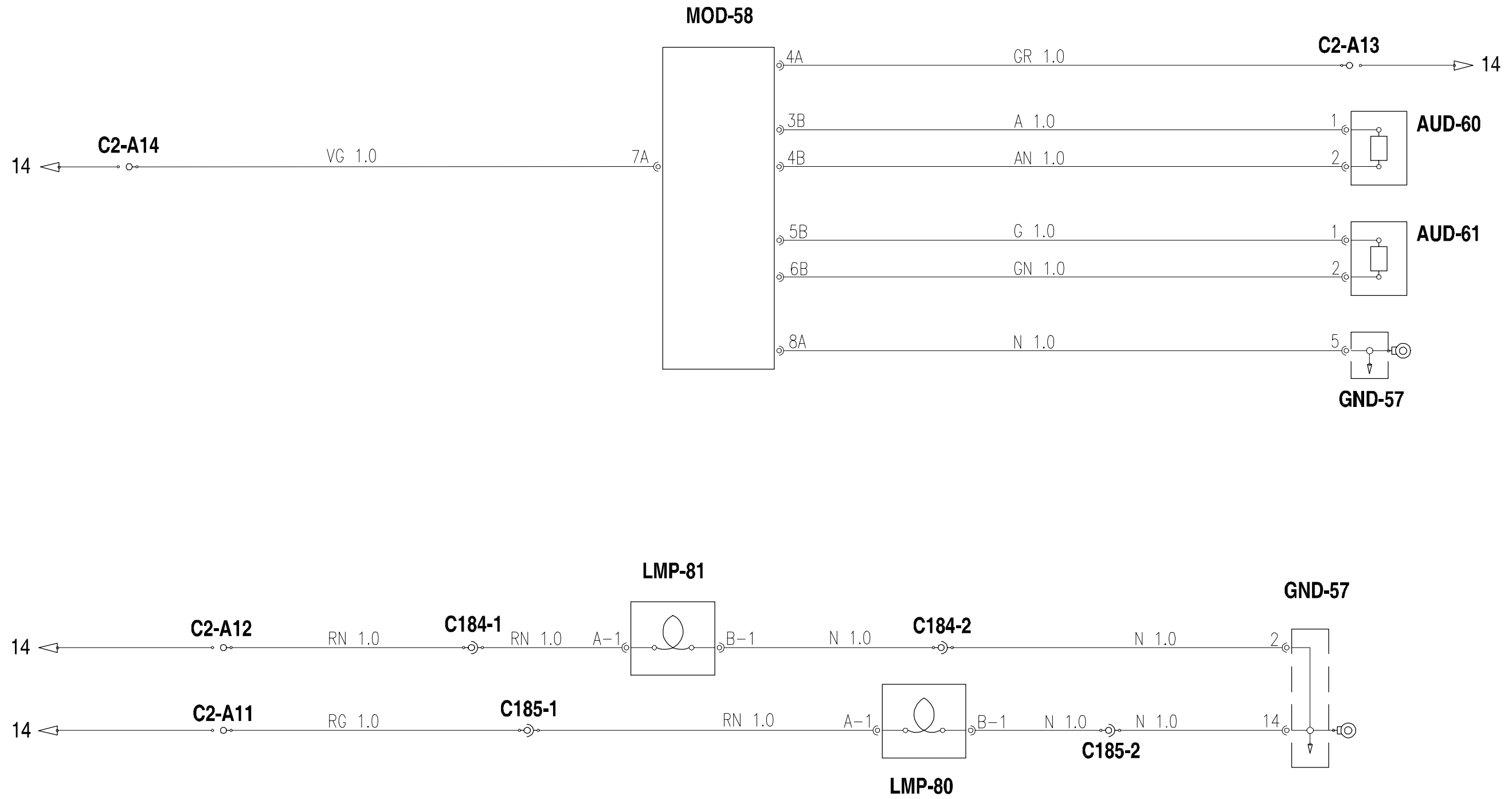


COMPONENT LOCATIONS - DIAGRAMS 14 THROUGH 17

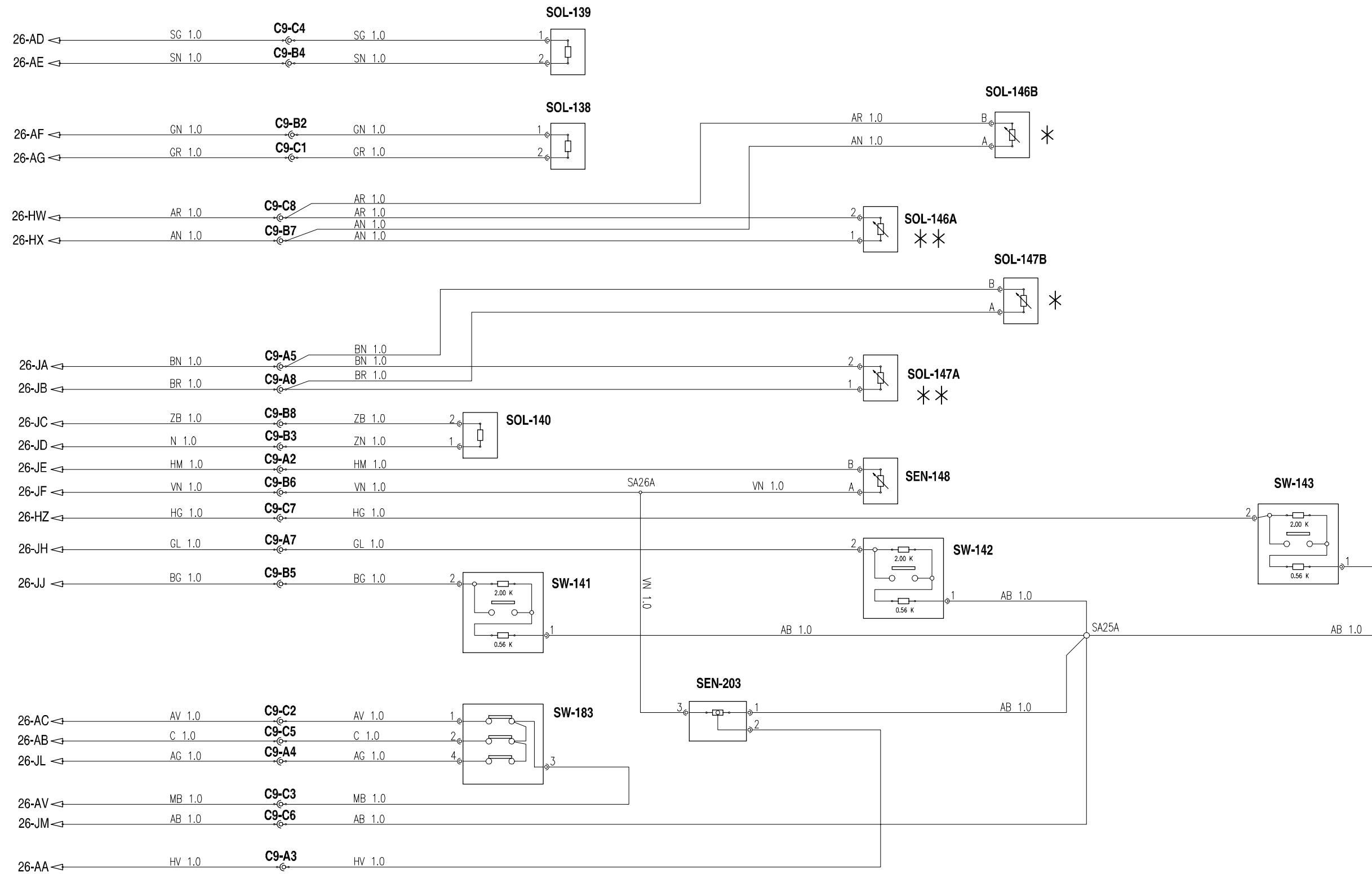


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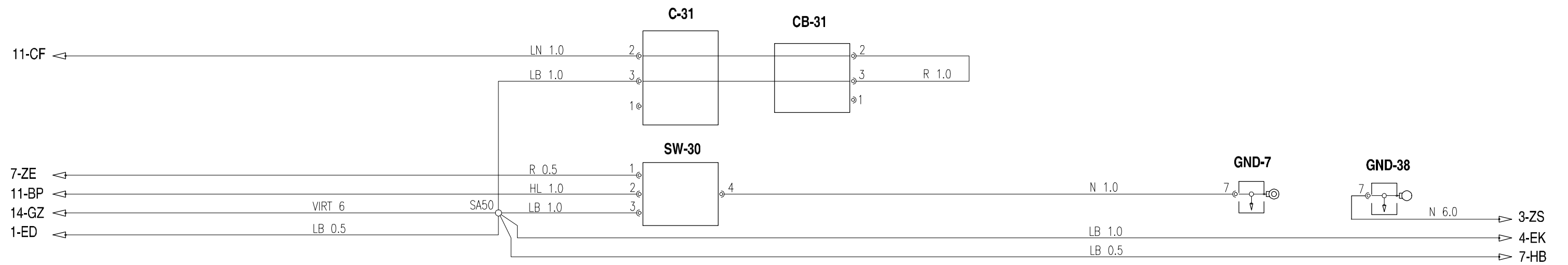
SUPPLEMENTARY DIRECTION INDICATOR LIGHTS AND RADIO CIRCUIT - DIAGRAM 20



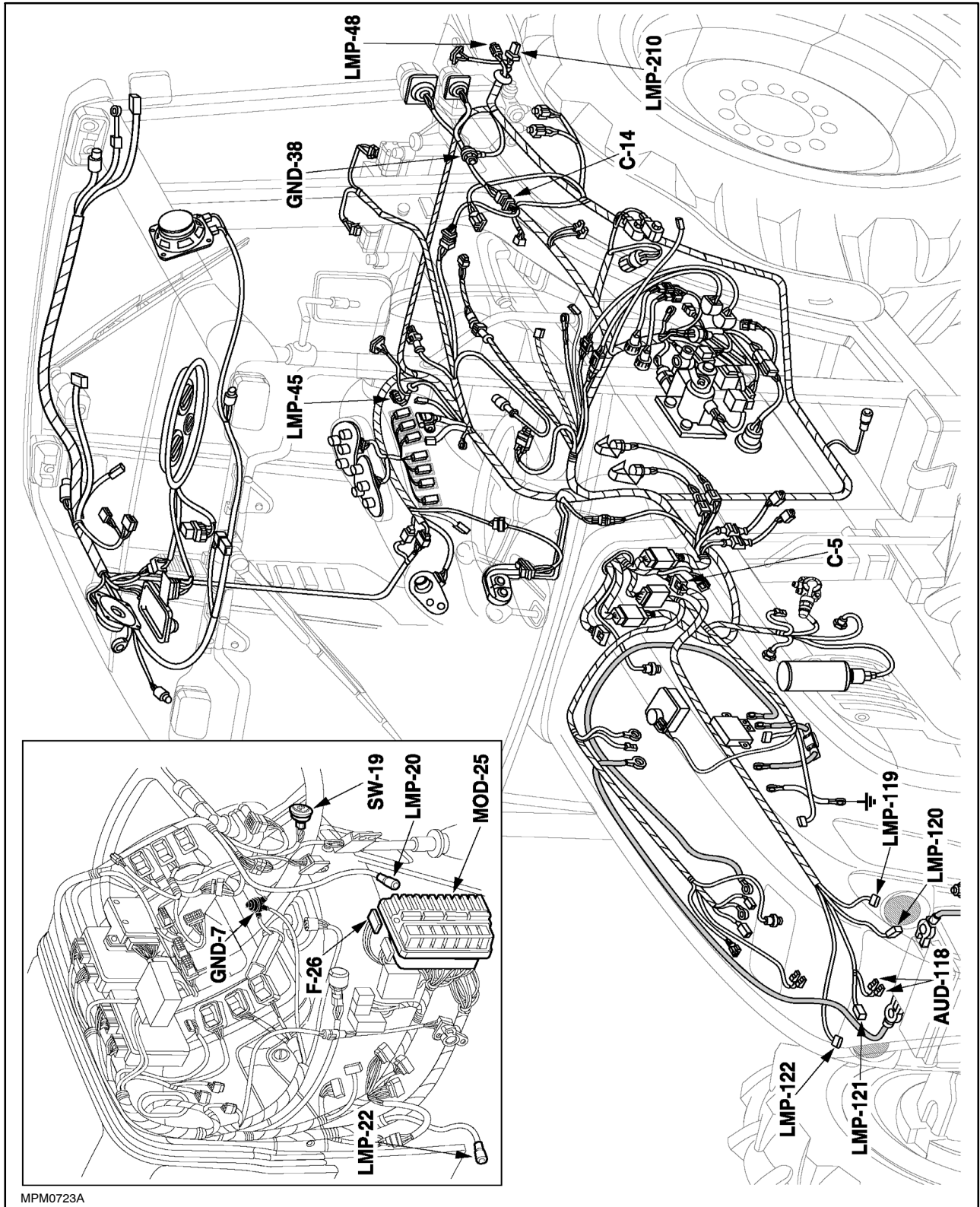
POWER SHUTTLE CIRCUIT (transmission side) - DIAGRAM 27



