BACKHOE LOADER

SERVICE MANUAL

H930, H940CB

HYUNDAI

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Problem	Cause	Remedy
Poor braking (not pulling to one side).	· Friction plates worn beyond limits or distorted. · Master cylinder fault. · Incorrect or low axle oil.	· Renew friction and free plates - both sides of relevant axle. · Check master cylinder in single and coupled pedal modes to identify fault area, service as required. · Fill axle with correct type of oil.
Brakes not releasing.	· Brake pedal spring fault. · Master cylinder fault (plunger stuck in bore). · Blocked hole in master cylinder reservoir cap. · Brake pedal free travel incorrect. · Fluid contamination and seal damage. · Kinked or crushed brake pipes. · Friction and free plates not free on splines or dowels.	· Fit a new spring. · Check master cylinder in single and coupled pedal modes to identify fault area, service as required. · Fit a new reservoir cap. · Adjust pedal free travel. · Flush system and renew hydraulic seals. · Check and renew pipes as required. · Check friction and free plates for free movement, renew if required - both sides of relevant axle.
Excessive brake noise in operation.	· Deterioration of axle oil or wrong type of axle oil. · Axle oil loss. · Friction plates worn beyond limits. · Friction and free plates in poor condition.	· Change axle oil. · Refill axle with correct oil and check for leaks. · Renew friction and free plates. · Check for distortion or surface pitting and roughness of friction and free plates (annular grooving of free plates is acceptable).
Fluid loss when machine standing for instance - overnight.	· Severe damage or slight cut or nick in the brake piston seal. Do brake piston seal leakage test.	· Strip axle, replace seal.

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8. HYDRAULIC SYSTEM RESTRICTION TEST

- SPECIFICATION

  Oil temperature 45±5°C(113±9°F)
  Engine speed High idle
  Maximum pressure at steering unit
  2 MPa (20 bar, 285 psi)
  Maximum pressure at main control valve
  1.5 MPa (15 bar, 213 psi)

- GAUGE AND TOOL

  Gauge 0~7 MPa (0~70 bar, 0~1000 psi) 2EA

This test will check for restrictions in the hydraulic system which can cause overheating of hydraulic oil.

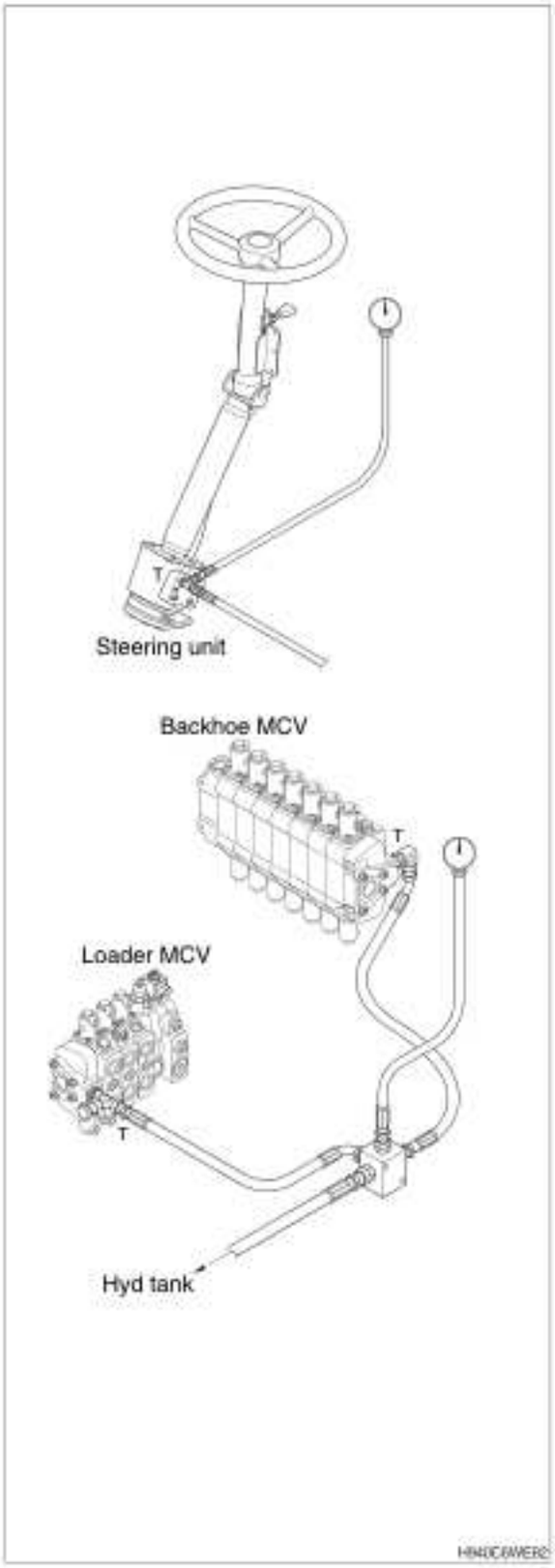
1) Install temperature reader.
   (see temperature reader installation procedure in this group)
2) Heat hydraulic oil to specifications.
   (see hydraulic oil warm up procedure in this group)
3) Connect fitting and gauge to steering valve.
4) Connect fitting and gauge to main control valve.

