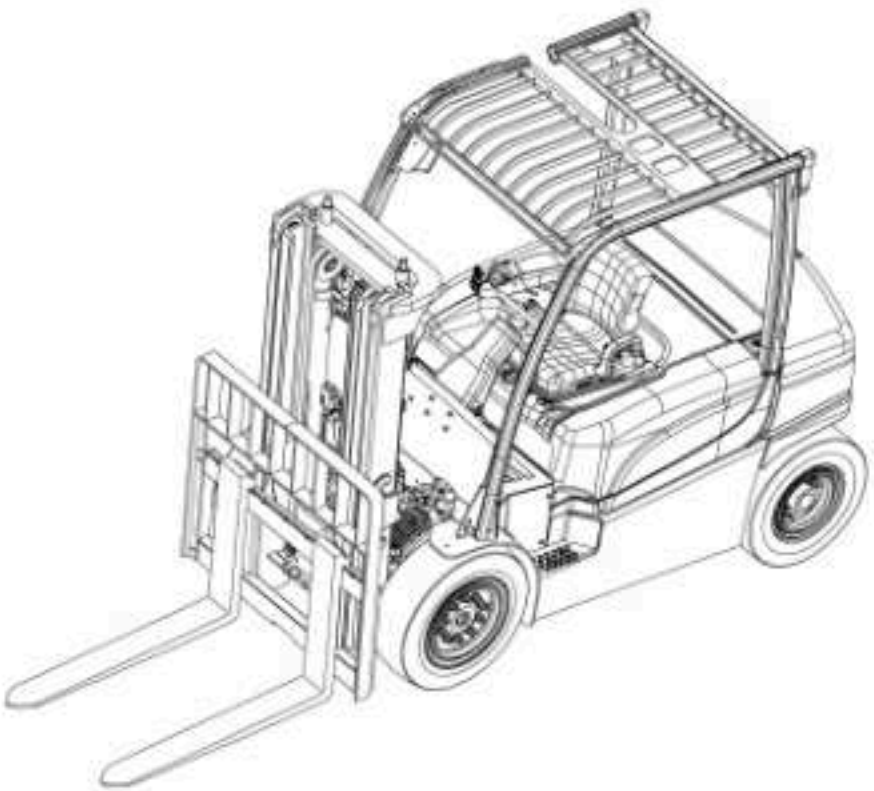
SERVICE MANUAL

A970 (J80XN, J90XN, J100XN)



Rev. 05/14

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SERVICE MANUAL CONTENTS

Section	SRM Number	Rev Date
OPERATOR'S CAB	0100 SRM 1446	08/13
AC MOTOR REPAIR	0620 SRM 1385	12/12
TRANSAXLE REPAIR	1300 SRM 1539	05/14
STEERING AXLE	1600 SRM 1360	04/13
STEERING SYSTEM	1600 SRM 1363	09/13
HYDRAULIC SYSTEM	1900 SRM 1367	08/13
HYDRAULIC CLEANLINESS PROCEDURES	1900 SRM 1620	04/13
MAIN CONTROL VALVE	2000 SRM 1334	08/13
CYLINDER REPAIR (MAST S/N A270, A271, A272, A551, A555, A559, .	2100 SRM 1382	03/14
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MAST REPAIR (S/N A626, A627, A751, A752, B590, B591, B749, B750,	4000 SRM 1540	02/14
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Battery Specifications

Table 4. E2.2-3.5XN (E45-70XN) (A268) Model Trucks

Model	Minimum Compartment Size Length × Width	Battery Size Min/Max		Weight	
		Length	Width	Minimum	Maximum
E2.2XN-E2.5XN (E45XN-E50XN)	695 x 987 mm (27.4 x 38.9 in.)	978/983 mm (38.5/38.7 in.)	681/691 mm (26.8/27.2 in.)	1050 kg (2314 lb)	1500 kg (3307 lb)
E2.2XN-E2.5XN (E45XN-E50XN)	781 x 987 mm (30.7 x 38.9 in.)	978/983 mm (38.5/38.7 in.)	739/777 mm (29.1/30.6 in.)	1150 kg (2535 lb)	1600 kg (3527 lb)
E2.2XN-E3.0XN (E45XN-E60XN)	842 x 987 mm (33.1 x 38.9 in.)	978/983 mm (38.5/38.7 in.)	800/838 mm (31.5/32.9 in.)	1317 kg (2903 lb)	1771 kg (3904 lb)
E3.2XN(E65XN)	928 x 987 mm (36.5 x 38.9 in.)	978/983 mm (38.5/38.7 in.)	900/924 mm (35.4/36.4 in.)	1410 kg (3108 lb)	1860 kg (4100 lb)
E3.2-3.5XN(E65-70XN)	1010 x 987 mm (39.8 x 38.9 in.)	978/983 mm (38.5/38.7 in.)	1001/1006 mm (39.4/39.6 in.)	1550 kg (3417 lb)	2000 kg (4409 lb)

NOTE: Tolerances of the battery compartment are +3 and 0 mm (+0.12 and 0 in.). The battery size column shows the size range that will permit the battery to still fit into a battery compartment.

