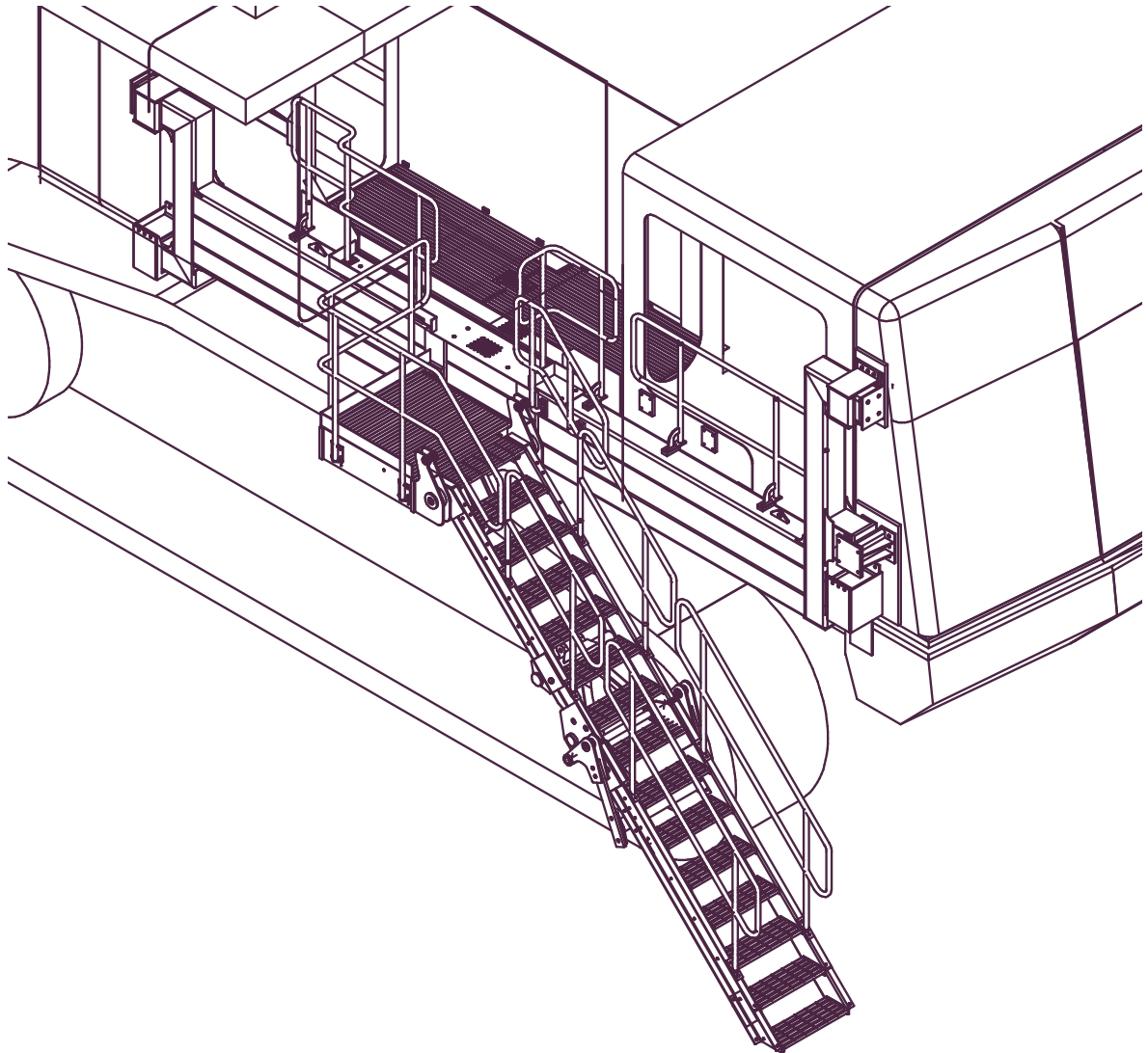




FOLDING RETRACTABLE STAIRWAY

Manual for Liebherr 994B FRS



Model No.:PSA-LIE994-FRS
Serial Nos.: 994-001FRS to - ~
Date Manufactured: Aug 2009

FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



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FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



NOTE

Follow all on-site/Mine lifting and safety procedures when installing PSFS to Truck.

INSTALLATION INSTRUCTIONS. See Drawing **22347B** (Page 4)

1. Mark out spaces for all attachments (1540 x 300 for Front Support, 500 x 275 & 800 x 400 at rear) and mark out cut out in wall. Seek assistance if result does not comply with appearance on drawing.
2. Fit and weld the three mountings, Front Support Fabrication 22 338, Rear Support Fabric'n 22 337 and Rear Top Bolting Plate 22 335 01. Reinforce behind top rear mounting per details VIEW B (this drg). Fit/weld Angle Piece 22 340 01 (or equivalent) and Gussets 22 340 04 above front mounting per details this drg.
3. Remove existing handrails (and make safe.)
4. Cut rectangular notch in wall above tank. Don't burn any cables or hoses. Go to Instruction 11 on Drg 22 330

See Drawing **22347** (Page 4)

1. Fit rubber isolator pads 01 on floor of front and rear Support Fabrications
2. Fit Handrails to Beam. Fit FRS stair and landing to beam. Fit Beam-Top Floor Piece 22 333 to Beam and FRS landing. Fit FRS power pack and controls.
3. Level the FRS Landing by using appropriate Spacers with Isolator Pads to force beam in (or out) at the top restraints and out (or in) at the bottom mountings. Eliminate any looseness in Isolators by using appropriate Spacers 16. Check that the various mountings and restarints can accommodate expected relative movements (plus/minus 20mm in length between front and rear supports) and operational machine torsion.
4. Fit Torsional Restraint Stirrups 22 334 front and rear and Longitudinal Restraint 22 336 with appropriate Isolator Pads per view 'Isolator Pads' this drawing. Fit isolator pads for sides and top of Beam in Support Fabrication.
12. Sling Beam 22 341 into position to sit on isolator pads in support fabrications. Beam will have to lean outwards at the top to pass in under the cabin walkway and mountings until lowered into support and straightened up. Secure temporarily to machine at vertical orientation.