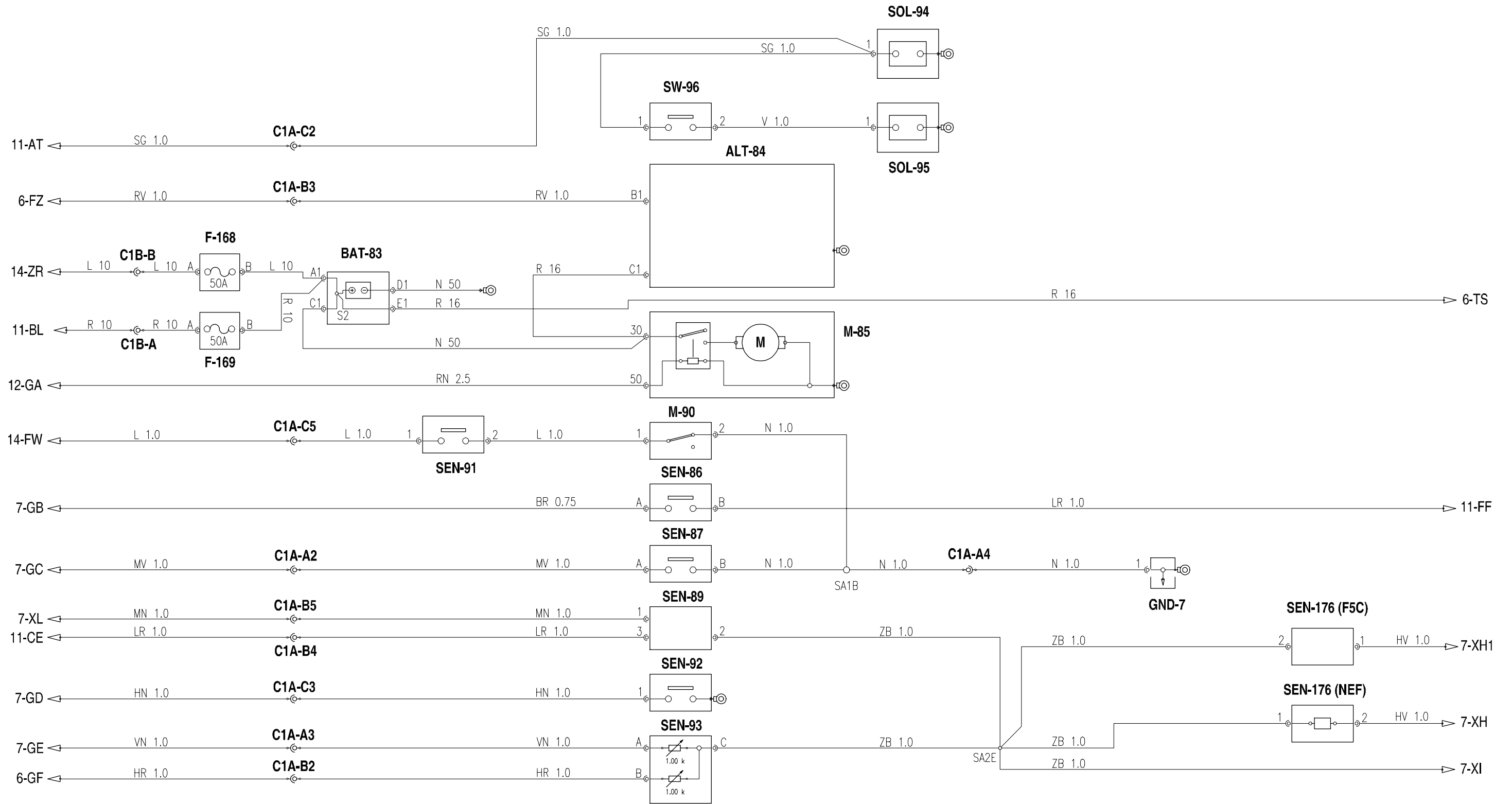
BATTERY CUT-OUT CIRCUIT - DIAGRAM 2



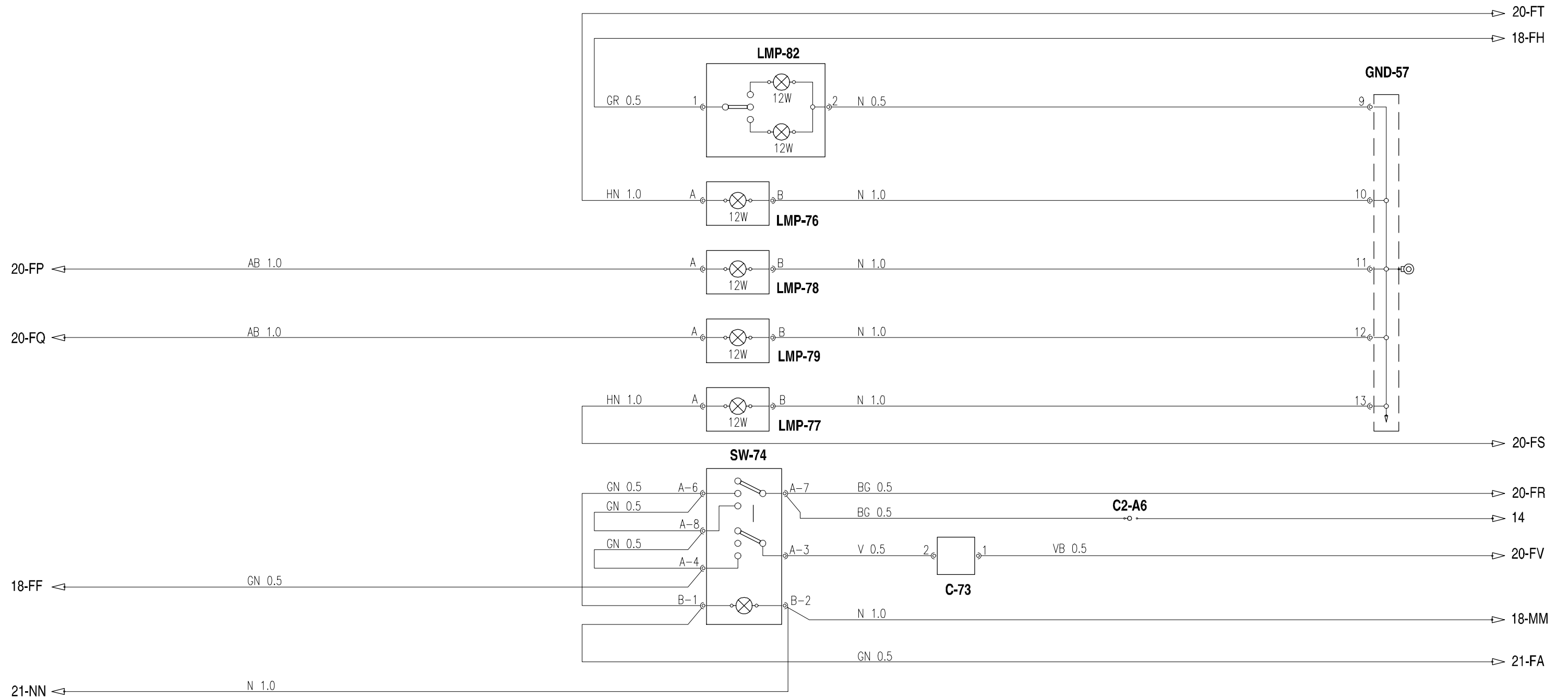
COMPONENT LOCATIONS - DIAGRAMS 9 THROUGH 12