NOTE: Battery compartment length is front to back. Width is side to side. The "length" dimension of the battery must fit within the battery compartment front-to-back dimension with a clearance of 0 to 13 mm (0 to 0.5 in.) maximum. Battery width must fit within the battery compartment side-to-side dimension.

WARNING

The battery must fit the battery compartment so that the battery restraint system will operate correctly. Use only batteries with the correct length shown in this table. Adjust the spacer plate to prevent the battery from moving more than 13 mm (0.5 in.) forward or backward.

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Mast Lift Chains Are Loose

POSSIBLE CAUSE

A. MAST DAMAGED
B. DAMAGED CHAIN SHEAVES
C. INCORRECT CHAIN ADJUSTMENT

CAUSE A - MAST DAMAGED

NOTE: See **Operating Manual**.

PROCEDURE OR ACTION:
Visually inspect mast for damage.

Is the mast in good condition?

YES: Go to Cause C.

NO: Repair or replace damaged components. Depending on your lift truck see, **Mast Repair, 2- and 3-Stage High Visibility Masts** 4000 SRM 1386, **Mast Repair, 2-, 3-, and 4-Stage Heavy Duty Masts** 4000 SRM 1405, **Mast Repair, 2-, 3-, and 4-Stage Masts** 4000 SRM 1338, or **Mast Repair, 2- and 3-Stage Masts** 4000 SRM 1441.

CAUSE B - DAMAGED CHAIN SHEAVES

PROCEDURE OR ACTION:
Inspect chain sheaves.

Do chain sheaves rotate freely without noise?

YES: Go to Cause C.

NO: Replace chain sheaves. Depending on your lift truck see, **Mast Repair, 2- and 3-Stage High Visibility Masts** 4000 SRM 1386, **Mast Repair, 2-, 3-, and 4-Stage Heavy Duty Masts** 4000 SRM 1405, **Mast Repair, 2-, 3-, and 4-Stage Masts** 4000 SRM 1338, or **Mast Repair, 2- and 3-Stage Masts** 4000 SRM 1441.

CAUSE C - INCORRECT CHAIN ADJUSTMENT

PROCEDURE OR ACTION:
Inspect lift chains. Depending on your lift truck see, **Mast Repair, 2- and 3-Stage High Visibility Masts** 4000 SRM 1386, **Mast Repair, 2-, 3-, and 4-Stage Heavy Duty Masts** 4000 SRM 1405, **Mast Repair, 2-, 3-, and 4-Stage Masts** 4000 SRM 1338, or **Mast Repair, 2- and 3-Stage Masts** 4000 SRM 1441.

Are the chains in good condition and adjusted correctly?

YES: See Observed Symptoms, Mast or Carriage Binding, Page 9070-30-27.

NO: Adjust or replace chain.

