SERVICE MANUAL

L221 / L228
Tier 4B (final)
200 Series Skid Steer Loader

L221 PIN NEM479941 and above; L228 PIN NFM401546 and above

C227 / C232
Tier 4B (final)
200 Series Compact Track Loader

C227 PIN NDM471836 and above; C232 PIN NFM402195 and above

Part number 47851950
English
May 2015
Replaces part number 47712047

NEW HOLLAND CONSTRUCTION

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200 SERIES SKID STEER LOADER SERVICE

L221 / L228 TIER 4B (final)

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Vol. 1

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Vol. 2

47851950

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47888428 May 2015
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SERVICE MANUAL
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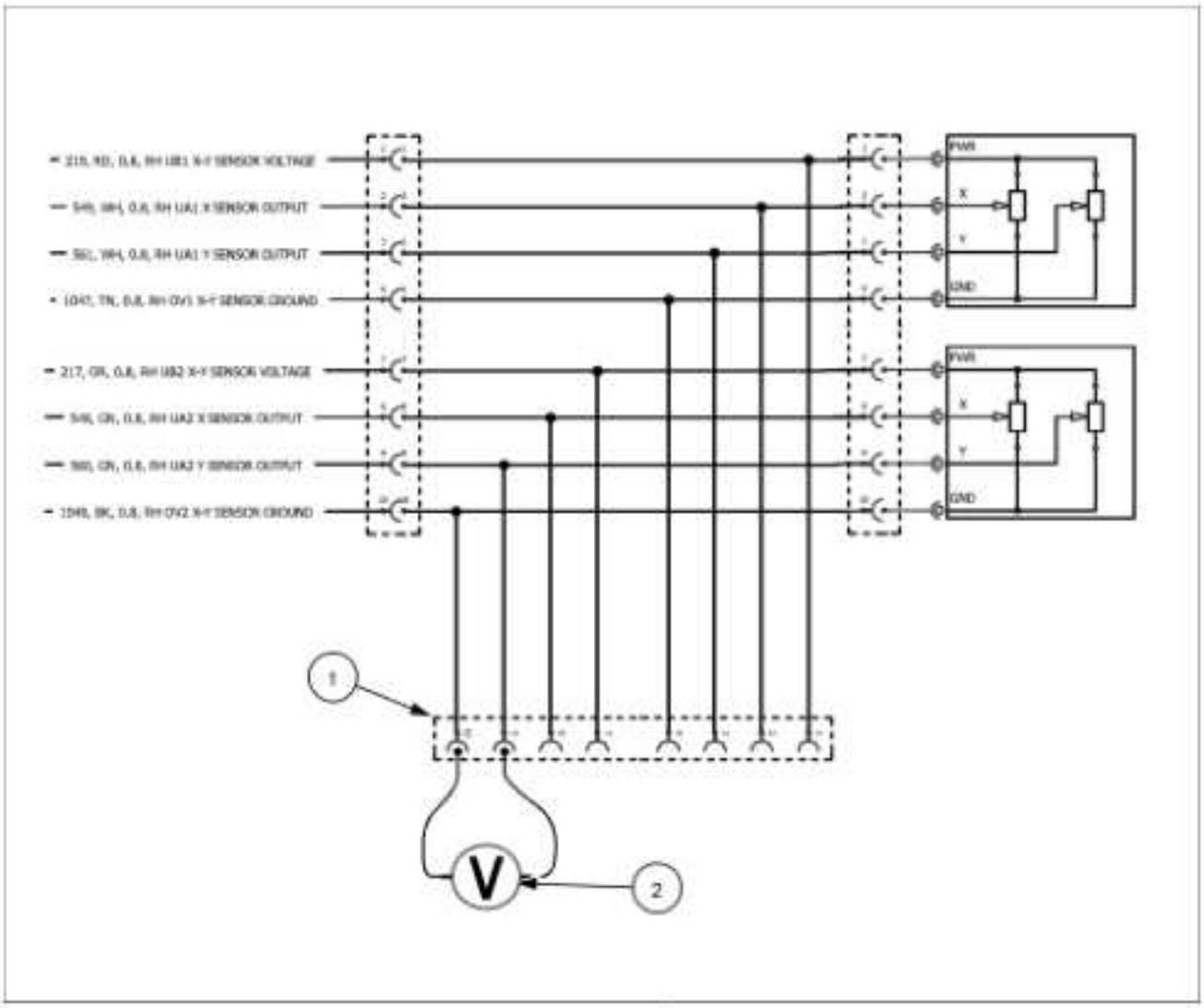
BINDER SPINE **47888428**