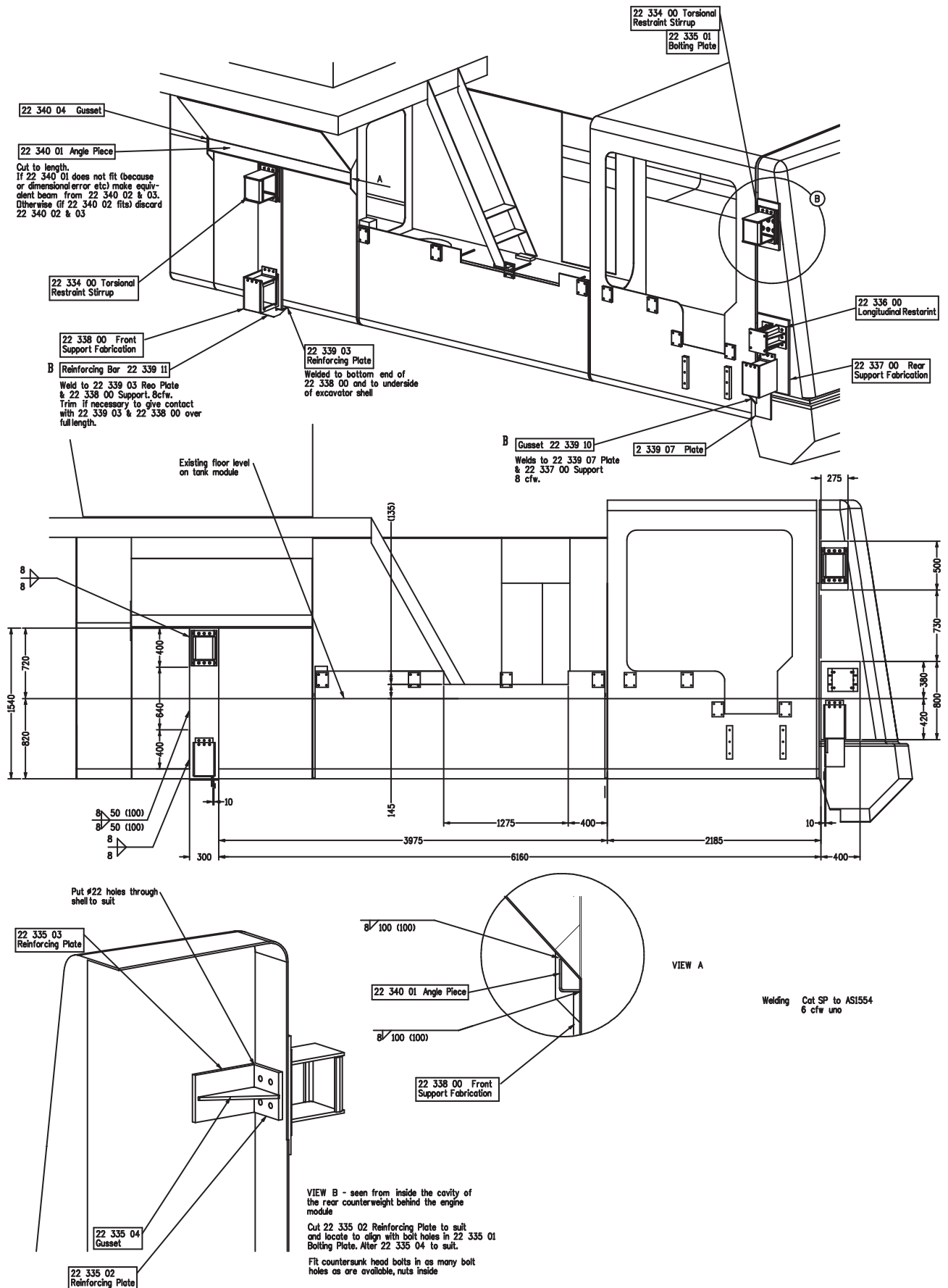
AT ALL TIMES USE SAFE WORKING PROCEDURES.

FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 1 Installation Drawings- Preparations 22347B