⚠ Do not operate steering or loader functions or test gauge may be damaged.

5) Run engine at specification and read pressure gauges.

   If pressure is more than specification at the loader control valve, check for a kinked, dented or obstructed hydraulic line. Check loader control valve for a binding spool.

   If pressure is more than specification at the steering unit, inspect neutral condition of the steering unit and steering valve for a stuck spool. Make sure orifice plugs are installed in ends of priority valve spool.
   Check for plugged orifice in priority valve and dynamic signal orifice on steering valve body.



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4. STARTING CIRCUIT

1) OPERATING FLOW

Battery(+) terminal → Master switch [(CS-74)]
→ Power relay 1 [CR-1P] → I/conn [CN-5 (1)] → Start switch [CS-2 (1)]
→ Power relay 2 [CR-35P] → I/conn [CN-5 (2)] → Fuse box [CN-36]

※ The gear selector lever is neutral position. It is necessary condition before the starting.
The gear selector has an output signal which is activated whenever the shift lever is in the neutral position. This signal can be used to control a relay and prevent engine from starting whenever the shift lever is not in the neutral position.

(1) When start key switch is in ON position

Start switch ON → Start switch [CS-2 (2, 3)] → I/conn [CN-8 (1, 2)]
→ Power relay 1 [CR-1S(1) → CR-1P(2)] → I/conn [CN-4 (1)]
→ Fuse box [CN-36]
→ Power relay 2 [CR-35S(1) → CR-35P(2)] → I/conn [CN-4 (2)]
→ Fuse box [CN-36]

(2) When start key switch is in START position

Start switch START [CS-2 (6)] → Start safety relay [CR-5 (30)→(87)] → I/conn [CN-8 (7)] → I/conn [CN-13 (10)] → Start relay [CR-23] →
Starter (terminal B^+ and M connector of start motor)

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (battery B^+) ② - GND (Power relay) ③ - GND (start key B terminal) ④ - GND (start key BR, ACC terminal) ⑤ - GND (start key C terminal) ⑥ - GND (start safety relay output)	12 V

※ GND : Ground

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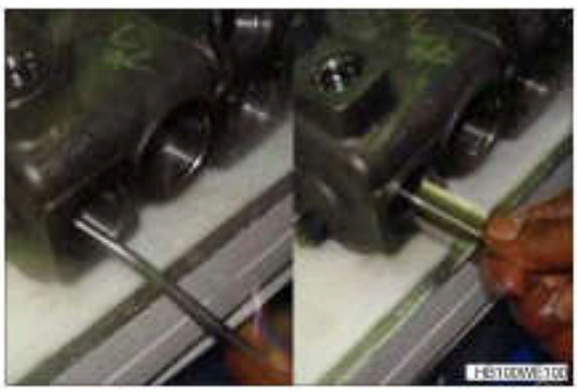
6) PRIORITY INLET SPOOL ASSEMBLY

(1) Insert orifice of (ø 0.75 mm) in the spool as shown in picture.