ELECTRICAL SCHEMATIC POSTERS **47886264**
47886270

HYDRAULIC SCHEMATIC POSTER **47886242**

ENGINE SERVICE MANUAL (sold separately) **47730922**

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RAPH12GSL03G4GA 2

Schematic legend			
(1)	Dealer supplied breakout harness	(2)	DVM set to measure voltage.

Connect the breakout harness between the two mating connectors on **X-UJMR**.

Turn the ignition switch ON.

Measure the voltage between pin 3 and pin 4 on the break out harness. The voltage should be approximately **2.5 V** while the joystick in the neutral position.

Continue measuring the voltage while slowly moving the throttle in the F-B position. The voltage should change between **0.5 V** and **4.5 V**. The voltage change should be smooth and steady as the joystick is moved between the stop points.

A. The voltage is approximately **2.5 V** in the neutral position and the voltage changes between **0.5 V** and **4.5 V**. Temporarily replace the UCM and retest. Return to step **1** to confirm elimination of the fault.

B. The voltage is not **2.5 V** in the neutral position or the voltage change is erratic. Temporarily replace the joystick and retest. Return to step **1** to confirm elimination of fault.

Wiring harnesses - Electrical schematic sheet 19 Unit Control Module (55.100.DP-C.20.E.19)
Wiring harnesses - Electrical schematic sheet 13 Cab to Chassis Interface (55.100.DP-C.20.E.13)
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1908-VCM - Rail 12VF2 - Bucket Extend Input Power Off

C232	Electro hydraulic controls
L228	Electro hydraulic controls

Context:
The UCM has sensed that the voltage on **CN4A pin 1** and **CN4A pin 8** is less than **9 V**. Diagnostic Trouble Code **1908 - VCM - Rail 12VF2 - Bucket Extend Input Power Off** has an error priority of Red.
Bucket functions are disabled while Diagnostic Trouble Code **1908 - VCM - Rail 12VF2 - Bucket Extend Input Power Off** is active.

Cause:
The UCM has sensed that the voltage on **CN4A pin 1** and **CN4A pin 8** is less than **9 V**. The fault is active while the ignition is ON, the engine is not cranking, and Diagnostic Code **1903 - VCM - VCM Supply Voltage Below Operational Limit** is not active.

Possible failure modes:

1. An open circuit in the wiring.
2. A failure of the UCM.

Solution:

1. Verify that the fault code is active.

   Connect the Electronic Service Tool to the service tool connector.

   To check for fault codes: Start and operate machine.

   A. The fault code is not recorded again. OK to return the machine to service.

   B. Fault code **1908 - VCM - Rail 12VF2 - Bucket Extend Input Power Off** is recorded again. Go to step **2**.

   C. Fault code **1908 - VCM - Rail 12VF2 - Bucket Extend Input Power Off** is recorded along with fault code **1913 - VCM - Rail 12VS1 - Bucket Curl Input Power Off**. Check fuse F-019. Check splice SP-111. Repair as required. Return to step **1** to confirm elimination of the fault.

2. Verify the harness is not damaged.

   Turn the ignition switch OFF.