ENGINE, SENSORS AND TRANSMITTERS CIRCUIT - DIAGRAM 15

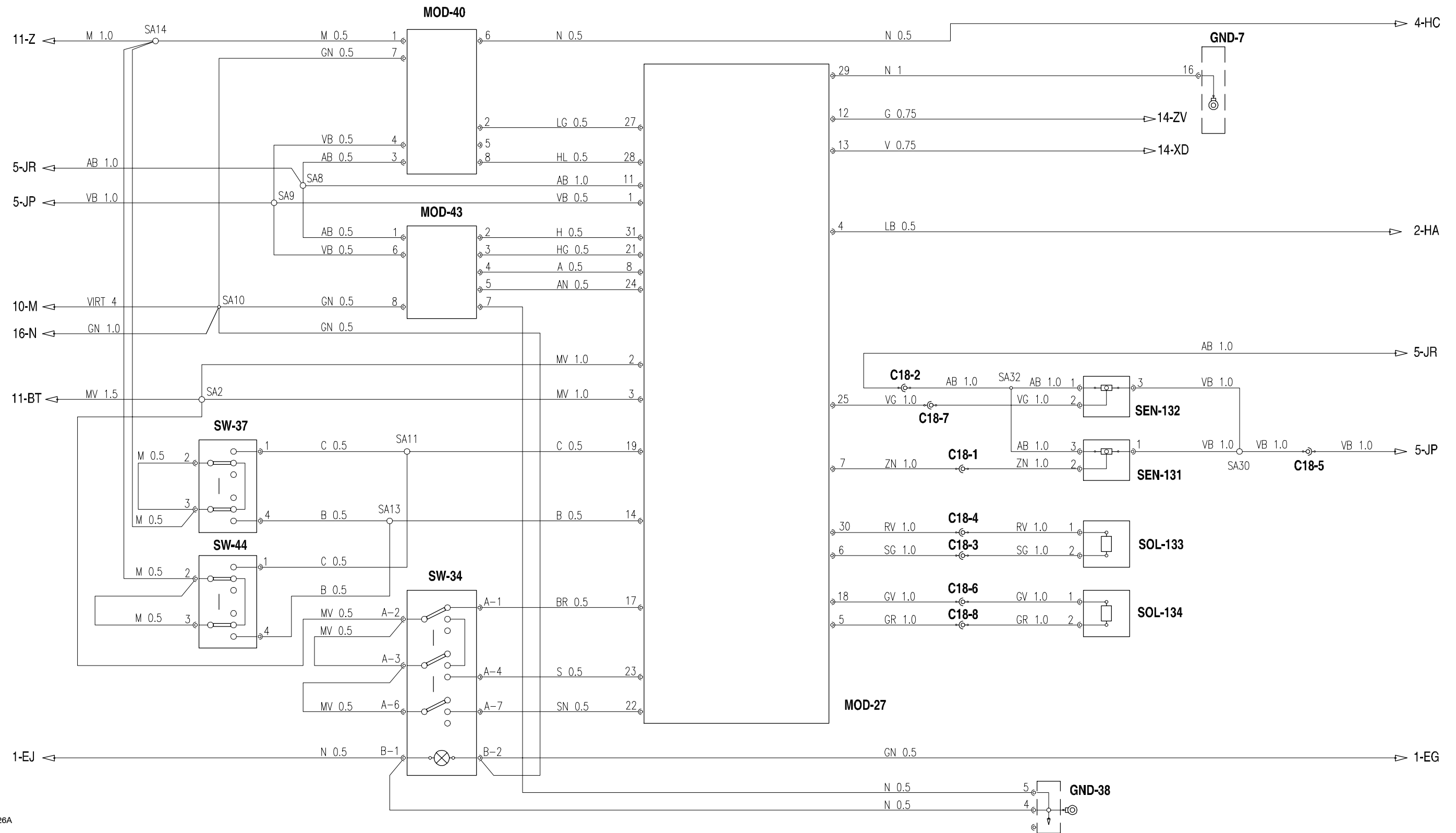


WORK LIGHTS CIRCUIT - DIAGRAM 22

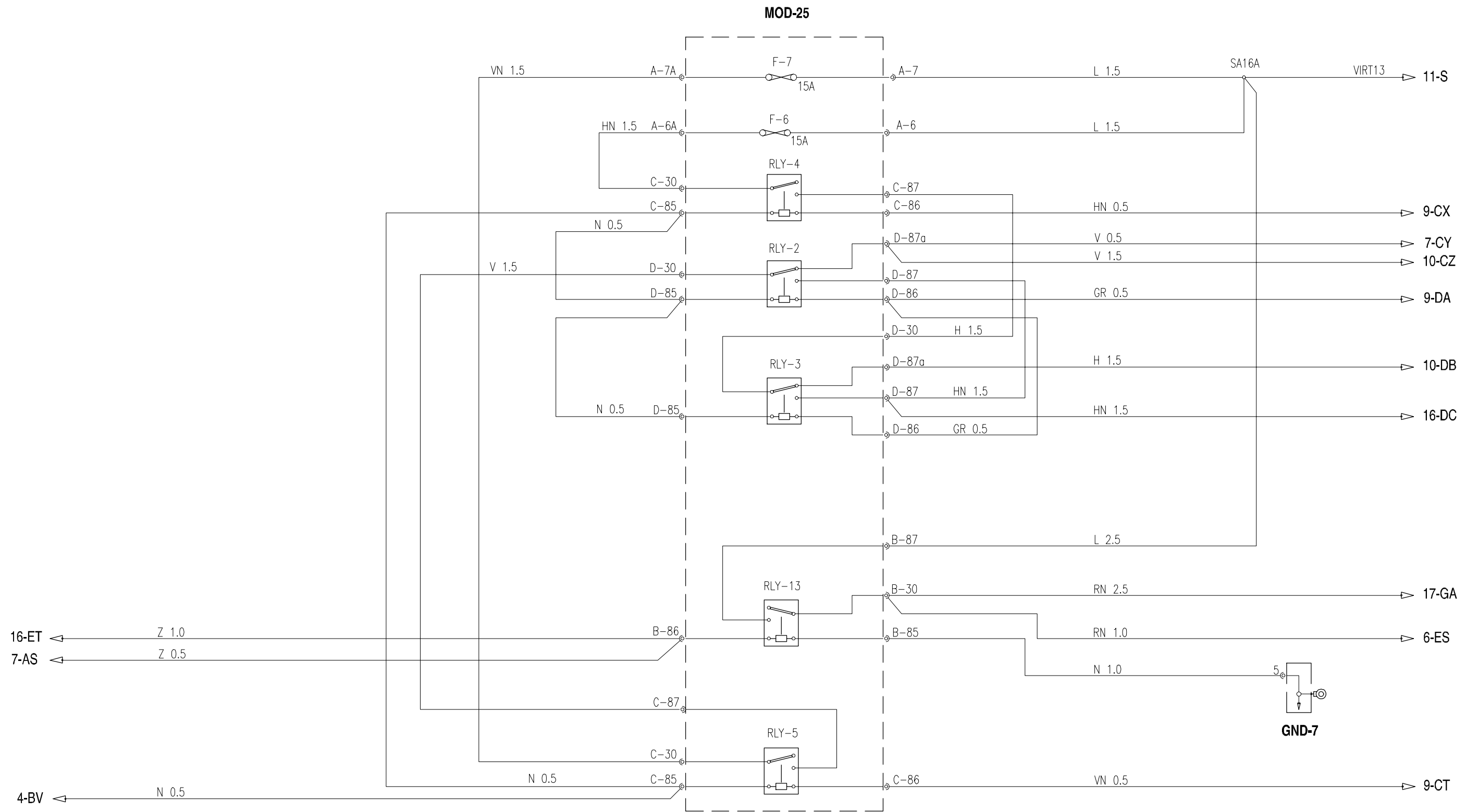


SW-35	1	4WD control switch
SW-36	4	Differential lock switch
SW-37	5	LH rear external electronic lift up/down switch
GND-38	3, 5, 10, 13	Rear ground
SW-39	4	Parking brake switch
MOD-40	5	Working depth adjustment and rear electronic lift control panel
C-41	3	Seat connection
M-42	3	Front and rear window washer pumps
MOD-43	5	Rear electronic lift control panel
SW-44	5	RH rear external electronic lift up/down switch
LMP-45	10	RH tail light
C-46	3	8A two-pin socket
C-47	3	40 A four-pole power socket (North America)
LMP-48	10	LH tail light
C-49	3	25A two-pin socket
SW-52	22	Front windscreen washer switch
SW-53	22	Windscreen wiper switch
M-54	22	Wiper motor
SW-55	22	Rear window washer/wiper switch
M-56	22	Rear wiper motor
GND-57	18, 19, 20, 21, 22, 23	Cab ground
MOD-58	20	Radio
AUD-60	20	RH speaker
AUD-61	20	LH speaker
C-62	18	Fan unit connection
SW-63	19	Rotating beacon control switch
MOD-64	1	Permanent 4WD control unit
RES-66	18	Fan speed resistor unit
SW-67	18	Ventilation and air-conditioning system electric fan switch
M-68	18	Ventilation and air-conditioning system electric fan
LMP-69	18	Fan control unit lamp
RLY-70	18	Conditioner relay
SEN-71	18	Air-conditioner electronic thermostat
SW-72	18	Air conditioner control switch
C-73	23	Front work lights connection
SW-74	23	Work lights switch
MOD-75	21	Fuse box and cab relays

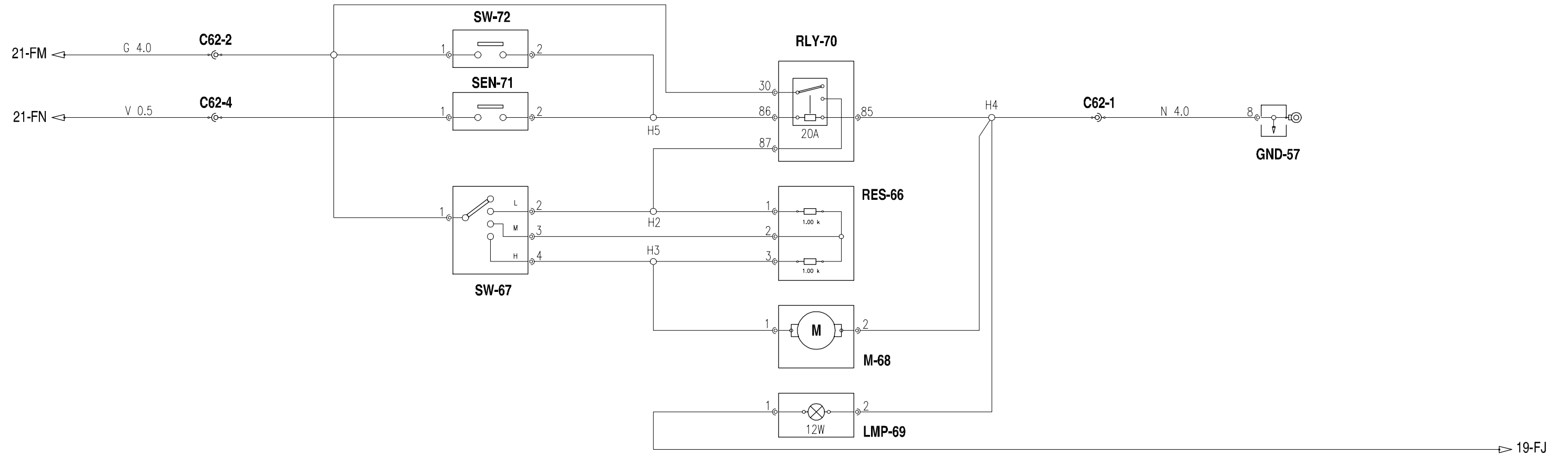
FRONT AND REAR ELECTRONIC LIFT CIRCUIT - DIAGRAM 5



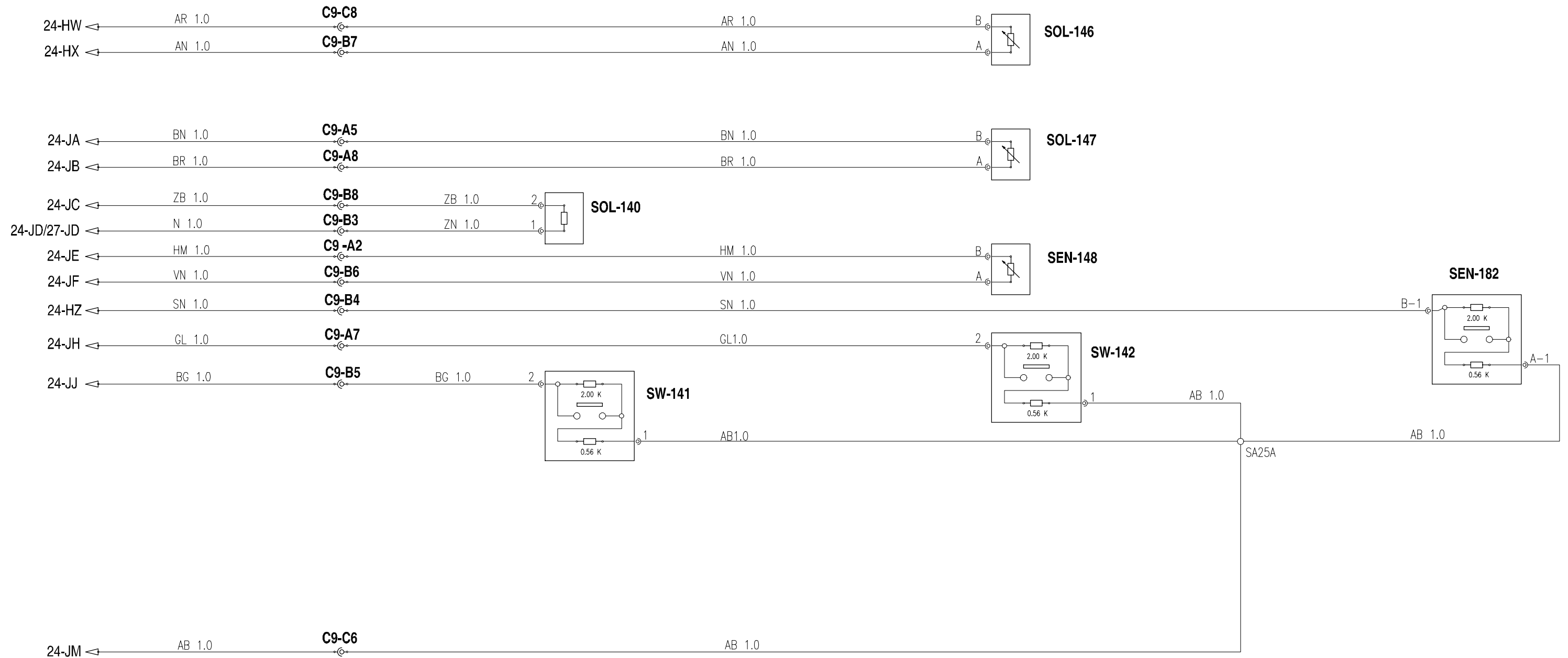
POWER SUPPLIES 2 CIRCUIT - DIAGRAM 12



CAB VENTILATION AND AIR-CONDITIONING CIRCUIT - DIAGRAM 18



POWER SHUTTLE CIRCUIT (transmission side) - DIAGRAM 25



COMPONENT LIST - NUMERIC ORDER (continued)

MOD-156	Grid heater electronic module
RLY-157	Grid heater relay (coil)
RLY-158	Grid heater relay (contact)
RES-159	Grid heater
F-160	125A maxi-fuse
SW-161	"Up/Down" control button
SW-162	"Enter" control button
C-166	Brake lights signal test connection
C-167	Connection for CAN line (4 PIN)
F-169	50A mega-fuse
C-175	Four-wheel drive system connection (4 PIN)
SEN-176	Engine rpm sensor
MOD-177	Digital instrument
LMP-178	Work light
C-179	Rear lights connection (2 PIN)
C-180	Rear lights connection (6 PIN)
GND-181	Trailer brake circuit ground
SEN-182	Transmission oil pressure sensor
SW-183	Dual Command (2 Speed Power Shift) and Dump Clutch buttons
SEN-203	Shuttle position sensor
MOD-204	Four-wheel drive control unit
SW-205	Front lift UP external control switch
SW-206	Front lift DOWN external control switch
SEN-208	Front PTO sensor
LMP-212	Number plate light
LMP-213	RH two-faced headlight
LMP-214	LH two-faced headlight
GND-215	Power sockets ground

ELECTRICAL CIRCUIT COMPONENTS (functional order)

COMPONENT DESCRIPTION

ALTERNATOR

ALT-84 Alternator

AUDIO DEVICES

AUD-118 Horn

BATTERY

BAT-83 Battery

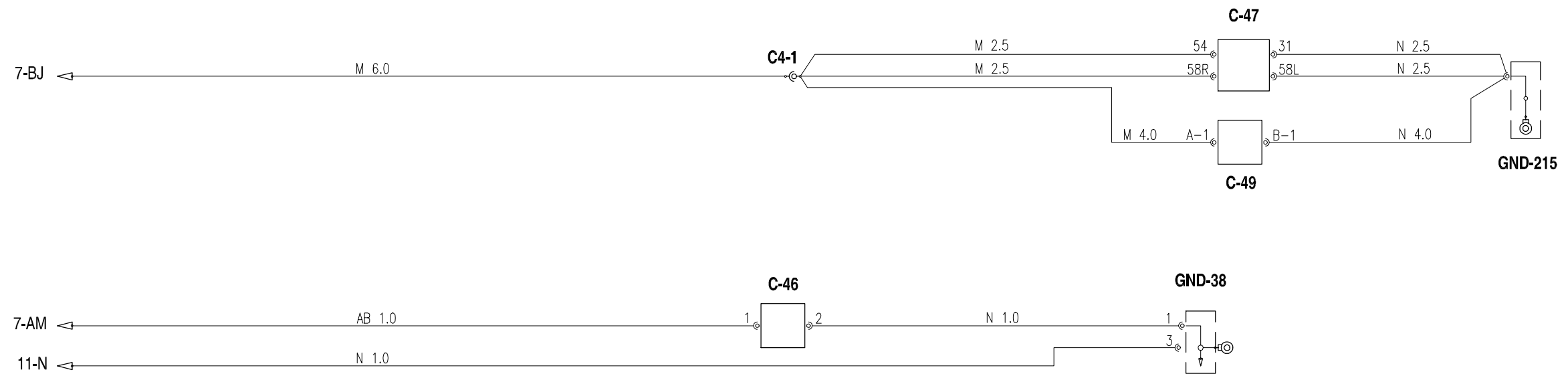
CONNECTIONS

C-1 Front side connection - engine (24 PIN)
C-3 Trailer brake circuit intermediate connection (4 PIN)
C-4 25A / 40A socket connection
C-5 Front lights connection
C-6 Transmission system connection (24 PIN)
C-8 Trailer brake circuit main connection (4 PIN)
C-9 Power-Shuttle transmission system connection (24 PIN)
C-13 Front PTO and lift system connection (13 PIN)
C-14 Seven-pin socket connection
C-14A ISO seven-pin socket
C-14B North American seven-pin socket
C-15 Gearbox neutral connection
C-16 Electronic thermostarter connection (6 PIN)
C-21 Power-Shuttle system connection (6 PIN)
C-24 Digital instrument connection
C-28 Diagnostics connection
C-41 Seat connection
C-166 Brake lights signal test connection
C-167 Connection for CAN line (4 PIN)
C-175 Four-wheel drive system connection (4 PIN)
C-179 Rear lights connection (2 PIN)
C-180 Rear lights connection (6 PIN)