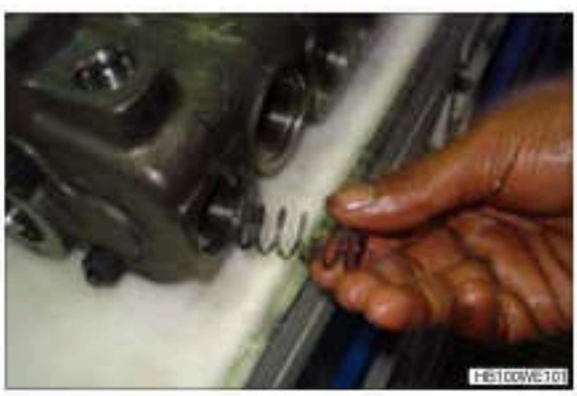


(2) Lubricate the spool cavity with hyspin VG46.

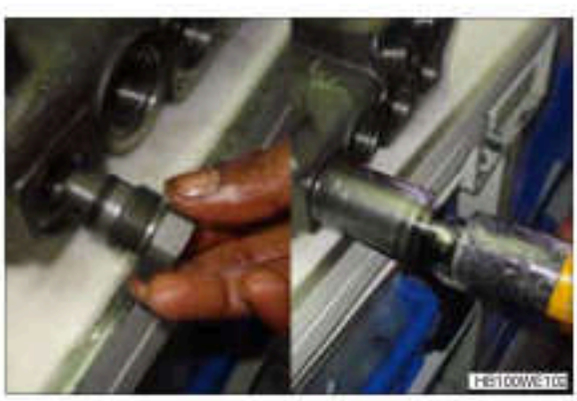
(3) Insert the spool into the spool cavity with orifice face should go inside.



(4) Insert the spring on to the spool seat.