END SYMPTOM

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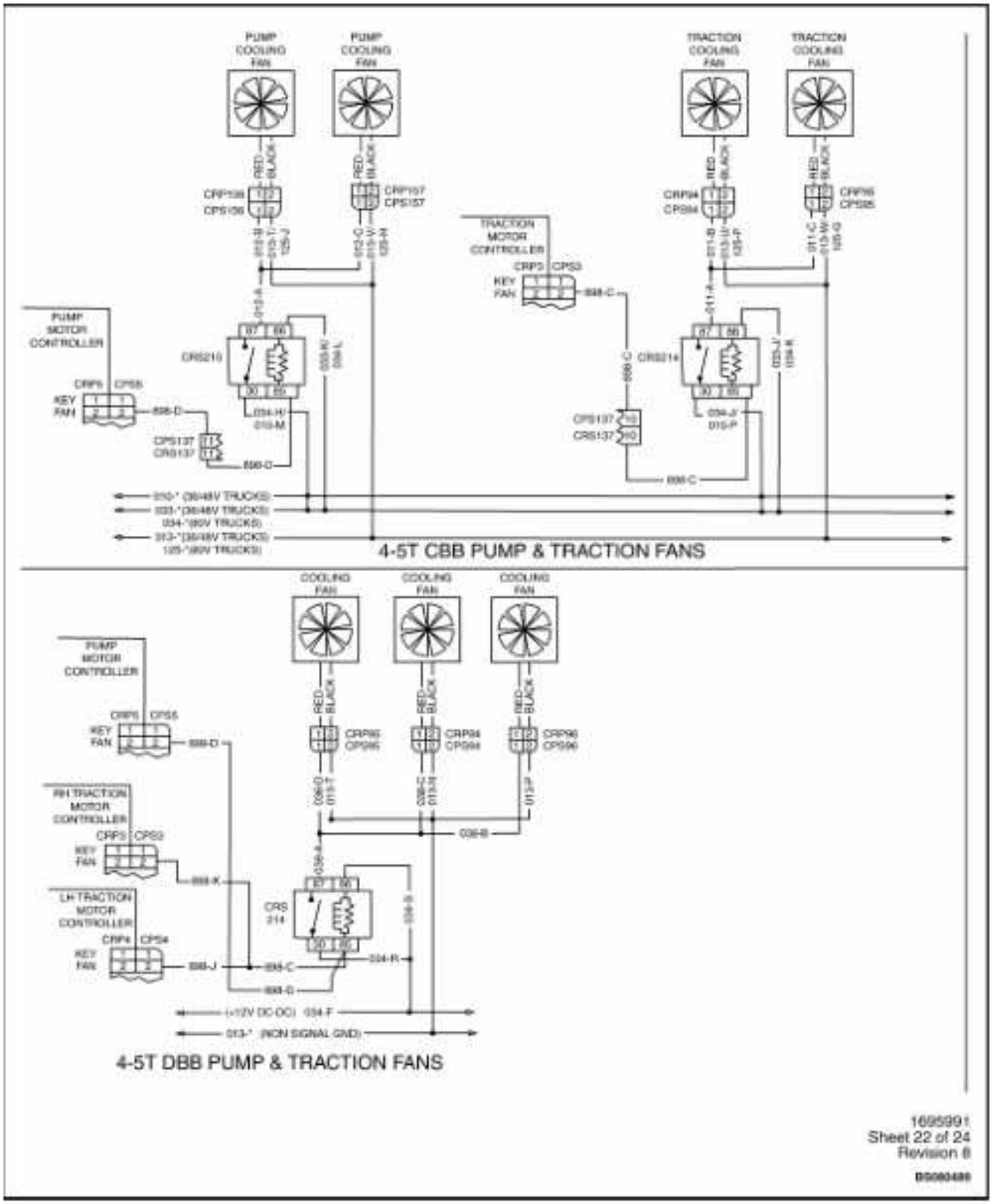


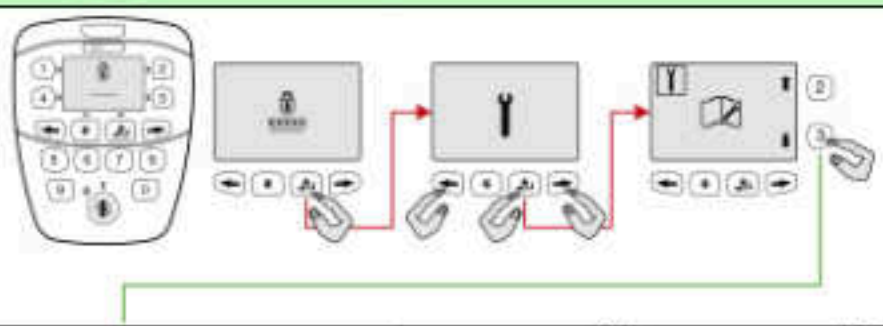
Figure 1. Wiring Diagram/Schematic (Sheet 22 of 24)

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TSP Steer Axle Calibration Required (Cont)