   Inspect the UCM connections and the accessory power distribution fuse block #1 connections. All connections should be secure, tight, free of corrosion, abrasion, and damage.

   Inspect the harness from the UCM connector **CN4A** to the accessory power distribution fuse block #1. Verify that the harness is free of damage, corrosion, abrasion, and incorrect attachment.

   A. The wiring harness is not damaged and all connections are secure. Go to step **3**.

   B. The harness is damaged or the connectors are loose or damaged. Repair or replace the harness as required. Return to step **1** to confirm elimination of fault.

3. Test the UCM connection.

   Turn the ignition switch OFF.

   Fabricate a jumper wire that will connect from the positive battery post to UCM connector **CN4A pin 1** and **CN4A pin 8**.

   Connect the jumper from the positive battery post to UCM connector **CN4A pin 1** and **CN4A pin 8**.

   Turn the ignition switch ON.

   Go to the fault code screen and refresh the display. The fault code should no longer be active.

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Hydraulic fluid temperature control sensor - General specification

C227	
C232 TIER 4B (FINAL)	
L221	
L228	

Conversion chart

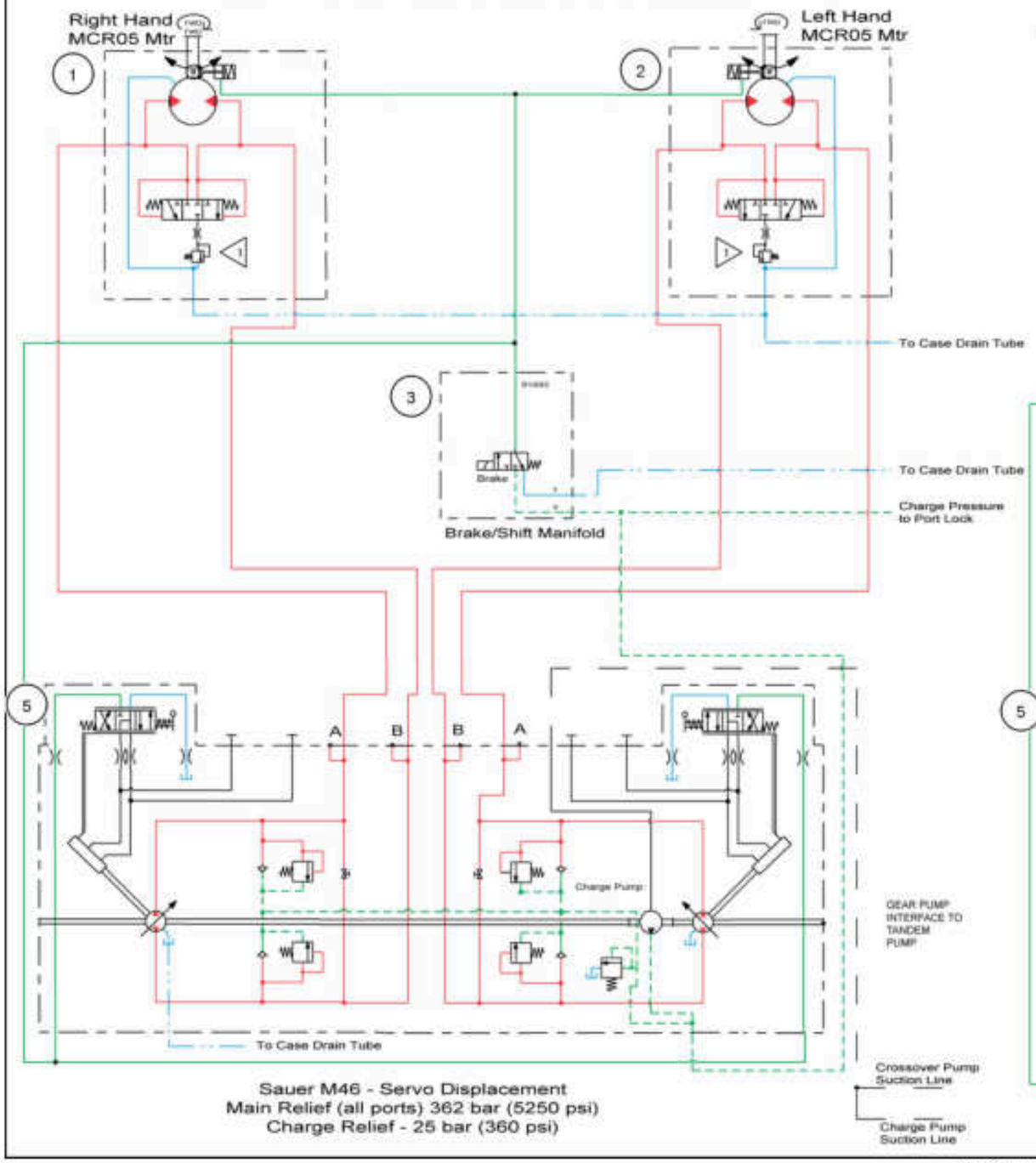