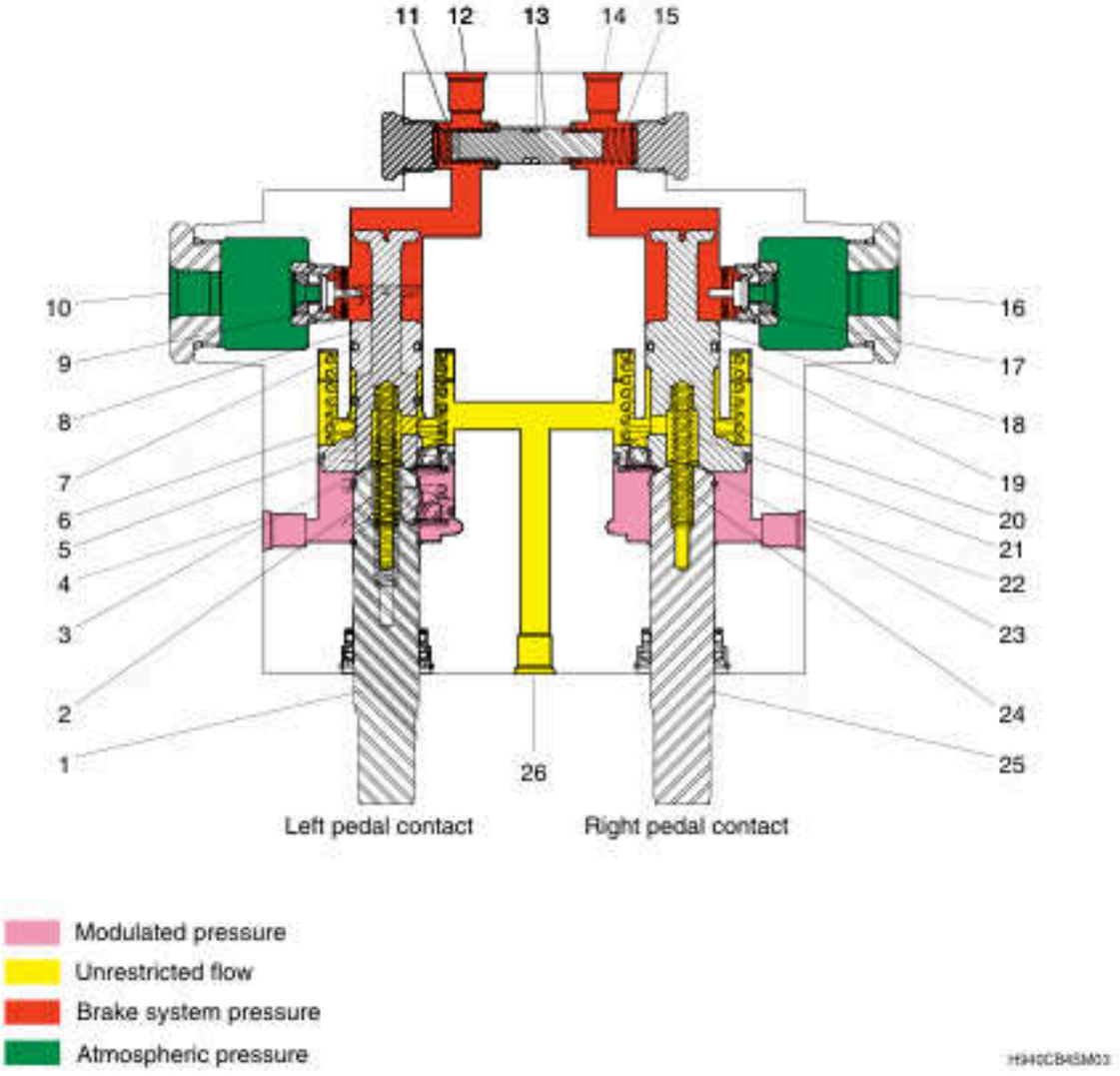


(5) Assemble the adapter and tighten it to 4.28 kgf · m (31 lbf · ft) torque (wrench 32) using pneumatic torque gun. (Make sure that washer & O-rings are present in the adapter.



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(2) Both pedals applied



Oil from the hydraulic system enters ports (4 & 22) separately and drains to outlet port (26). Both pedals are depressed forcing springs (5 & 21) to compress. Oil flowing through land areas (3 & 23) becomes restricted. Oil flow moves to close check balls (2 & 24).

Restricted oil flow at lands (3 & 23) causes pressure to act against the large diameter of pistons (8 & 18). Pistons (8 & 18) move to compress springs (6 & 20). As more push rod displacement occurs, valve assemblies (9 & 17) close, stopping brake system oil from moving to reservoir or atmosphere pressure. Additional movement of the push rods and pistons (8 & 18) forces brake system oil to the brakes causing brakes to fill through ports (12 & 14). If the brakes consume slightly different amounts of oil, spool (13) moves against either spring (11 or 15) to satisfy the original amount of brake oil of whichever side has the most required.