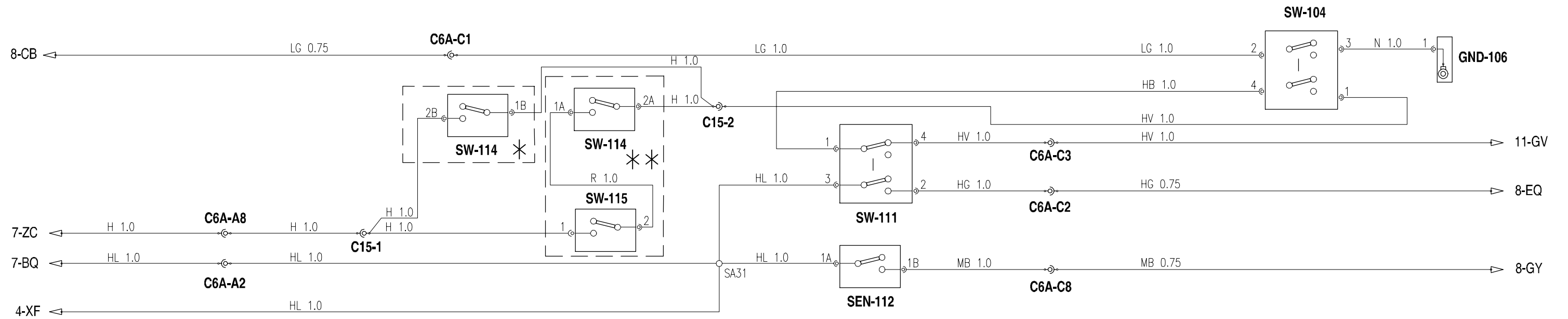
FUSES

F-26 30A maxi-fuse (40A for North America)
F-160 125A Maxi-fuse
F-169 50A mega-fuse

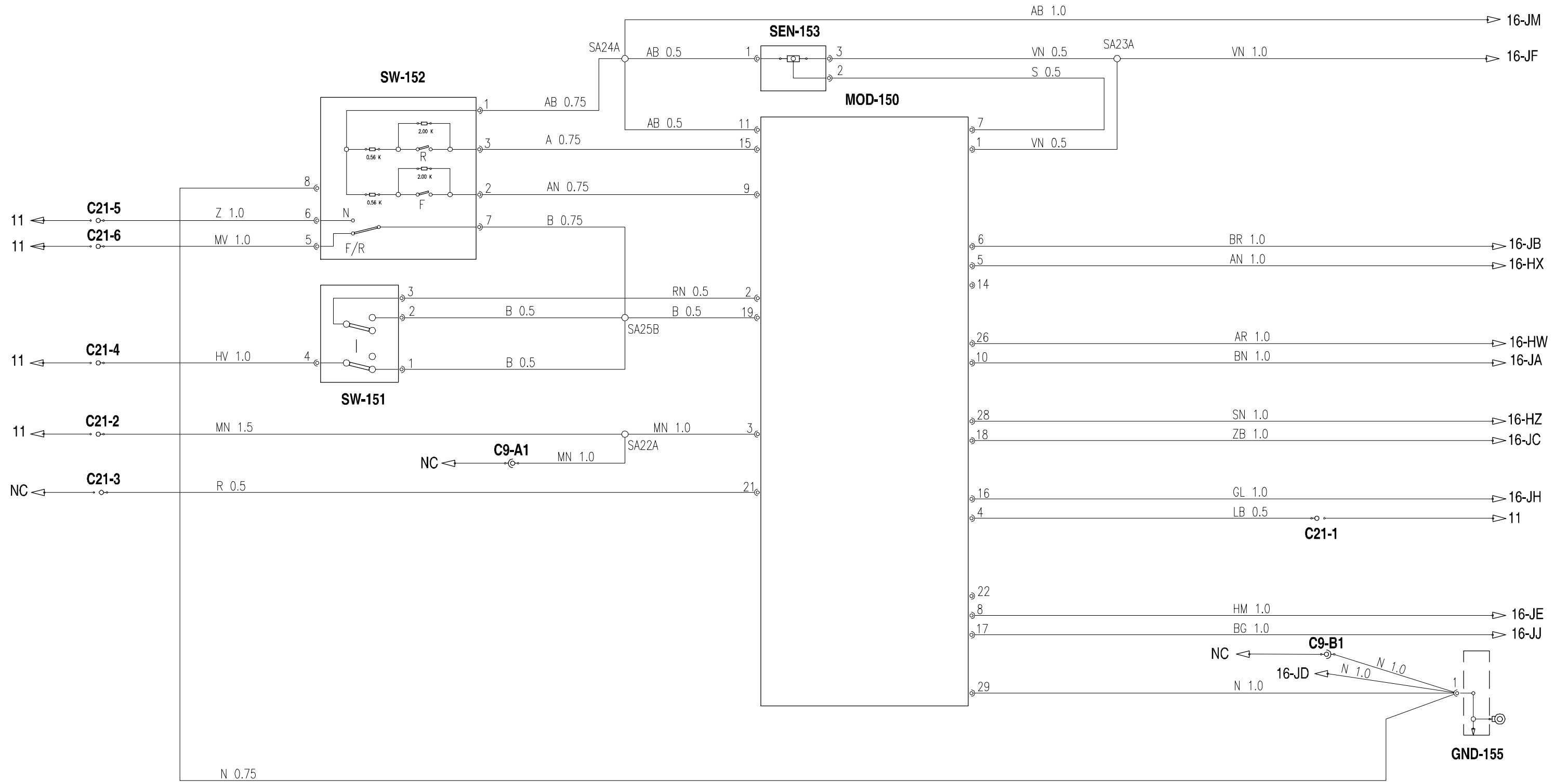
POWER SOCKET CIRCUIT - DIAGRAM 3



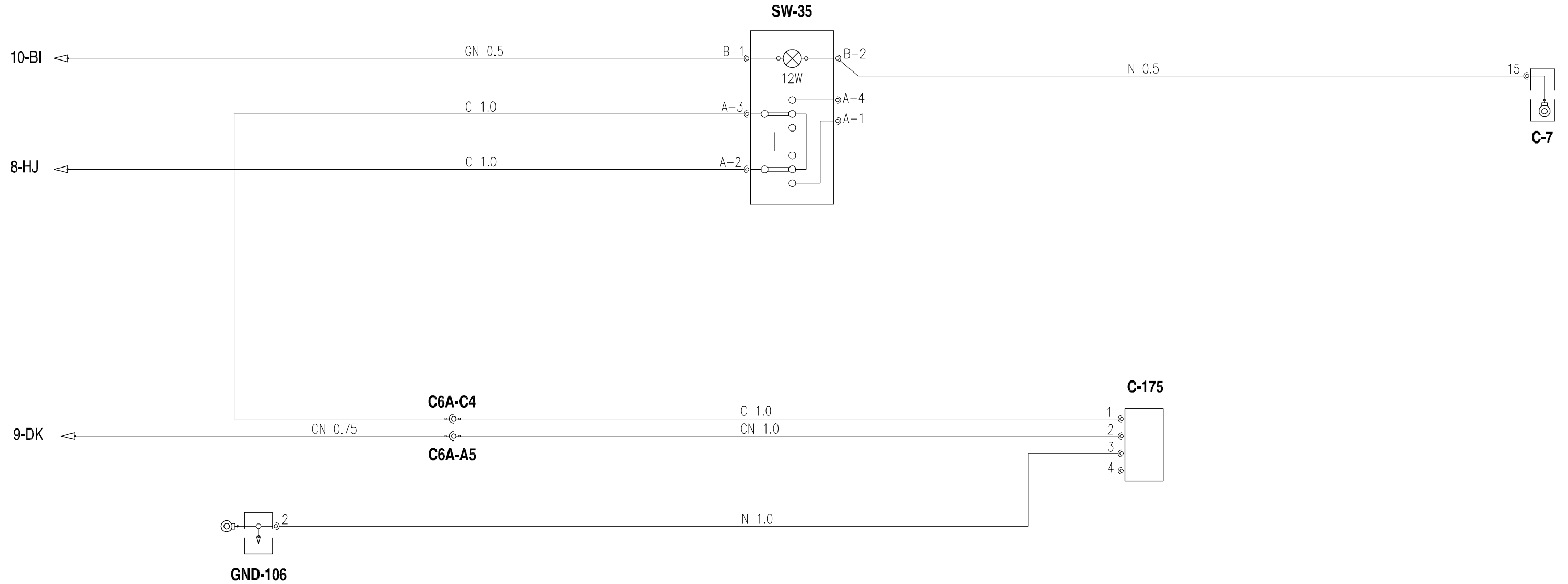
POWER TAKE-OFF AND SAFETY DEVICE CIRCUIT - DIAGRAM 9



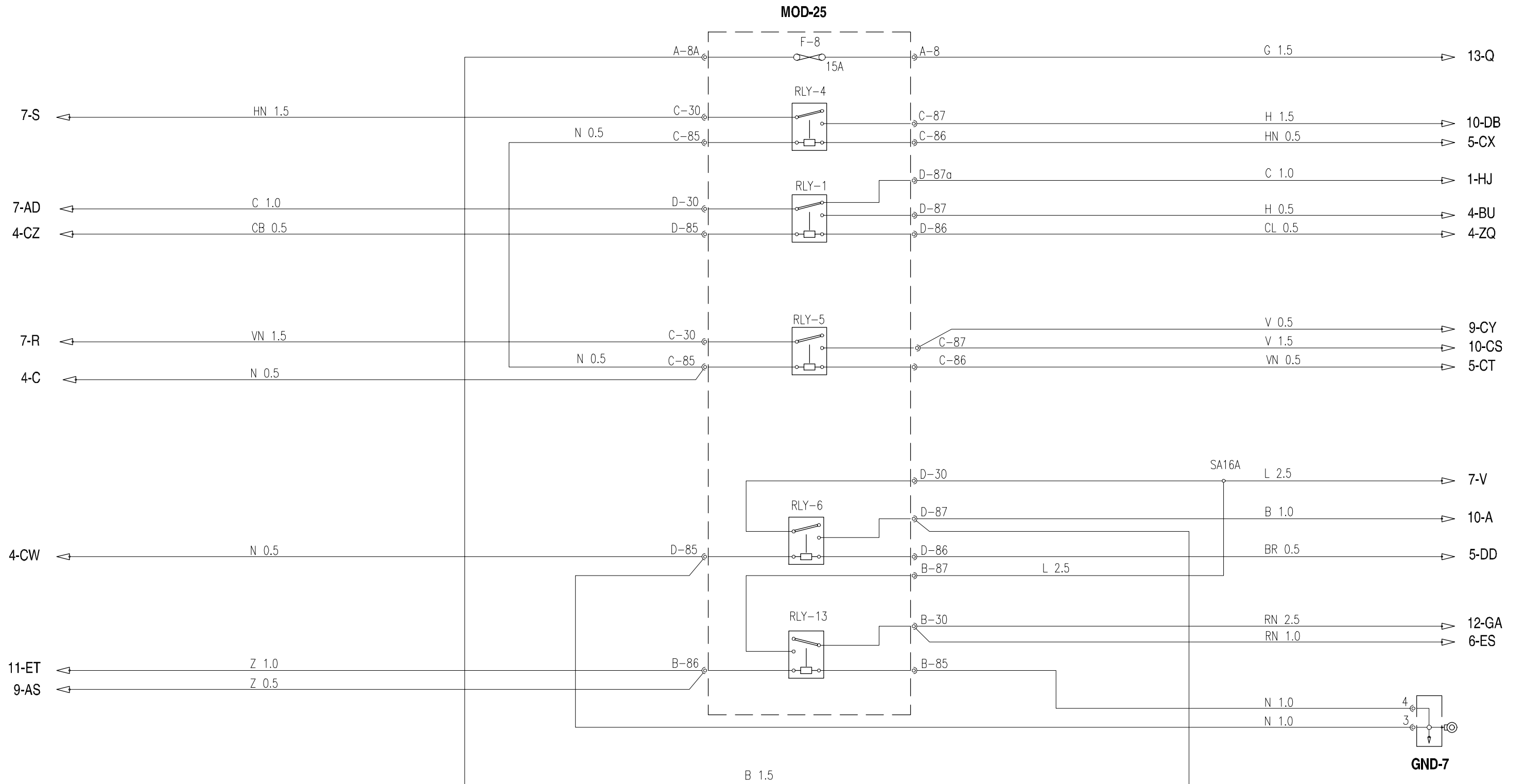
POWER SHUTTLE CIRCUIT 8+8 / 16+16 (dashboard side) - DIAGRAM 15