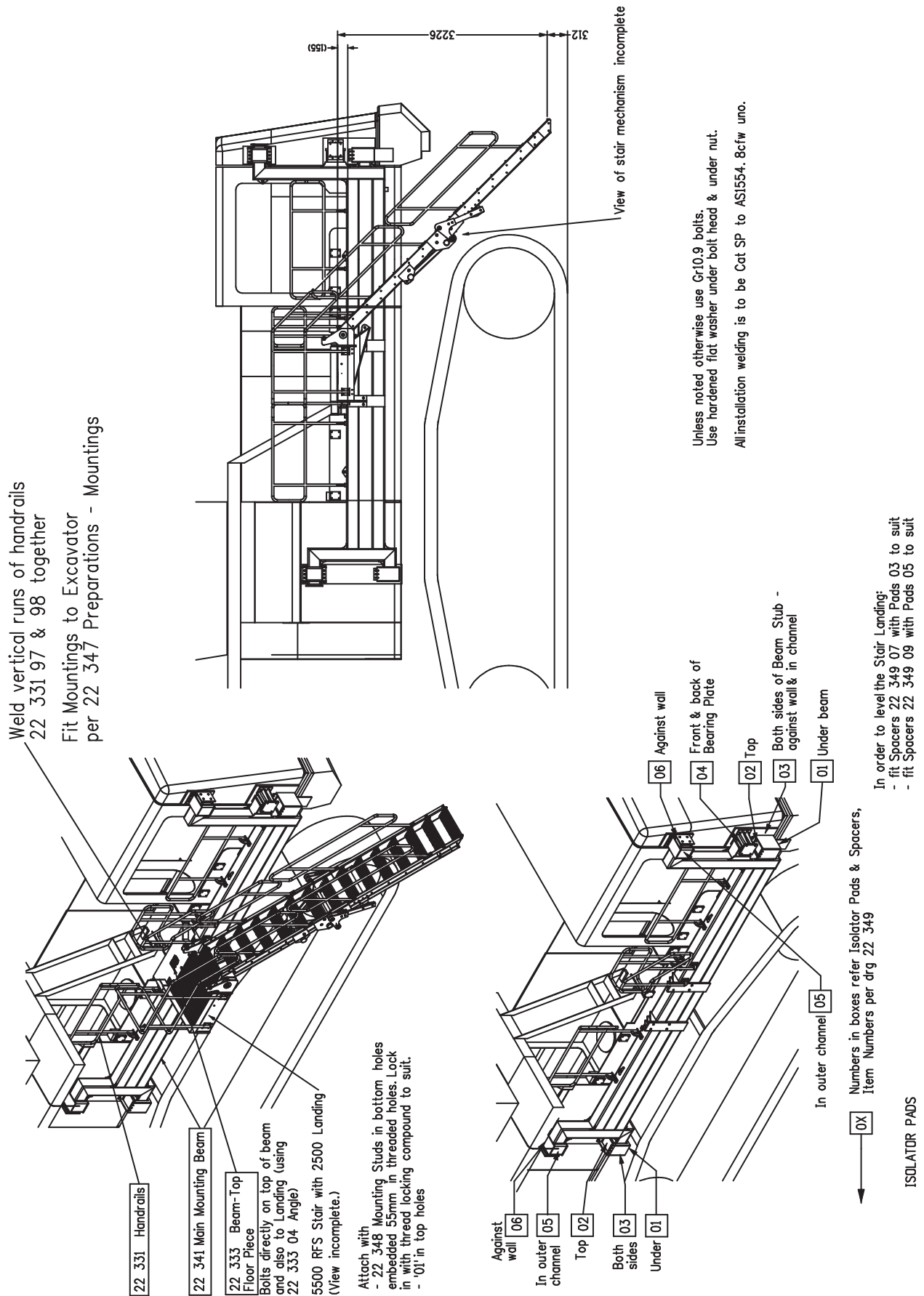


FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 1 Installation Drawings- Preparations 22 330A

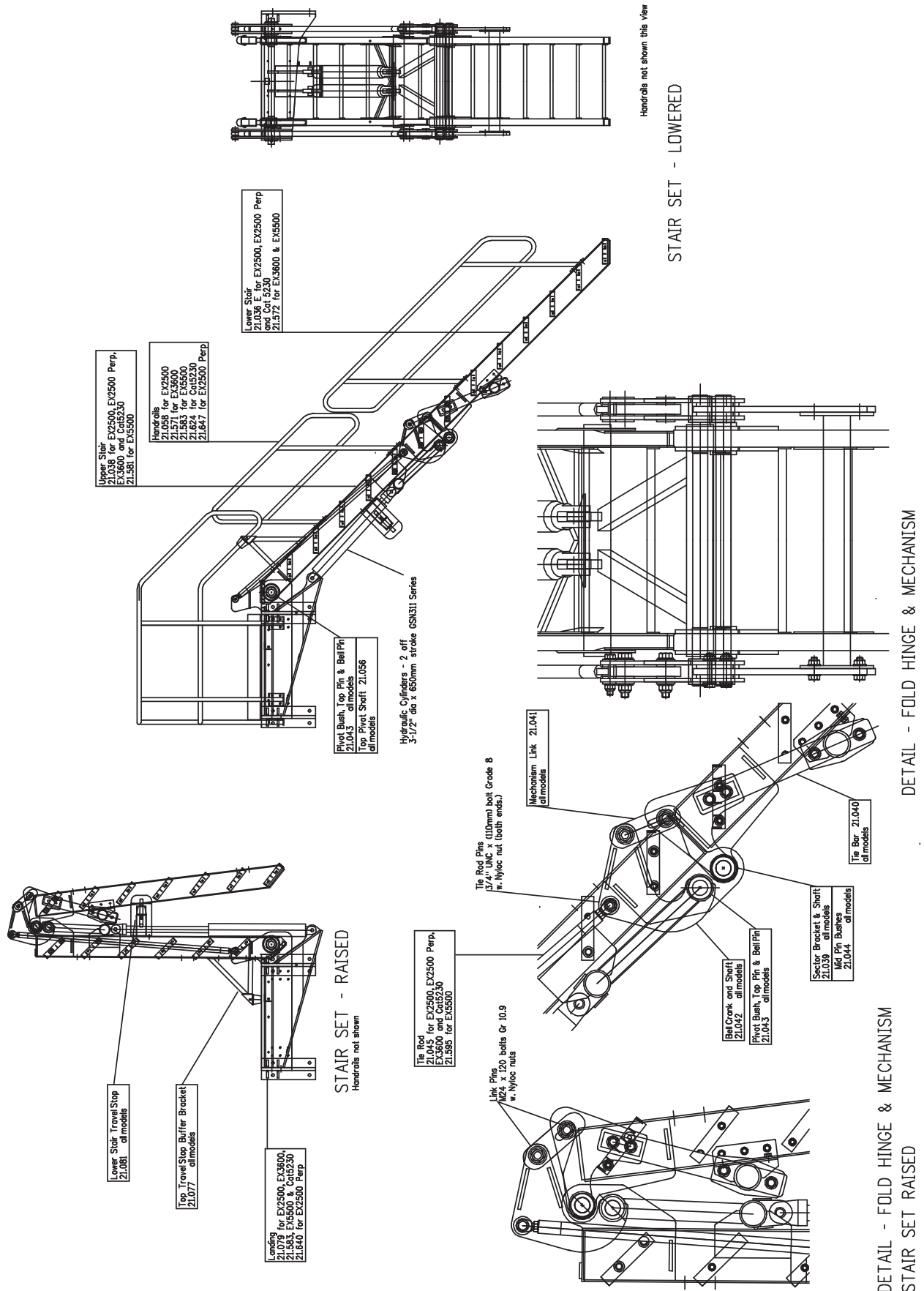


FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 1 Installation Drawings- GA Stair 21099



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 2 Operating Procedure

To Lower Stairway (from the machine)

Position excavator in a level, safe area, away from the work face, whenever possible. Position the excavator body square to the tracks, lower bucket, apply park brake and lower engine speed to idle.