Sensor resistance	Oil temperature		Sensor resistance	Oil temperature
>128318 Ω	**<-40 °C (<-40 °F)**		**1801.2 Ω**	**35 °C (95 °F)**
128318 Ω	**-40 °C (-40 °F)**		**1457.5 Ω**	**40 °C (104 °F)**
88806.4 Ω	**-35 °C (-31 °F)**		**1187.3 Ω**	**45 °C (113 °F)**
63399.2 Ω	**-30 °C (-22 °F)**		**973.3 Ω**	**50 °C (122 °F)**
44472.7 Ω	**-25 °C (-13 °F)**		**802.8 Ω**	**55 °C (131 °F)**
32123.4 Ω	**-20 °C (-4 °F)**		**665.9 Ω**	**60 °C (140 °F)**
23479.7 Ω	**-15 °C (5 °F)**		**465.8 Ω**	**70 °C (158 °F)**
17393.7 Ω	**-10 °C (14 °F)**		**392.6 Ω**	**75 °C (167 °F)**
13020.7 Ω	**-5 °C (23 °F)**		**332.5 Ω**	**80 °C (176 °F)**
9851.1 Ω	**-0 °C (32 °F)**		**79.2 Ω**	**130 °C (266 °F)**
7528.2 Ω	**5 °C (41 °F)**		**70 Ω**	**135 °C (275 °F)**
5807.9 Ω	**10 °C (50 °F)**		**62 Ω**	**140 °C (284 °F)**
4521.3 Ω	**15 °C (59 °F)**		**55.1 Ω**	**145 °C (293 °F)**
3550 Ω	**20 °C (68 °F)**		**49.1 Ω**	**150 °C (302 °F)**
2810 Ω	**25 °C (77 °F)**		**> 49.1 Ω**	**>150 °C (>302 °F)**
2241.5 Ω	**30 °C (86 °F)**			

Conversion chart

Oil temperature	Instrument panel display
<21 °C (<70 °F)	1 bar
21 °C (70 °F)	1 bar
37 °C (99 °F)	2 bars
60 °C (140 °F)	3 bars
82 °C (180 °F)	4 bars
90 °C (194 °F)	5 bars
98 °C (208 °F)	6 bars
104 °C (219 °F)	7 bars
110 °C (230 °F)	8 bars
>110 °C (>230 °F)	8 bars