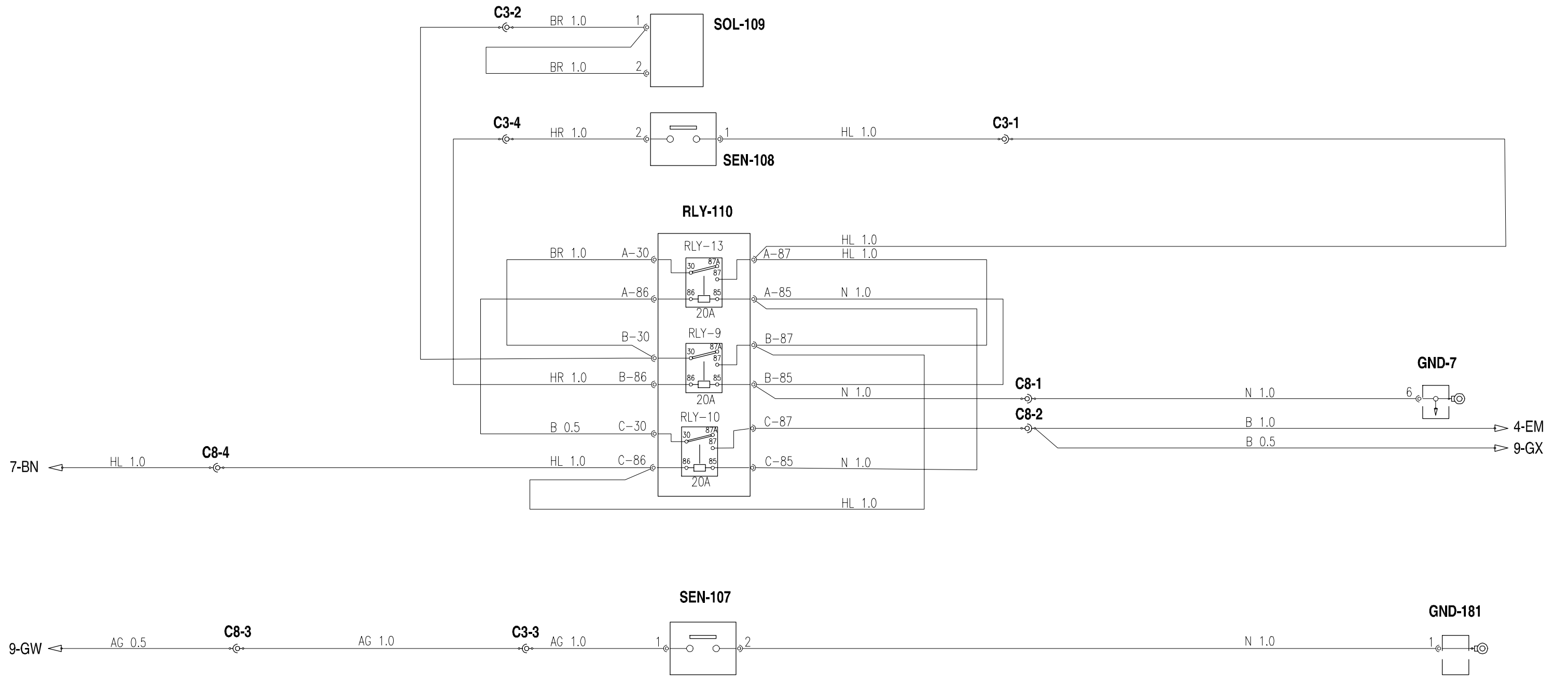
FOUR-WHEEL DRIVE CIRCUIT - DIAGRAM 1



POWER SUPPLIES 2 CIRCUIT - DIAGRAM 8



TRAILER BRAKE CIRCUIT - DIAGRAM 14

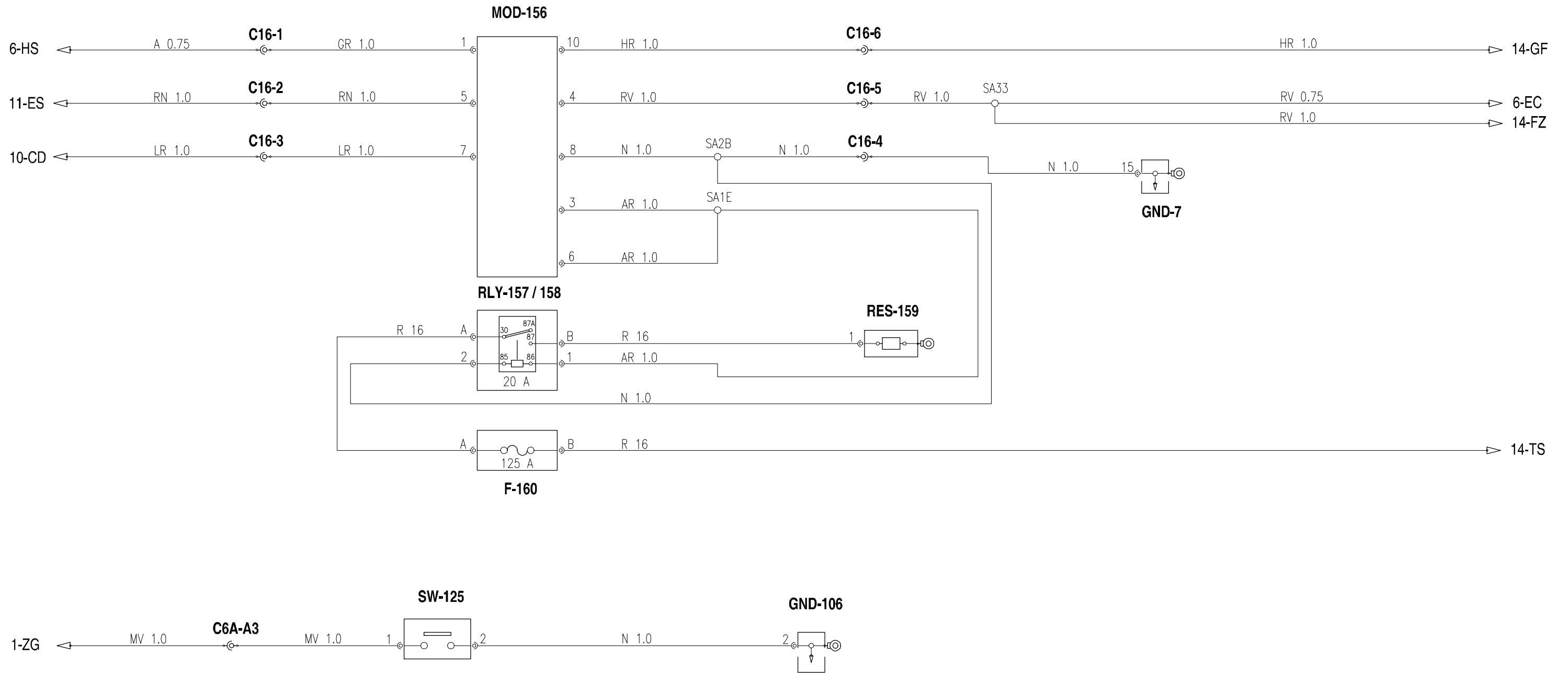


**VERSION 3 - PERMANENT FOUR-WHEEL DRIVE, ELECTROHYDRAULIC DIFFERENTIAL
LOCK, REAR MECHANICAL LIFT**

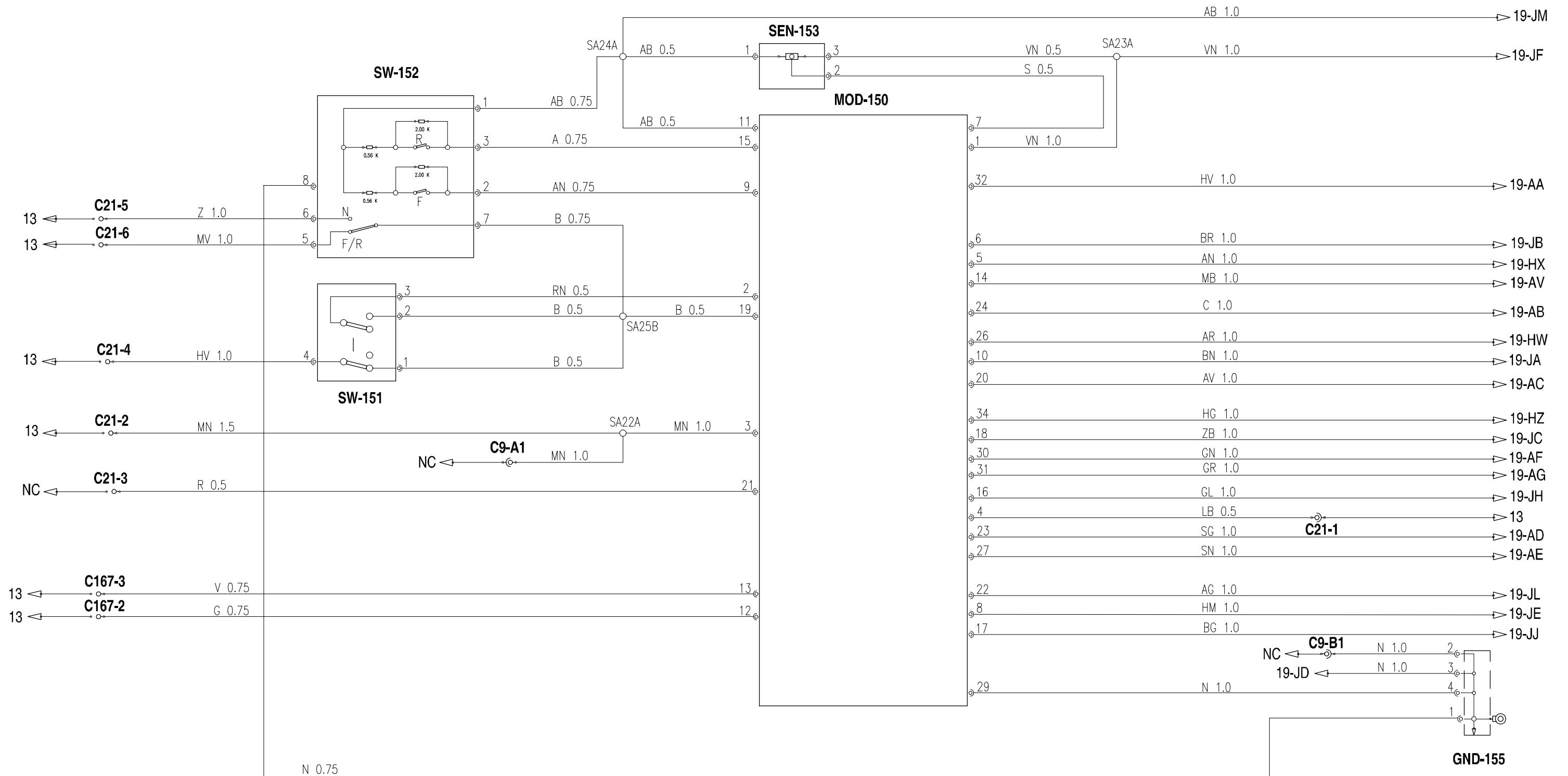
CIRCUIT INDEX

Description	Wiring diagram circuits	Page
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Circuit 2	Power socket circuit	144
Circuit 3	Brakes, brake lights, differential lock circuit	146
Circuit 4	Direction indicator and hazard lights circuit (control switches and flasher)	148
	Component Locations - Diagrams 5 through 8	151
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Circuit 6	Instrument and sensor circuit	154
Circuit 7	Power take-off and safety device circuit	156
Circuit 8	Seven-pin socket and number plate light circuit	158
	Component Locations - Diagrams 9 through 13	161
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Circuit 10	Power supplies 1 circuit	164
Circuit 11	Power supplies 2 circuit	166
Circuit 12	Trailer brake circuit	168
Circuit 13	Intermediate connections circuit	170
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	Component Locations - Diagrams 16 through 20	179
Circuit 16	Power Shuttle 8+8 / 16+16 circuit (dashboard side)	180
Circuit 17	Power Shuttle circuit (transmission side)	182
Circuit 18	Power Shuttle 32+16 / 44+16 circuit (dashboard side)	184
Circuit 19	Power Shuttle circuit (transmission side)	186
Circuit 20	Front PTO circuit	188