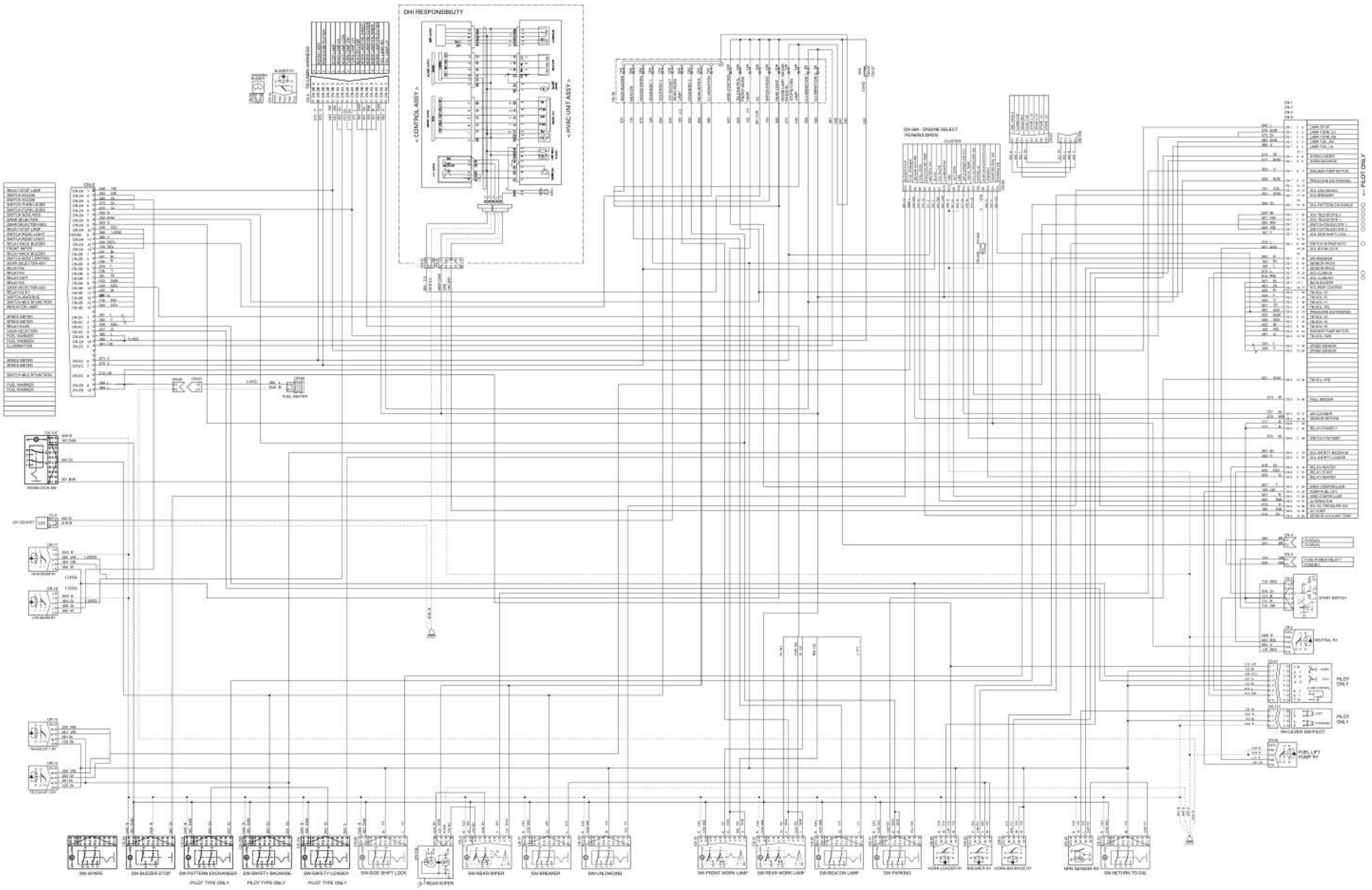
After the brakes are filled, higher brake pressure is developed by the inlet oil pressure being modulated at lands (3 & 23), causing piston (8 & 18) to generate a higher pressure at the brake ports. Brake pedal modulated feel is determined by the hydraulic areas of push rods (1 & 25) and modulated pressure at lands (3 & 23).

Maximum boosted brake pressure is limited by the inlet oil pressure at ports (4 & 22).

Additional pedal effort can cause higher brake pressure and is dependent only by the amount of pedal force applied.

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ELECTRICAL CIRCUIT (1/3, PILOT)



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