CAUSE D

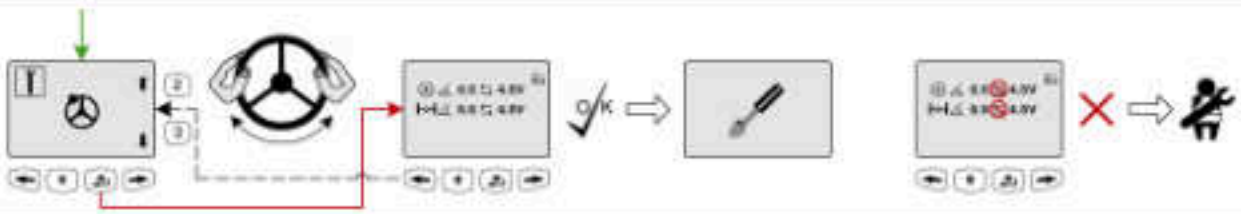
Calibration Process--Go to Display Menu



Enter SERVICE Password→ ☞* ⇆Diagnostics→ ☞* ↓↑Steering Sensor

CAUSE D1

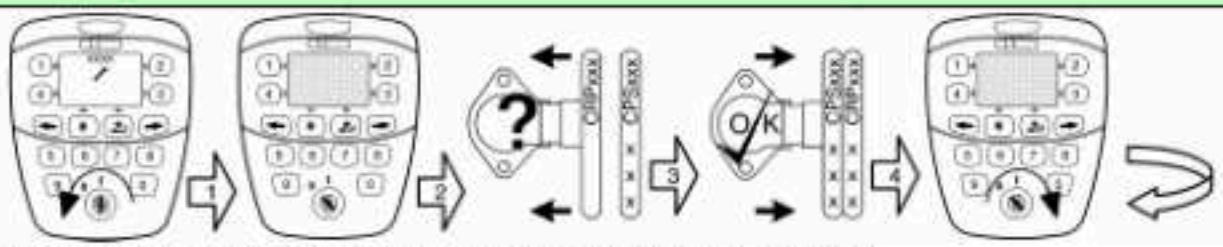
Steering Sensor Values



1. ☞*→ Rotate steering wheel ↑ Values vary >0.5V <4.5V = H→ Proceed with Calibration→ Cause D3↓
2. ☞*→ Rotate steering wheel ↑ Values =the same = X=Steer Mechanism/Faulty Sensor→ Go to 3↓
3. Check Steer Mechanism Operation→ Mechanism H→ Cause D2↓ Mechanism X Go to 4↓
4. See **Steering System** 1600 SRM 1331/**Steering System** 1600 SRM 1363 repair.

CAUSE D2

Steer Sensor(s) Replacement



1. Power **OFF**→ Disconnect sensor **Do not discard.**→ Install new sensor→ Power **ON**→ Go to 2↓
2. See **Electrical System** 2200 SRM 1337/**Electrical System** 2200 SRM 1369.

(continued on next page)

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High Tire Wear - Steer Axle

POSSIBLE CAUSE

A. RUNNING OVER OIL/SOLVENTS AND DEBRIS
B. EXCESSIVE SPEED ON TURNS AND STOPS
C. TURNING WITH MACHINE STOPPED OR NO LOAD ON FORKS
D. LOW PNEUMATIC TIRE INFLATION
E. HIGH PNEUMATIC TIRE INFLATION
F. FAILED WHEEL BEARINGS
G. LOOSE TIE RODS

CAUSE A - RUNNING OVER OIL/SOLVENTS AND DEBRIS

PROCEDURE OR ACTION:
Visually inspect work area for contaminates and debris.

CAUSE B - EXCESSIVE SPEED ON TURNS AND STOPS

PROCEDURE OR ACTION:
Reduce speed and spinning of wheels.

CAUSE C - TURNING WITH MACHINE STOPPED OR NO LOAD ON FORKS

PROCEDURE OR ACTION:

NOTE: Steering without load on forks puts the highest load on steer axle because of counterweight. Avoid steering wheels when not moving to reduce tire wear.
Steer while moving whenever possible.

CAUSE D - LOW PNEUMATIC TIRE INFLATION

PROCEDURE OR ACTION:
Check and adjust tire inflation. See **Operating Manual**.

CAUSE E - HIGH PNEUMATIC TIRE INFLATION

PROCEDURE OR ACTION:
Check and adjust tire inflation. See **Operating Manual**.

CAUSE F - FAILED WHEEL BEARINGS

PROCEDURE OR ACTION:
Inspect wheel bearings.

Are bearings in good condition?

YES: Tires are defective. See tire manufacturer for warranty.

NO: Replace wheel bearing. Depending on your lift truck, see **Transaxle** 1300 SRM 1330 or **Steering Axle** 1600 SRM 1360.

CAUSE G - LOOSE TIE RODS

PROCEDURE OR ACTION:
Inspect joint where tie rods are attached to pinion assembly.

Is the tie rod tight in bore?

YES: See Wheels Appear Tipped or Misaligned.

NO: Replace tie rod. Depending on your lift truck, see **Transaxle** 1300 SRM 1330 or **Steering Axle** 1600 SRM 1360.

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