Descend stairway behind cabin to lower walkway.

Check that the area below and behind the Folding Raising Stairway (FRS) is clear of people and obstacles, and lower stairway by operating the two position electrical switch adjacent to the stairway, to the down position by pressing the switch down.

Hold the switch in the down position until stairway is fully extended and lowered.

If the excavator is parked on uneven ground, the bottom of the stairway may touch the ground before the FRS is in the fully extended and lowered position.

Should this occur, descend the stairway with caution.

Bottom of stairway is designed to rest on the ground in the fully lowered and extended position, but can be used in the fully lowered position without resting on the ground.

To Raise Stairway

Ascend the stairway onto the lower walkway of the excavator.

Ensure the area around the stairway is clear of people and standing to the side, clear of the area the handrails and stairway raises into, operate the electrical switch to the raise position (up).

Hold the switch in the up position until the stairway is in the fully raised position.

The stairway is now raised and stored.

Note:

The stairway is interlocked with the swing interlock of the excavator, and the machine will not swing with the stairway out of the fully raised position.

Operation of the FRS mechanically extends the lower stair section as the stairway is lowered by means of the link rods to the upper platform of the FRS.

There is no method of individual control of the upper and lower sections.

OPERATING NOTES

NOTE: FLOW CONTROL VALVE ADJUSTMENT:

The valve should be positioned to restrict the flow and speed of the Power Step when lowering. Adjust the knob on top of the valve by turning left or right (clockwise) when the step is being lowered, until it is lowering at a safe and reasonable speed.

When it is adjusted, lock the adjusting knob by tightening the grub screw located on the side of the knob.

NOTE: MAGNETIC 'GO' SWITCH ADJUSTMENT:

The switch target trigger area is located on the opposite side and end from the cable entry point on the switch. Once it is mounted to the switch bracket, adjust the switch in or out from the stair steel trigger point, to be within 3mm - 10mm from touching each other when the stair is in the desired rest position.

[DO NOT EXCEED 10mm DISTANCE BETWEEN THE SWITCH AND STRIKER PLATE].

Test by raising and lowering the Power Step a couple of times and adjust again if necessary.

FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 3   Recommended Maintenance Procedure

Daily

Visually check stairway and structure for damage, loose components, handrails, etc.

Check for hydraulic oil leaks from hydraulic cylinders, plumbing and hoses.

Notify the appropriate supervisor for any observed damage or malfunction.

500 Hours

Grease all grease nipples. Lower or raise stairway for accessibility.

Check hydraulic oil level in power pack and top up as necessary. (Stairway in lowered position).

Check main mounting bolts for torque.

**Top up using same hydraulic oil as used in hydraulics of machine.
Thoroughly check all electrical wiring for damage, replace as necessary.**

Repeat daily check as above.

5000 Hours

Change hydraulic oil in tank of hydraulic power pack (5.0 litres).

It is recommended that the same hydraulic oil be used in the power pack as the hydraulics of the machine.

Grease all grease nipples. Lower or raise stairway for accessibility.

Retorque all main mounting bolts

Check all M12 bolts & nuts holding rubber isolators to body and rear support plate of truck.

These can be checked by hand.