GRID-HEATER CIRCUIT - DIAGRAM 5

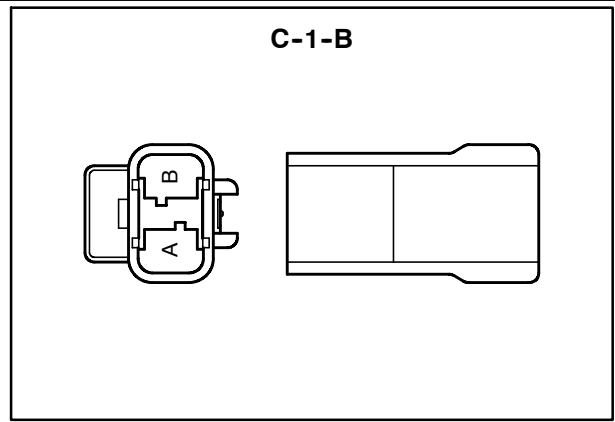


POWER SHUTTLE CIRCUIT 32+16 / 44+16 (dashboard side) - DIAGRAM 18



Pin	Col.	Sect.	Pin	Col.	Sect.
A	R	10	B	L	10

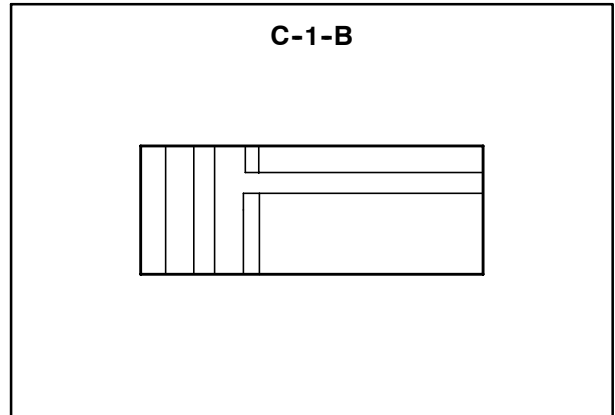
For model with cab.
MAIN CABLE SIDE



8

Pin	Col.	Sect.	Pin	Col.	Sect.
A	R	10	B	L	10

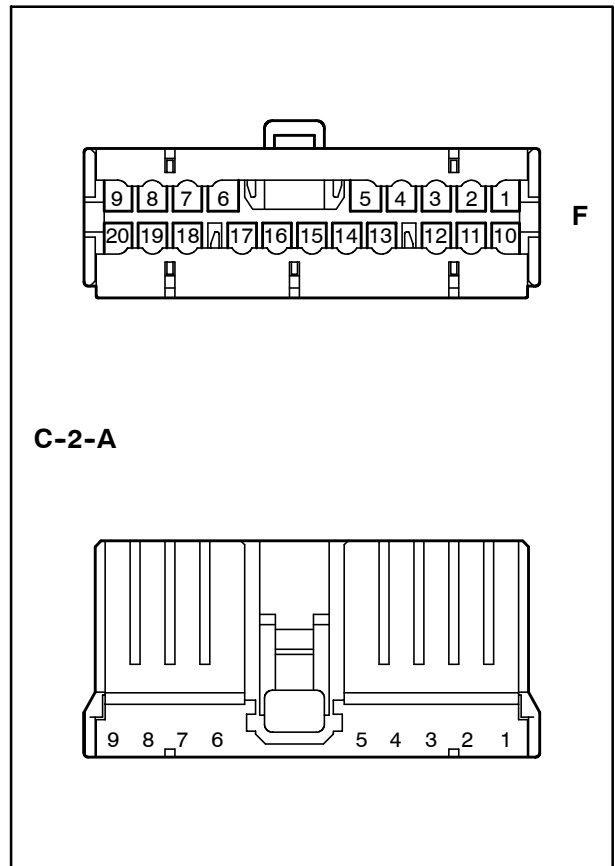
For model with cab.
POWER CABLE SIDE



9

Pin	Col.	Sect.	Pin	Col.	Sect.
1	HN	1.5	11	H	1.0
2	VN	1.5	12	BN	1.0
3	HB	0.5	13	LB	1.0
4	G	1.0	14	VG	1.0
5	L	1.0	15	-	-
6	BG	0.5	16	-	-
7	CL	1.0	17	-	-
8	BL	1.0	18	-	-
9	AB	1.0	19	-	-
10	GN	1.0	20	-	-

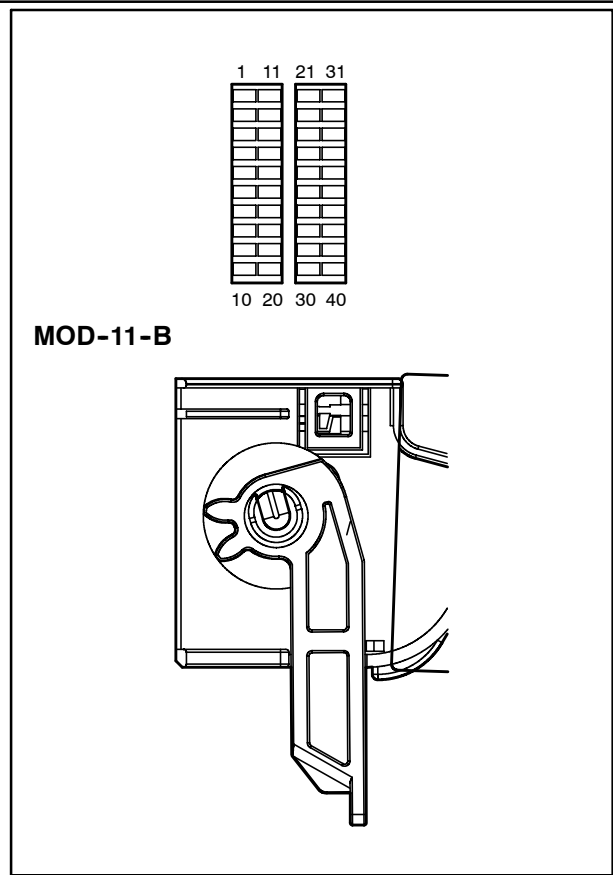
For model with cab, version 1, 2 and 3.
MAIN CABLE SIDE



10

Pin	Col.	Sect.	Pin	Col.	Sect.
1	-	-	21	-	-
2	-	-	22	-	-
3	BL	0.5	23	-	-
4	-	-	24	-	-
5	-	-	25	-	-
6	-	-	26	-	-
7	-	-	27	-	-
8	-	-	28	-	-
9	-	-	29	-	-
10	-	-	30	-	-
11	RV	0.5	31	-	-
12	G	0.75	32	-	-
13	V	0.75	33	-	-
14	SN	0.75	34	-	-
15	BN	0.75	35	-	-
16	MN	0.75	36	-	-
17	LN	0.75	37	-	-
18	BC	0.75	38	-	-
19	HB	0.75	39	-	-
20	-	-	40	-	-

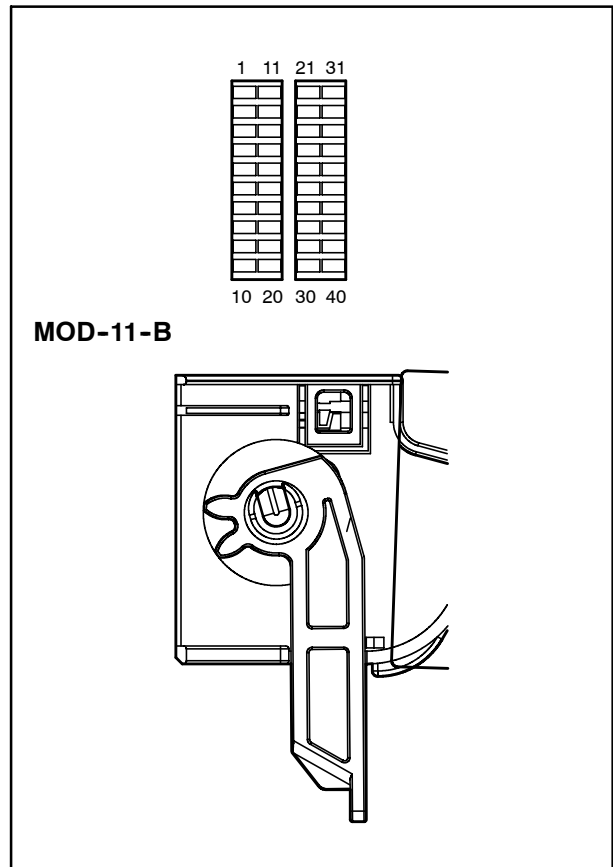
For model with cab, version 3.



53

Pin	Col.	Sect.	Pin	Col.	Sect.
1	-	-	21	-	-
2	-	-	22	-	-
3	BL	0.5	23	-	-
4	-	-	24	-	-
5	-	-	25	-	-
6	-	-	26	-	-
7	-	-	27	-	-
8	-	-	28	-	-
9	-	-	29	-	-
10	-	-	30	-	-
11	RV	0.5	31	-	-
12	G	0.75	32	-	-
13	V	0.75	33	-	-
14	SN	0.75	34	-	-
15	BN	0.75	35	-	-
16	MN	0.75	36	-	-
17	LN	0.75	37	-	-
18	BC	0.75	38	-	-
19	-	-	39	-	-
20	-	-	40	-	-

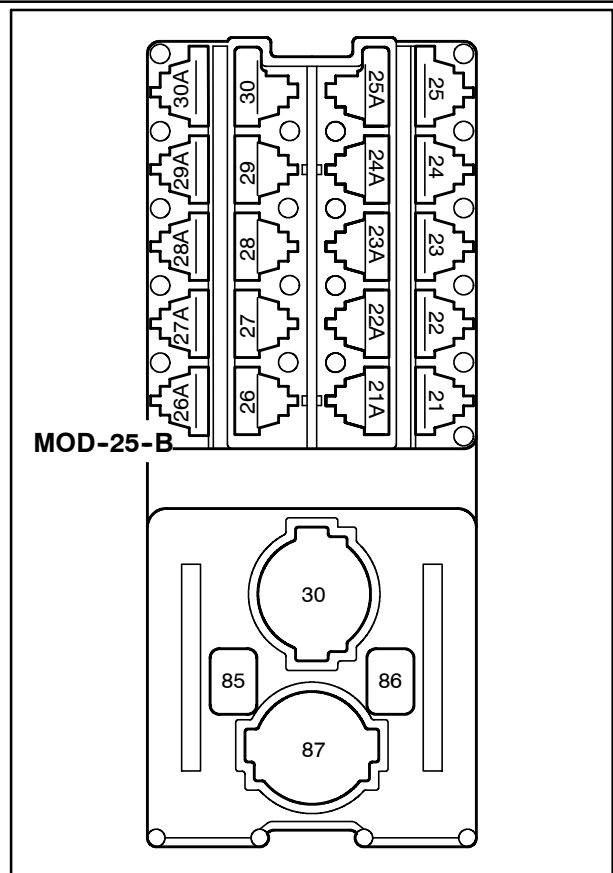
For model with cab, version 4 and 5.



54

Pin	Col.	Sect.	Pin	Col.	Sect.
21	-	-	27	-	-
21A	-	-	27A	-	-
22	-	-	28A	-	-
22A	-	-	28	-	-
23	-	-	29	-	-
23A	-	-	29A	-	-
24	-	-	30	M	1.0
24A	-	-	30A	VG	1.0
25	L	1.0	R_85	N	1.0
25A	LN	1.0	R_30	RN	2.5,1.0
26	-	-	R_87	L	2.5
26A	-	-	R_86	Z	1.0,0.5

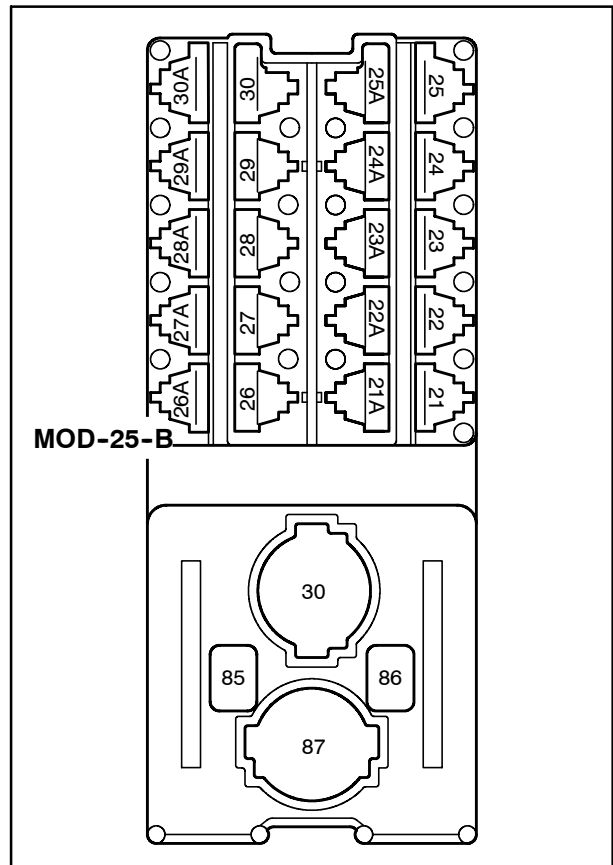
For model with cab, version 1.