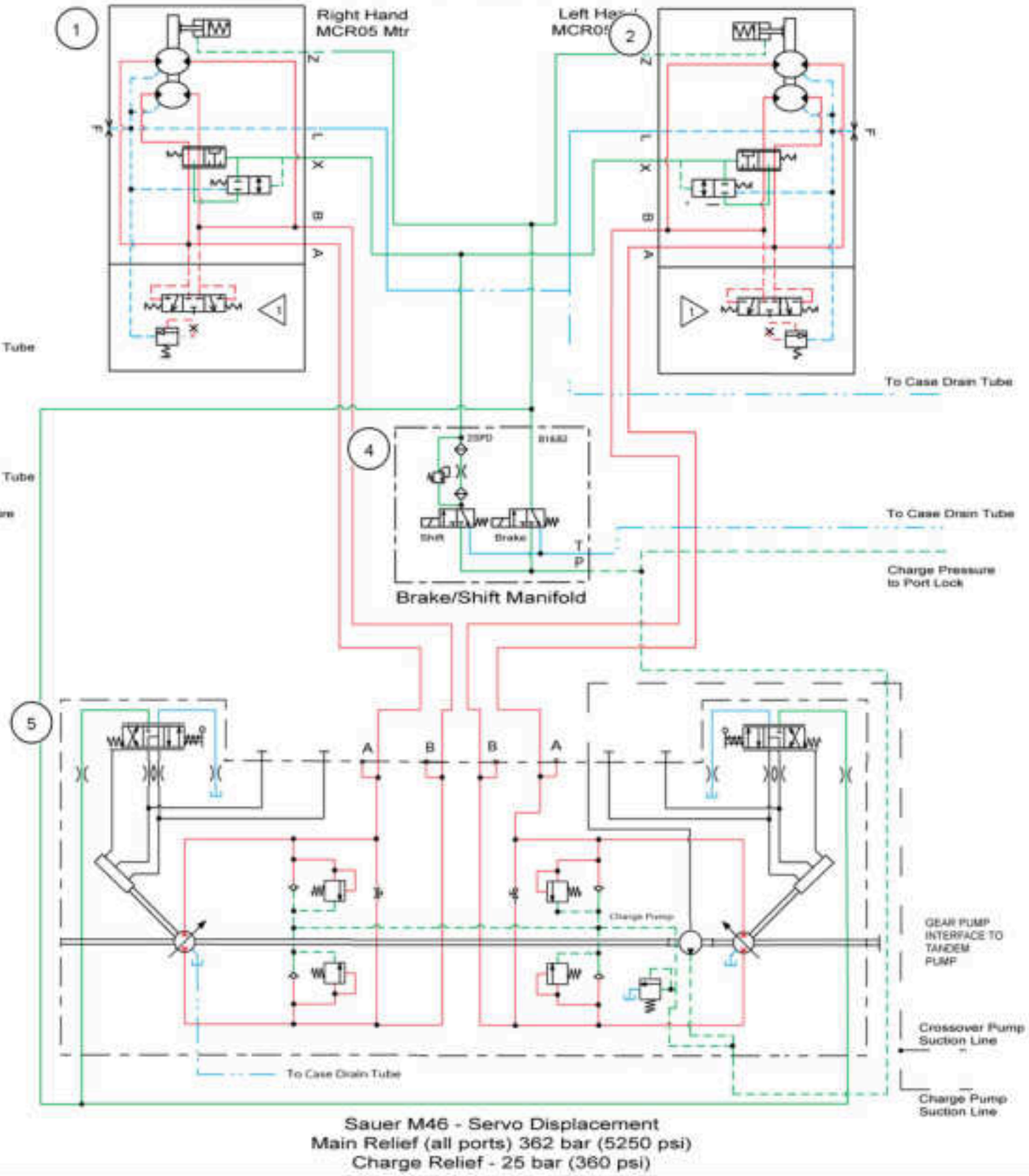
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MECHANICAL SINGLE SPEED DRIVE ASSEMBLY



Sauer M46 - Servo Displacement
Main Relief (all ports) 362 bar (5250 psi)
Charge Relief - 25 bar (360 psi)