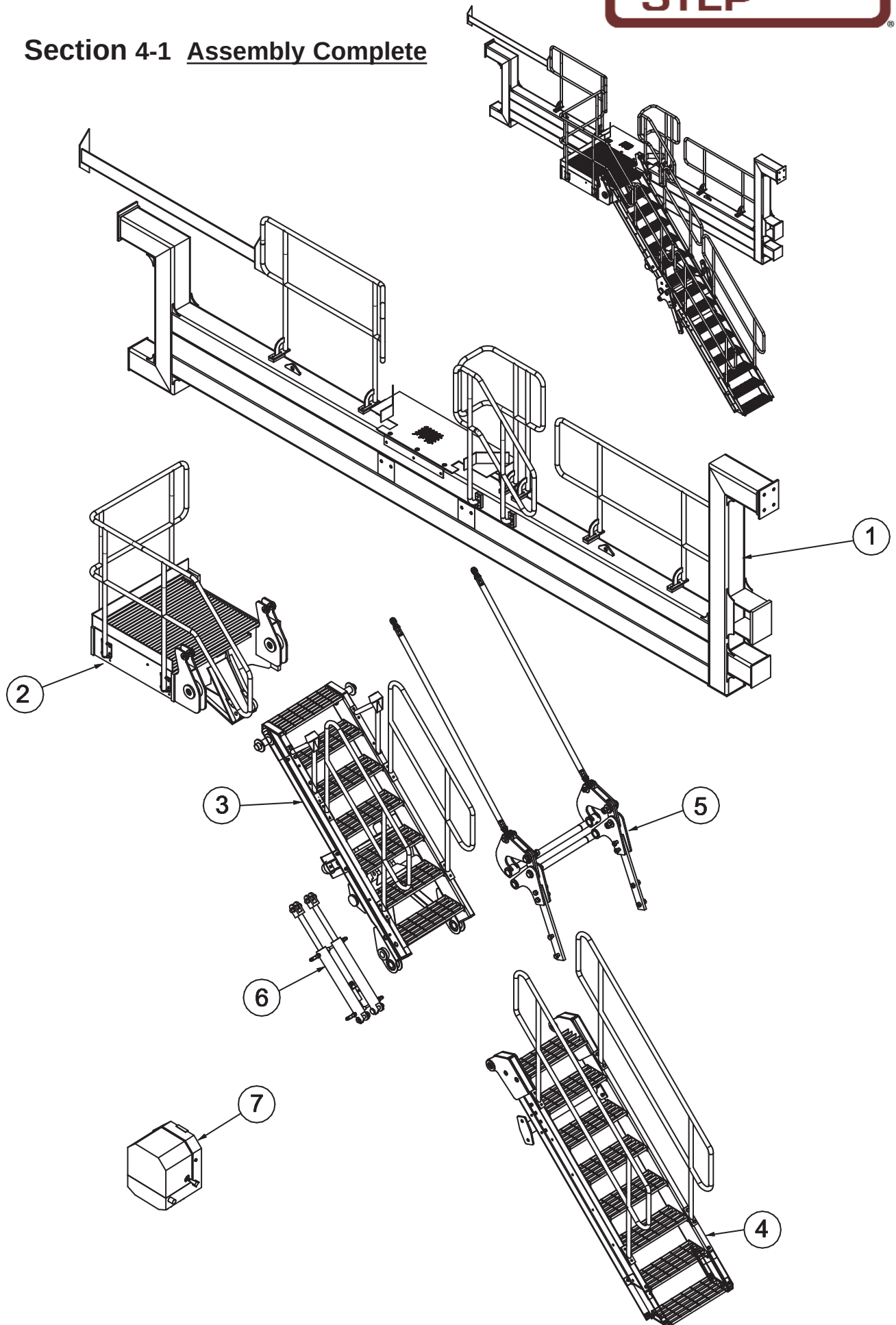
Repeat daily check as above.

FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-1 Assembly Complete



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-1 Assembly Complete

See Drawings Page 7

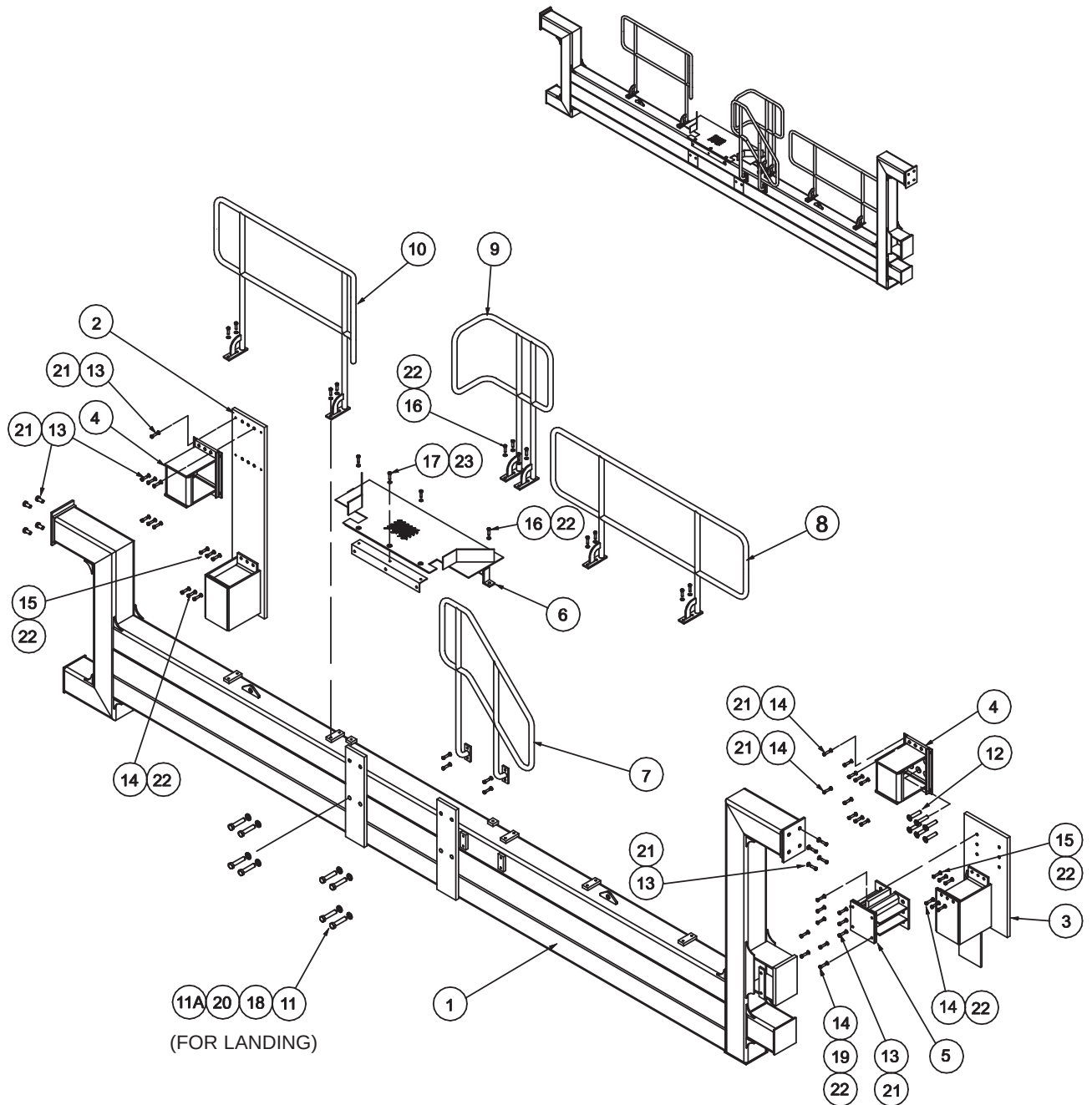
ITEM	PART NO.	PART NAME	QTY		
1	PS-22341A	BEAM MOUNTING ASSEMBLY	1		
2	PS-21075-25A	LANDING ASSEMBLY	1		
3	PS-21843A	STAIR - UPPER - ASSEMBLY	1		
4	PS-21572A	STAIR - LOWER - ASSEMBLY	1		
5	PS-35029A	PIVOT ASSEMBLY	1		
6	PS-63009-ASSY	HYDRAULIC ASSEMBLY COMPLETE	1		
7	PS-80104P-FRS	HYDRAULIC - POWER UNIT-ASSEMBLY (Including Cradle)	1		

FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-2 Mounting Assembly PS-22341A



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-2 Mounting Assembly PS-22341A

Parts List

See Drawing Page 11

Item	Part No.	Part Name	Qty		
1	PS-22341	MAIN SUPPORT BEAM	1		
2	PS-22338	FRONT SUPPORT FABRICATION	1		
3	PS-22337	REAR SUPPORT FABRICATION	1		
4	PS-22334	TORTIONAL RESTRAINT STIRRUP	2		
5	PS-22336	LONGDITUDINAL RESTRAINT	1		
6	PS-22333	TOP FLOOR PIECE - BEAM	1		
7	PS-22331- 97	HANDRAIL	1		
8	" - 96	HANDRAIL	1		
9	" - 98	HANDRAIL	1		
10	" - 99	HANDRAIL	1		
11	PS-M24X100ZP	BOLT-M24 x 100	4		
11A	PS-M24X60ZP	BOLT-M24 x 60	4		
12	PS-M20X100ZP	BOLT-M20 x 100 Socket Hd. -C/Sunk	6		
13	CPS-M20X40ZP	BOLT-M20 x 40	26		
14	CPS-M12X45ZP	BOLT-M12 x 45	4		
15	CPS-M12X40ZP	BOLT-M12 x 40	6		
16	CPS-M12X25ZP	BOLT-M12 x 25	18		
17	CPS-M10X15ZP	BOLT-M10 x 15	3		
18	PS-M24NZP	NUT-M24	4		
19	PS-M12NZP	NUT-M12	4		
20	PS-M24WH	WASHER - HARDENED- M24	12		
21	CPS-M20WH	WASHER - HARDENED- M20	26		
22	CPS-M12WH	WASHER - HARDENED- M12	32		
23	CPS-M10WH	WASHER - HARDENED- M10	3		

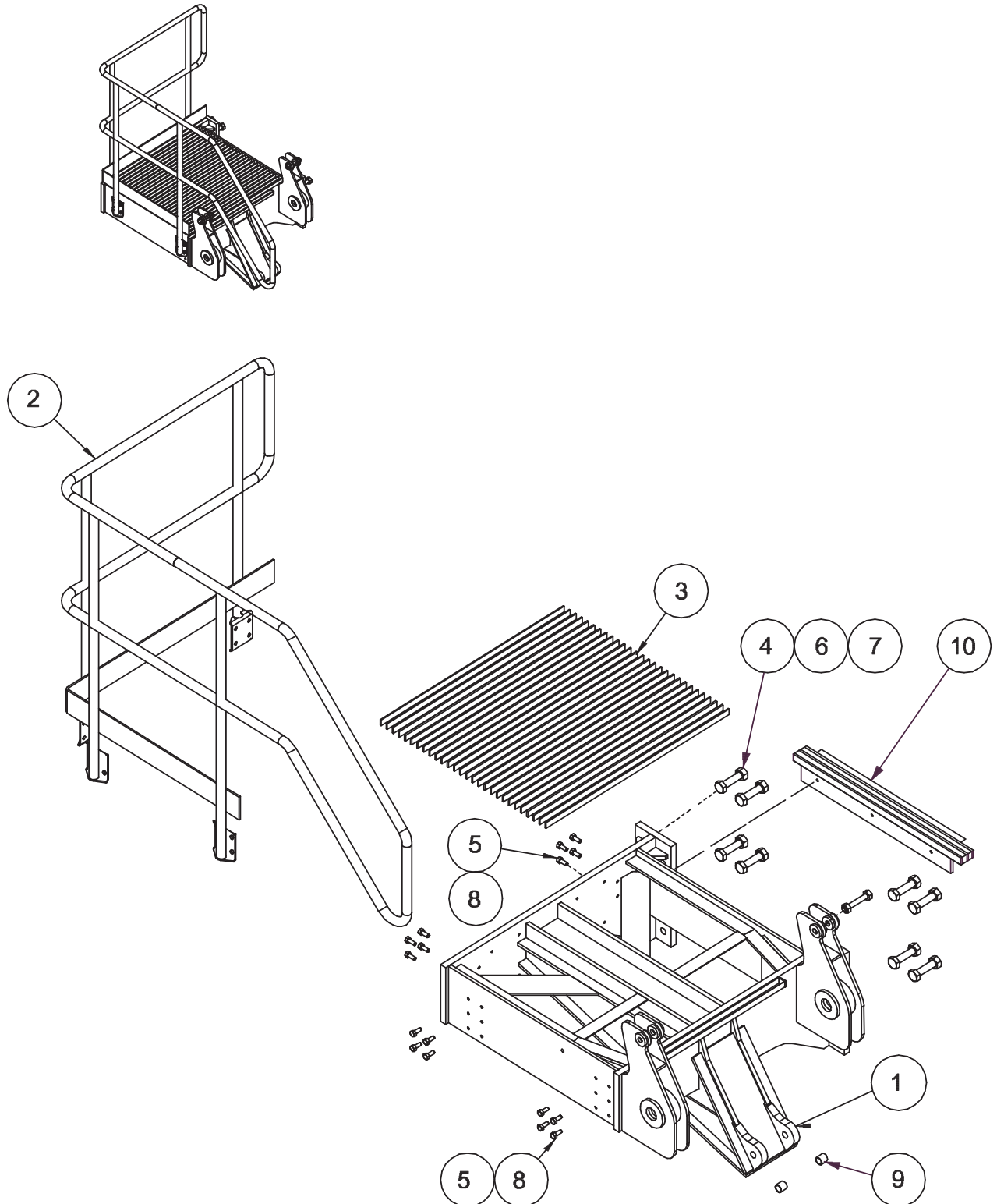
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-3 Landing Assembly PS-21075-25A