99

Pin	Col.	Sect.	Pin	Col.	Sect.
21	-	-	27A	-	-
21A	-	-	28A	-	-
22	-	-	28	-	-
22A	-	-	29	-	-
23	-	-	29A	-	-
23A	-	-	30	VG	1.0
24	-	-	30A	M	1.0
24A	-	-	R_85	N	1.0
25	L	1.0	R_30	RN	2.5
25A	LN	1.0	-	RN	1.0
26	-	-	R_87	L	2.5
26A	-	-	R_86	Z	1.0
27	-	-	-	Z	0.5

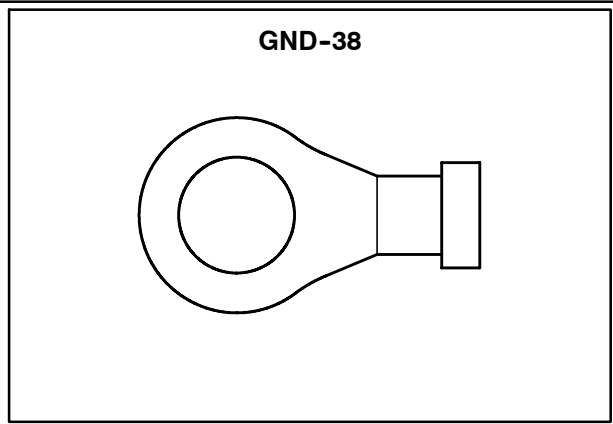
For model with cab, version 2.



100

Pin	Col.	Sect.	Pin	Col.	Sect.
1	N	0.5	4	N	1.0
2	N	1.0	5	N	1.0
3	N	1.0	-	-	-

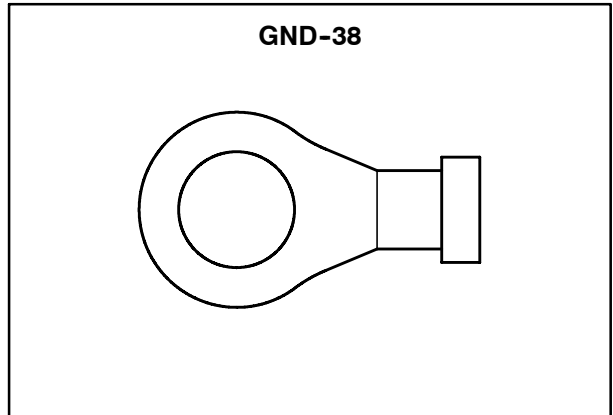
For model without cab, version 2.



144

Pin	Col.	Sect.	Pin	Col.	Sect.
1	N	1.0	4	N	1.0
2	N	0.5	5	N	1.0
3	N	1.0	6	N	1.0

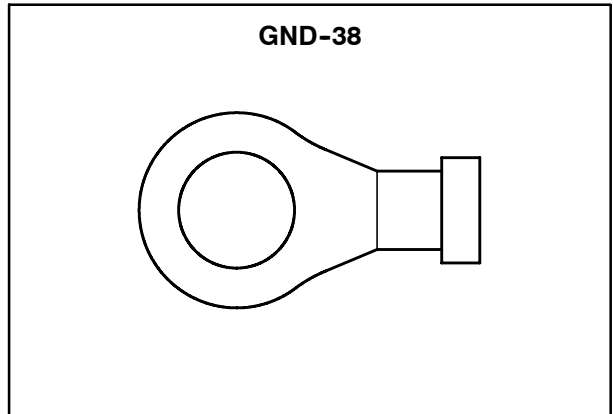
For model with cab, version 1 and 4.



145

Pin	Col.	Sect.	Pin	Col.	Sect.
1	N	1.0	4	N	1.0
2	N	1.0	5	N	1.0
3	N	0.5	6	N	1.0

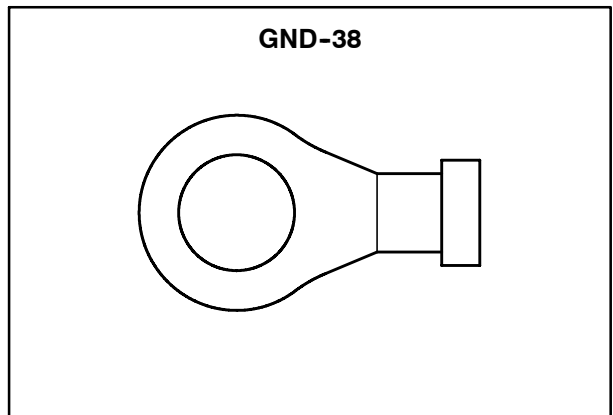
For model with cab, version 2.



146

Pin	Col.	Sect.	Pin	Col.	Sect.
1	N	1.0	5	N	1.0
2	N	1.0	6	N	0.5
3	N	0.5	7	N	0.5
4	N	1.0	8	N	1.0

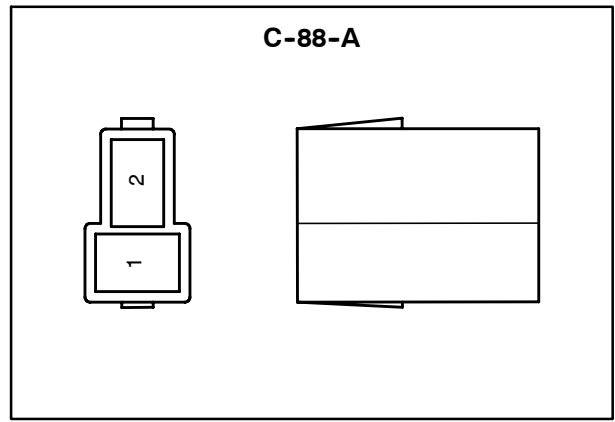
For model with cab, version 3.



147

Pin	Col.	Sect.	Pin	Col.	Sect.
1	N	1.0	2	GR	1.0

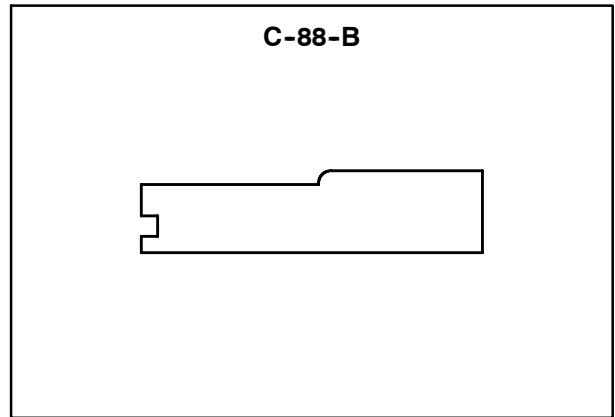
For model with cab.



206

Pin	Col.	Sect.	Pin	Col.	Sect.
1	GN	0.5	-	-	-
-	GN	1.0	-	-	-

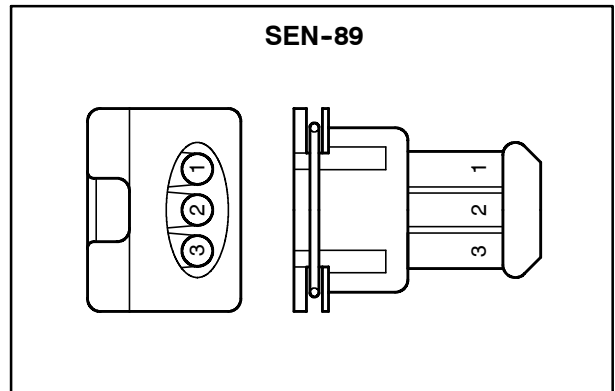
For model with cab.



207

Pin	Col.	Sect.	Pin	Col.	Sect.
1	MN	0.75	3	LR	1.0
2	ZB	1.0	-	-	-

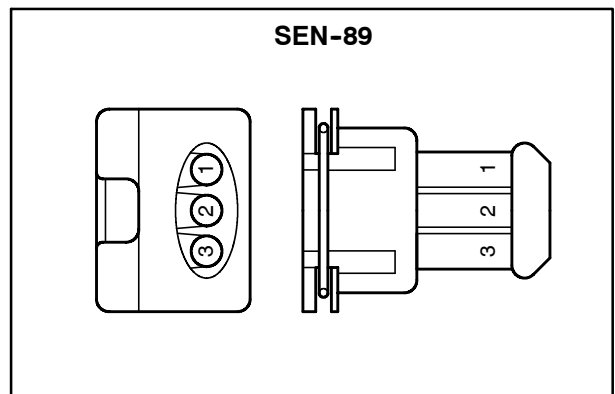
For model with cab.



208

Pin	Col.	Sect.	Pin	Col.	Sect.
1	MN	1.0	3	LR	1.0
2	ZB	1.0	-	-	-

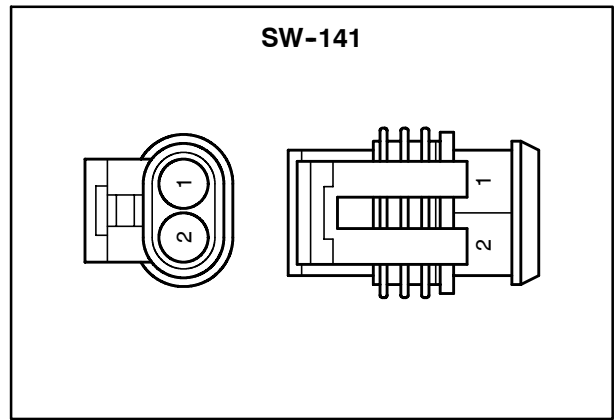
For model without cab.



209

Pin	Col.	Sect.	Pin	Col.	Sect.
1	AB	1.0	2	BG	1.0

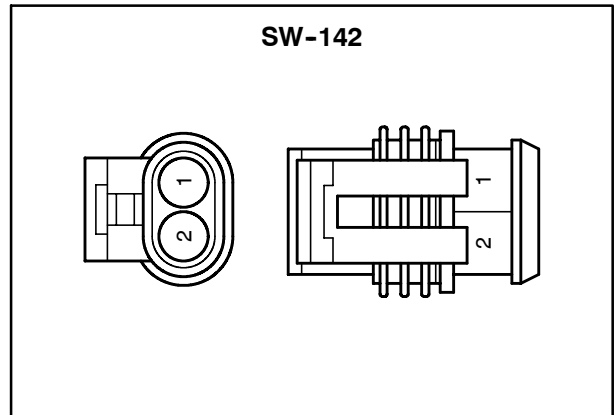
For Power-Shuttle version.



270

Pin	Col.	Sect.	Pin	Col.	Sect.
1	AB	1.0	2	GL	1.0

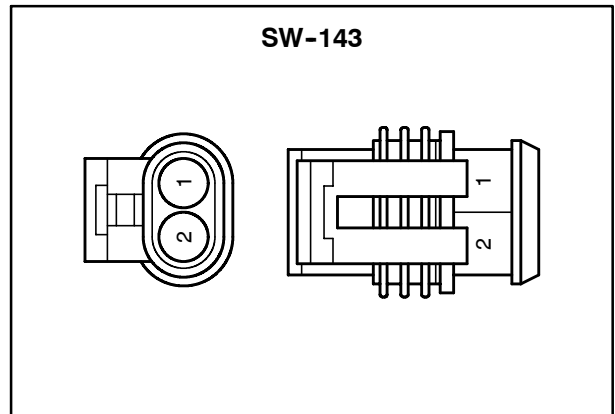
For Power-Shuttle version.



271

Pin	Col.	Sect.	Pin	Col.	Sect.
1	AB	1.0	2	HG	1.0

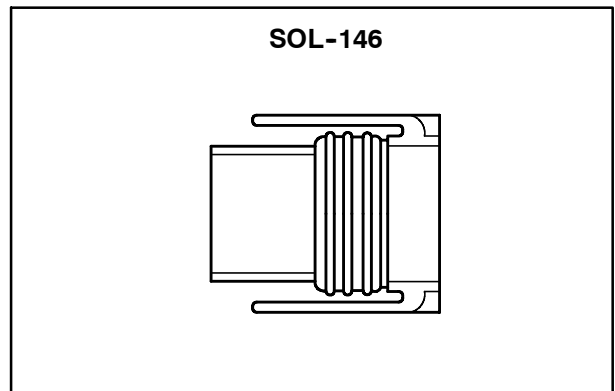
For version with Dual Command (2 Speed Power Shift) and version with Dual Command (2 Speed Power Shift) , paddy field version



272

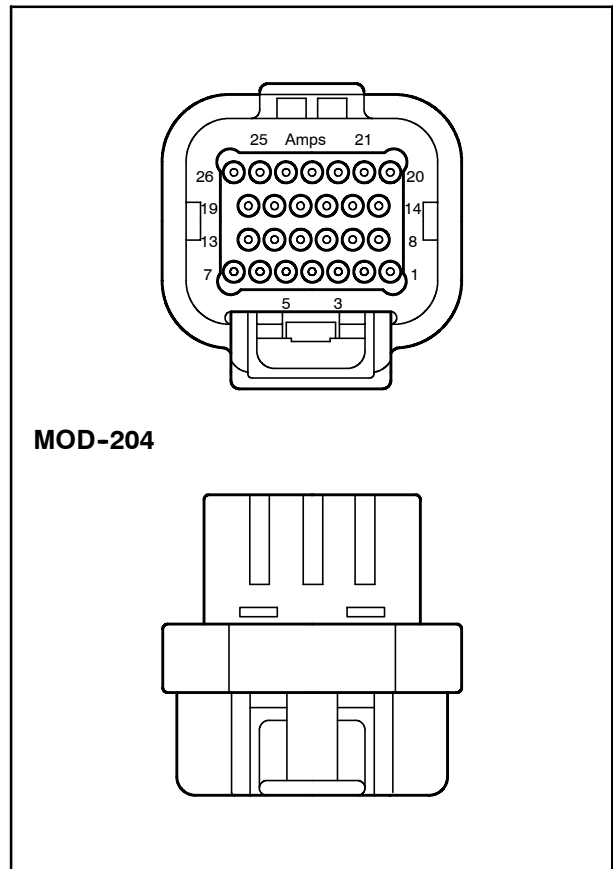
Pin	Col.	Sect.	Pin	Col.	Sect.
A	AN	1.0	B	AR	1.0

For Power-Shuttle version.