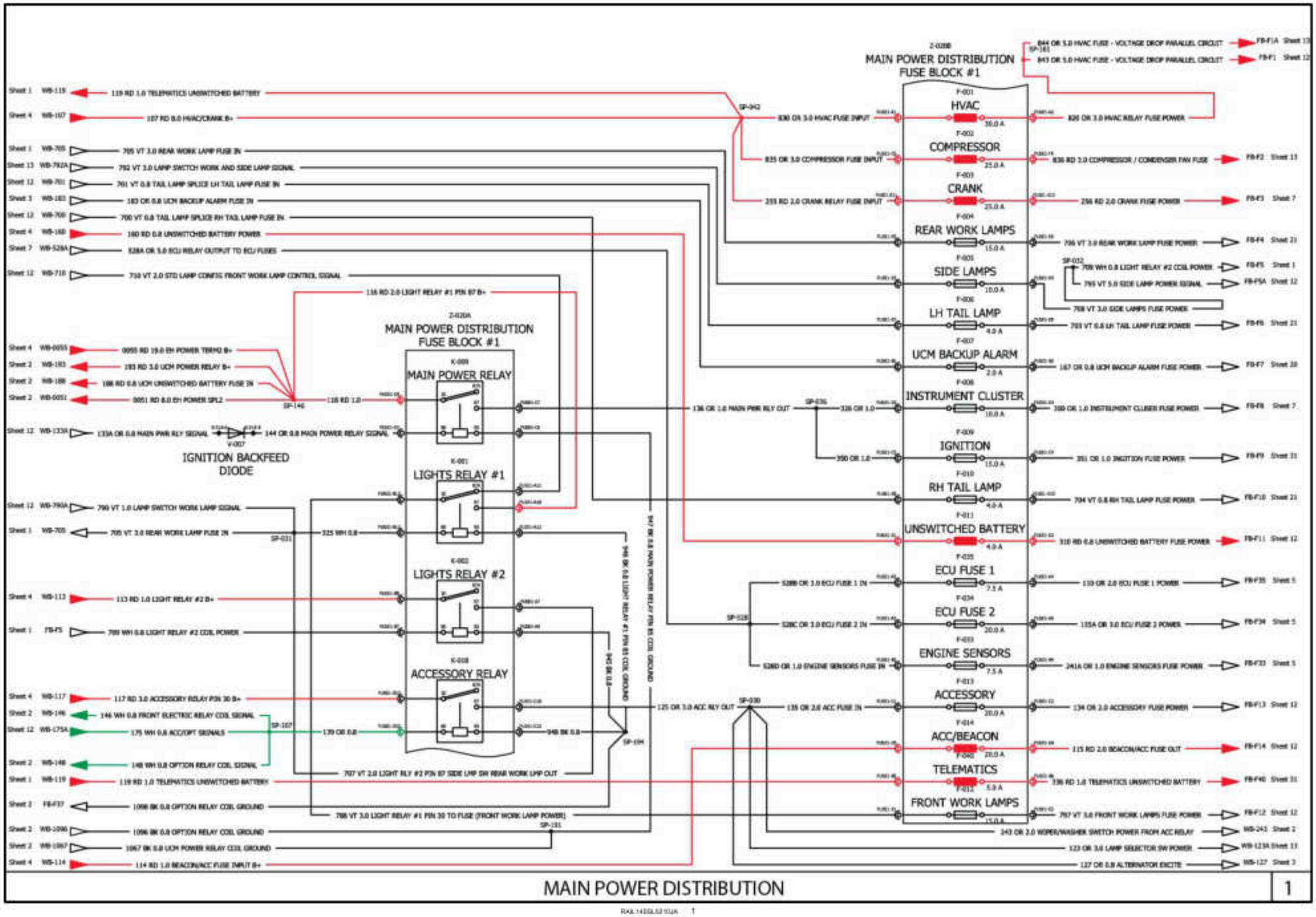
MECHANICAL TWO SPEED DRIVE ASSEMBLY



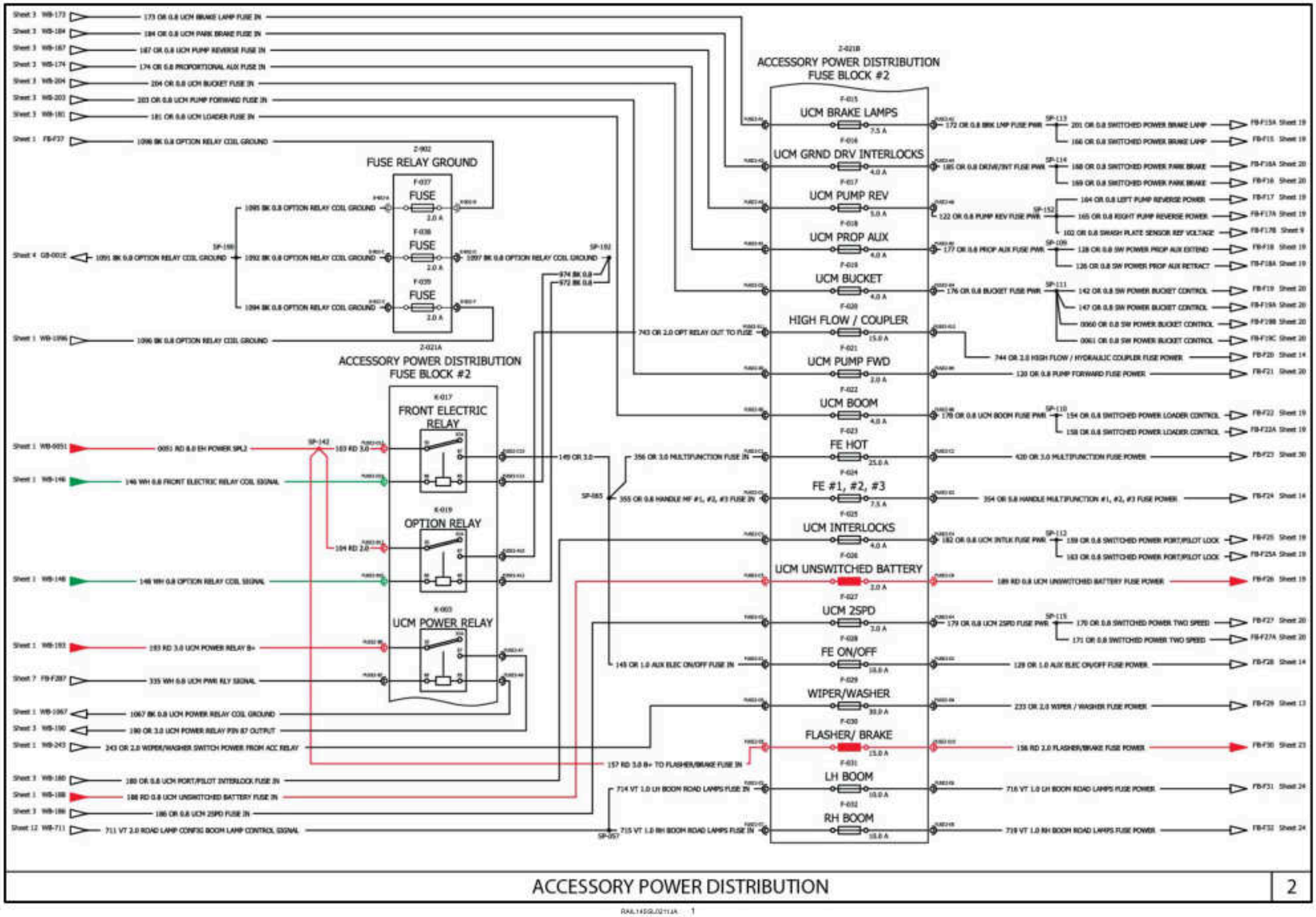
Sauer M46 - Servo Displacement
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