See Parts List Page 14



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-3 Landing Assembly PS-21075-25A

See Drawing Page 13

Item	Part No.	Part Name	Qty		
1	PS-21079	LANDING	1		
2	PS-21571-LHR	HANDRAIL-LANDING	1		
3	PS-21055	LANDING-GRID	1		
4	PS-M24 x 100ZP	BOLT- M24 x 100	8		
5	CPS-M12 x 30ZP	BOLT- 12 x 30	19		
6	CPS-M24WH	WASHER-HARDENED-M24	16		
7	PS-M24NZP	NUT- M24	8		
8	CPS-M12WH	WASHER-HARDENED-M12	19		
9	PS-63009-B	BUSHES-CLEVIS	2		
10	PS-21610	INFILL PANEL	1		

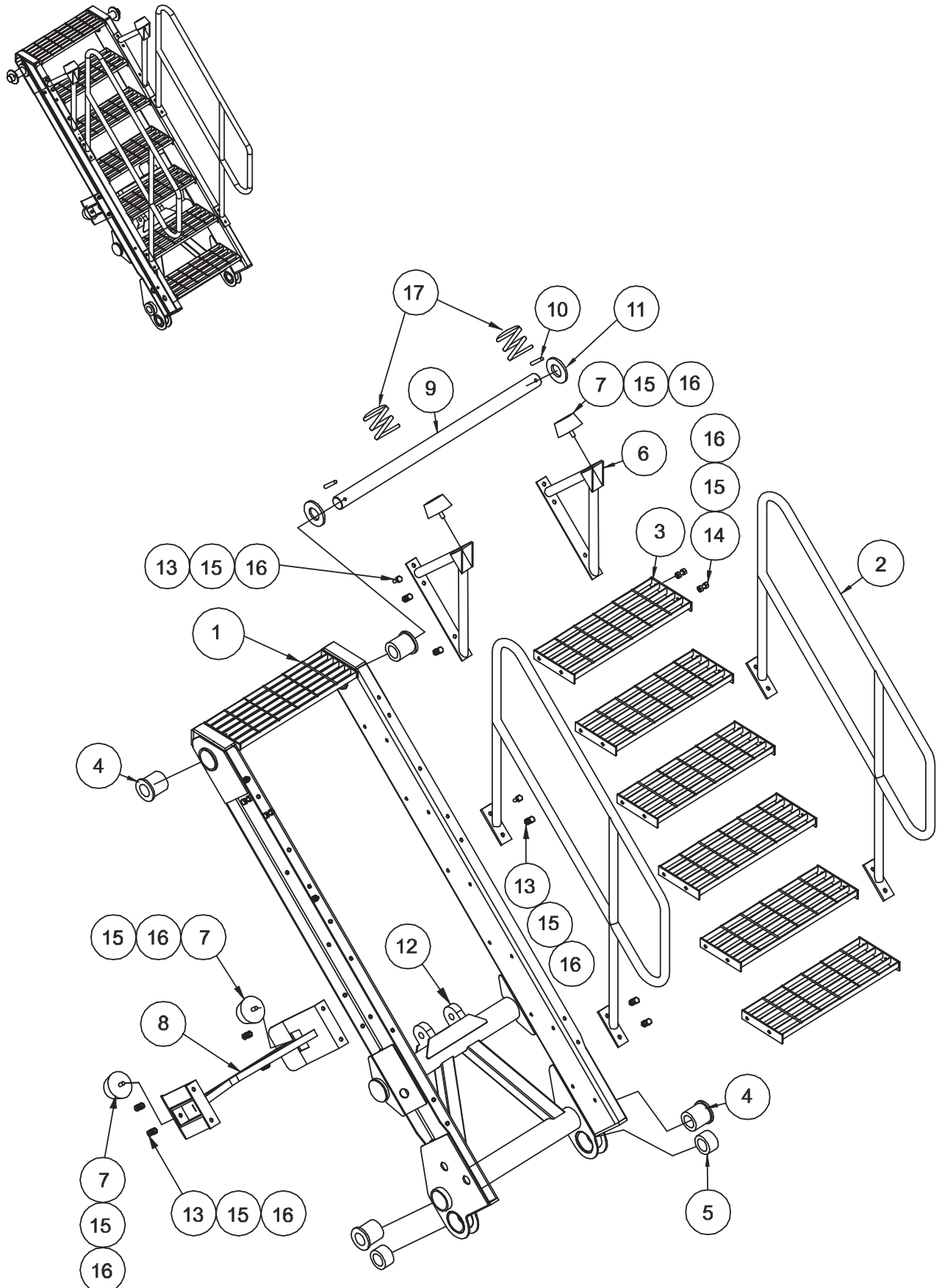
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-4 Stair - Upper Assembly PS-21843A

See Parts List Page 16



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-4 Stair Upper Assembly PS-21843A