273

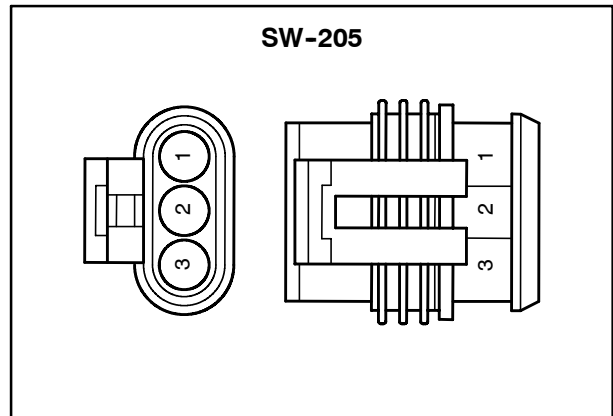
Pin	Col.	Sect.	Pin	Col.	Sect.
1	AB	0.5	14	-	-
2	A	1.0	15	-	-
3	AG	0.5	16	HV	0.5
4	BN	1.0	17	R	0.5
5	ZN	1.0	18	-	-
6	-	-	19	BR	1.0
7	AN	1.0	20	-	-
8	MV	1.0	21	AR	0.5
9	C	0.5	22	ZB	1.0
10	L	0.5	23	BG	1.0
11	G	0.5	24	V	1.0
12	-	-	25	-	-
13	-	-	26	VB	0.5



MOD-204

331

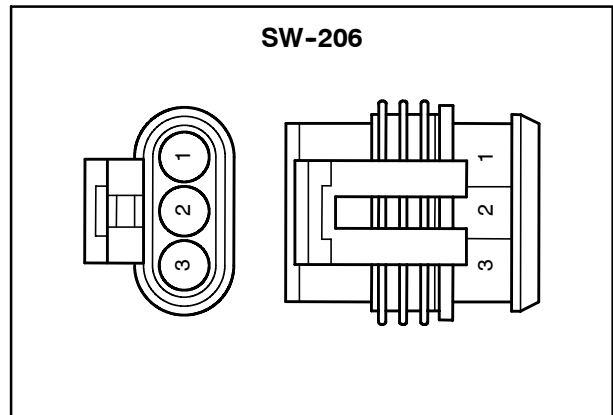
Pin	Col.	Sect.	Pin	Col.	Sect.
1	ZB	1.0	3	-	-
2	MV	1.0	-	-	-



SW-205

332

Pin	Col.	Sect.	Pin	Col.	Sect.
1	MV	1.0	3	-	-
2	BG	1.0	-	-	-



SW-206

333

1025 - VOLTAGE TOO LOW ON THE WORKING DEPTH CONTROL POTENTIOMETER**Control Module: Electronic lift control unit**

NOTE: The rear lift (EDC) does not work, but can be operated from the external switches on the mudguards.

Possible failure mode:

1. The wiring on the working depth setting potentiometer (1) is disconnected or in short to ground or the potentiometer is faulty.

Remedies:

1. Turn the starter key to the OFF position. Remove the working depth setting control panel. Are the wires and the relative connection connected?
 - A. YES - Proceed with test 2.
 - B. NO - Connect the wires and/or the connection.
2. Disconnect the control panel and the connections MOD-27 of the control unit (ECU). Is there electrical continuity between the following wires on working depth control panel connection MOD-40 and connection MOD-27?

MOD-40 pin (8) (HL) with 28 (HL) MOD-27;
MOD-40 pin (4) (VB) with 1 (VB) MOD-27;
MOD-40 pin (3) (AB) with 11 (AB) MOD-27.
 - A. YES - Proceed with test 3.
 - B. NO - Examine the wiring and eliminate the cause of the open circuit.
3. Replace the working depth setting control panel. Does the fault persist?
 - A. YES - Replace the ECU.
4. NOTE: The lift arms must be calibrated after this operation.

For the connectors, components and wiring diagrams affected, see (MOD-27, sect. 55, chap. 8, page 52), (MOD-40, sect. 55, chap. 8, page 60), (diagram 5, sect. 55, chap. 6, page 339).

1068 - MAX. RAISE LIMIT POTENTIOMETER NOT SET ON MAXIMUM VALUE**Control Module: Electronic lift control unit**

NOTE: *The rear lift (EDC) does not work, therefore the lift arms mechanical stroke cannot be calibrated.*

Possible failure mode:

1. The maximum raise limit potentiometer (1) is not turned fully clockwise. This fault can be displayed during lift arms calibration (24 - Perform arms calibration).

Remedies:

1. Is the maximum raise limit potentiometer turned fully clockwise?
 - A. YES - Proceed with test 2.
 - B. NO - Turn the potentiometer fully clockwise.
2. Turn the starter key to the OFF position. Turn the starter key to the ON position. Does the fault persist?
 - A. YES - Proceed with test 3.
3. Replace the lift control panel. Does the fault persist?
 - A. YES - Replace the ECU.

For the connectors, components and wiring diagrams affected, see (MOD-27, sect. 55, chap. 8, page 52), (MOD-43, sect. 55, chap. 8, page 61), (diagram 5, sect. 55, chap. 6, page 339).

2047 - CLUTCH PEDAL SWITCH TOO HIGH**Control Module: Power Shuttle control unit (with Dual Command (2 Speed Power Shift) function)****NOTE:** *The tractor starting movement may be abrupt.***Possible failure mode:**

1. The double switch (1) on the clutch pedal is not correctly positioned/adjusted.

Remedies:

1. Connect the connector tool to the diagnosis socket (black) and turn the starter switch to the ON position, then select the HA MENU. Move the Shuttle lever to forward gear and fully press down the clutch pedal.
2. When the clutch pedal is released, does the message switch from "OFF" to "ON"?
 - A. YES - Pass on to test 2.
 - B. NO - Continue with test 3.
3. Remove the left-hand panel under the dashboard. Are the wiring and connection SW-151 connected?
 - A. YES - Continue with test 4.
 - B. NO - Connect the connection and/or wiring.
4. Disconnect the connection SW-151 on the switch and check it works. Does it work?
 - A. YES - Pass on to test 5.
 - B. NO - Replace the switch.
5. Disconnect the control panel and the connections MOD-150 of the control unit (ECU). Is there electrical continuity between pin 2 (RN) of connections and connection SW-151 of the switch?
 - A. YES - Replace the ECU.
 - B. NO - Examine the wiring and eliminate the cause of the open circuit.
6. Press the clutch pedal fully down and release slowly. Does the message switch from "OFF" to "ON" in correspondence to a percentage value of 10 - 15%?
 - A. YES - Replace the ECU.
 - B. NO - Remove the left-hand panel under the dashboard. Position the double switch on the relative slots, so that the message switches between "OFF" and "ON" in correspondence to a set value (10 - 15%).

For the connectors, components and wiring diagrams affected, see (MOD-150, sect. 55, chap. 8, pages 93 and 94), (SW-151, sect. 55, chap. 8, page 94), (diagram 26, sect. 55, chap. 6, page 389).

2085 - SHUTTLE SYNCRO SOLENOID HAS OPEN CIRCUIT**Control Module: Power Shuttle control unit (with Dual Command (2 Speed Power Shift) function)**

NOTE: If the error occurs while driving, the display will show "Cp" and the tractor will stop; error 2063 is also displayed.

NOTE: If the error appears immediately on key-ON, the HI (hare) indicator light will blink for a few seconds until error 2411 is signalled.

NOTE: The tractor is working, it is possible to use the shuttle lever forwards and also use the HI and LO pushbuttons. Reverse gear does not work, using the shuttle lever for reverse drive has no effect.

Possible failure mode:

1. The wiring related to the shuttle syncro solenoid is interrupted or disconnected.

Remedies:

1. Turn the starter key to the OFF position. Disconnect the connector of the Power Shuttle control unit MOD-150 (located under the dashboard on the left, the label indicates PS + HI-LO). Using a digital tester, check the continuity between pin 23 and pin 27. Does the test confirm continuity?
 - A. YES - Check the control unit MOD-150.
 - B. NO - Check the wiring and eliminate the cause of the open circuit between pin 23 (SG) and pin 27 (SN). The solenoid under examination is SOL-139 (shuttle mode solenoid valve). Check the connector C9 at pins C9-C4 and C9-B4.

For the connectors, components and wiring diagrams affected, see (MOD-150, sect. 55, chap. 8, pages 93 and 94), (SOL-139, sect. 55, chap. 8, page 90), (C9, sect. 55, chap. 8, pages 22 and 23), (diagram 26 and 27, sect. 55, chap. 6, pages 389 and 391).

2410 - THE SYNCHRONIZER GOVERNING THE SHUTTLE/DUAL COMMAND (2 SPEED POWER SHIFT) IS NOT ABLE TO MODIFY THE POSITION

Control Module: Power Shuttle control unit (with Dual Command (2 Speed Power Shift) function)

NOTE: *The ECU repeatedly attempts to engage the synchroniser, as shown by the flashing HI lamp on the control panel. The attempts proceed for 30 seconds, after which (if the synchroniser has not moved), the tractor is operative. If not, ERROR is displayed and the tractor is not operative. It is possible to check syncro operation even with HH MENU in SB H7 to channel 2.*

Possible failure mode:

1. The Shuttle/Dual Command (2 Speed Power Shift) synchroniser position sensor potentiometer is faulty.
2. The synchronizer is faulty.

Remedies:

1. Turn the starter key to the OFF position. Remove the rear left-hand wheel. Replace the synchronizer position sensor button (HI – LO and Shuttle). Does the fault persist?
 - A. YES - Start the engine and bring it to 1000 rpm. Disconnect the synchroniser solenoid valves (Shuttle/Dual Command (2 Speed Power Shift)) and the synchroniser position sensor potentiometer. Start the engine and accelerate to 1000 rpm. Using an external battery, alternately power-up the two Shuttle and HI – LO solenoid valves. Using a digital tester, check that the voltages to ground on pin 2 of SEN-203, or on pin 32 of MOD-150, are: ~0.96 V corresponding to forward shuttle, ~0.89 V corresponding to shuttle in neutral, ~3.62 V corresponding to shuttle in reverse gear.
 - B. NO - Check the synchroniser unit and the relative hydraulic system to eliminate the cause of the fault.

For the connectors, components and wiring diagrams affected, see (MOD-150, sect. 55, chap. 8, pages 93 and 94), (SEN-203, sect. 55, chap. 8, page 106), (diagram 26, sect. 55, chap. 6, page 389).

14002 - REAR PTO SENSOR SHORTED TO GROUND**Control Module: Control panel control unit****Possible failure mode:**

1. The rear PTO sensor wiring is shorted to ground.

Remedies:

1. Turn the starter key to the OFF position. Is connection SEN-130 and/or the sensor wiring connected?
 - A. YES - Disconnect the connection SEN-130 of the sensor and pass on to test 2.
 - B. NO - Connect the connection and/or wiring.
2. Using a digital tester, check the electrical resistance of the sensor. Is the resistance ~640 Ω ?
 - A. YES - Proceed with test 3.
 - B. NO - Replace the sensor.
3. Using a digital tester: is the terminal C6-A7 to ground ?
 - A. YES - Check the wiring and eliminate the cause of the short circuit to ground.
 - B. NO - Check the wiring and eliminate the cause of the short to terminal 5A of the control unit MOD-11.

For the connectors, components and wiring diagrams affected, see (SEN-130, sect. 55, chap. 8, page 87), (C6, sect. 55, chap. 8, pages 16, 17, 18 and 19), (MOD-11, sect. 55, chap. 8, pages 25, 26, 27, 28 and 29), (diagram 7, sect. 55, chap. 6, page 343).

14106 - FRONT PTO FITTED BUT NOT CONFIGURED**Control Module: Control panel control unit****Possible failure mode:**

1. The front PTO is fitted but not configured in the HH menus.

Remedies:

1. This procedure is used to allow the dealer to setup any options included with the transmission control system, as follows:

Procedure:

- A. Enter the mode using the service switch and navigate the H-menu tree by using the switches on the instrument cluster. select product code ZA, mode H3 and the gearbox options, the display will show "ch _ _", proceed as follows:
- B. Use the up or down buttons to select the required channel number (Ch).
- C. Then following the countdown, the options "yes" or "no" or specific numbers will appear.
- D. Use the up or down buttons to select the option.
- E. Hold down the Enter button for 1 second; a beep will confirm the setting has been saved.
- F. Pressing the Home key (Esc button) on the instrument cluster to come back out of the option.

For the connectors, components and wiring diagrams affected, see (MOD-11, sect. 55, chap. 8, pages 25, 26, 27, 28 and 29), (diagram 7, sect. 55, chap. 6, page 343).

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