Parts List

See Drawing Page 15

Item	Part No.	Part Name	Qty		
1	PS-21843	STRINGER ASSEMBLY	1		
2	PS-21583-USH	HANDRAIL-UPPER	2		
3	PS-21556	TREAD STEP	7		
4	PS-21043	BUSHING UPPER & CRANK PIVOT	4		
5	PS-21044	BUSHING-CENTER-PIVOT	2		
6	PS-21077	BUFFER-FRAME-TRAVEL	2		
7	PS-40001	RUBBER STOP	4		
8	PS-21081	BUFFER-FRAME-LOWER-STAIR	1		
9	PS-21056	PIVOT-PIN-TOP	1		
10	CPS-M10X80PR	ROLL-PIN-M10 x 80	2		
11	PS-21049-15	WASHER-MACHINED	2		
12	PS-63009-B	BUSHES-CLEVIS	2		
13	CPS-M12X35ZP	BOLT-M12 x 35	18		
14	CPS-M12X30ZP	BOLT-M12 x 30	32		
15	CPS-M12WH	WASHER-HARDENED-M12	100		
16	CPS-M12NZP	NUT-M12	58		
17	PS-38998-C	FRS-SPRING SET (Not included in Assy)	1		

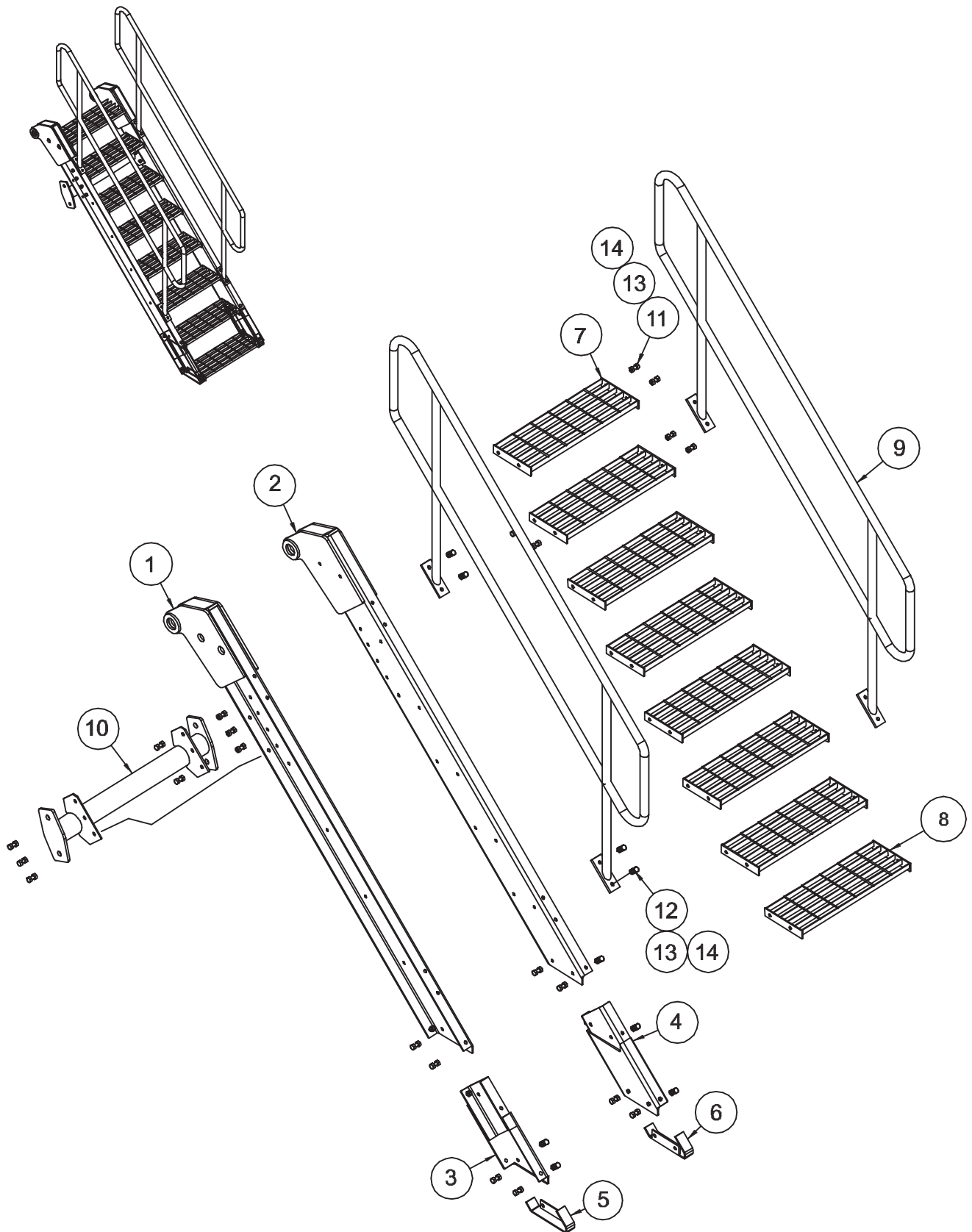
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-5 Stair Lower Assembly PS-21572A

See Parts List Page 18



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-5 Stair Lower Assembly Parts List

See Drawing Page 17

Item	Part No.	Part Name	Qty		
1	PS-21036-L	STAIR STRINGER-LH	1		
2	PS-21036-R	STAIR STRINGER-RH	1		
3	PS21037L	STAIR-EXTENSION-LH	1		
4	PS21037R	STAIR-EXTENSION-RH	1		
5	PS-21034L	STAIR-STILE-CAP-LH	1		
6	PS-21034R	STAIR-STILE-CAP-RH	1		
7	PS-21553	TREAD-STEP-SMALL	1		
8	PS-21556	TREAD-STEP-STD	7		
9	PS-21571-LSH	HANDRAIL-LOWER SECTION	2		
10	PS-36021	LINKAGE-TORQUE-TUBE	1		
11	CPS-M12X35ZP	BOLT-M12 x 35	54		
12	CPS-M12X30ZP	BOLT-M12 x 30	8		
13	CPS-M12NZP	NUT-M12	124		
14	CPS-M12WH	WASHER-HARDENED-M12	62		

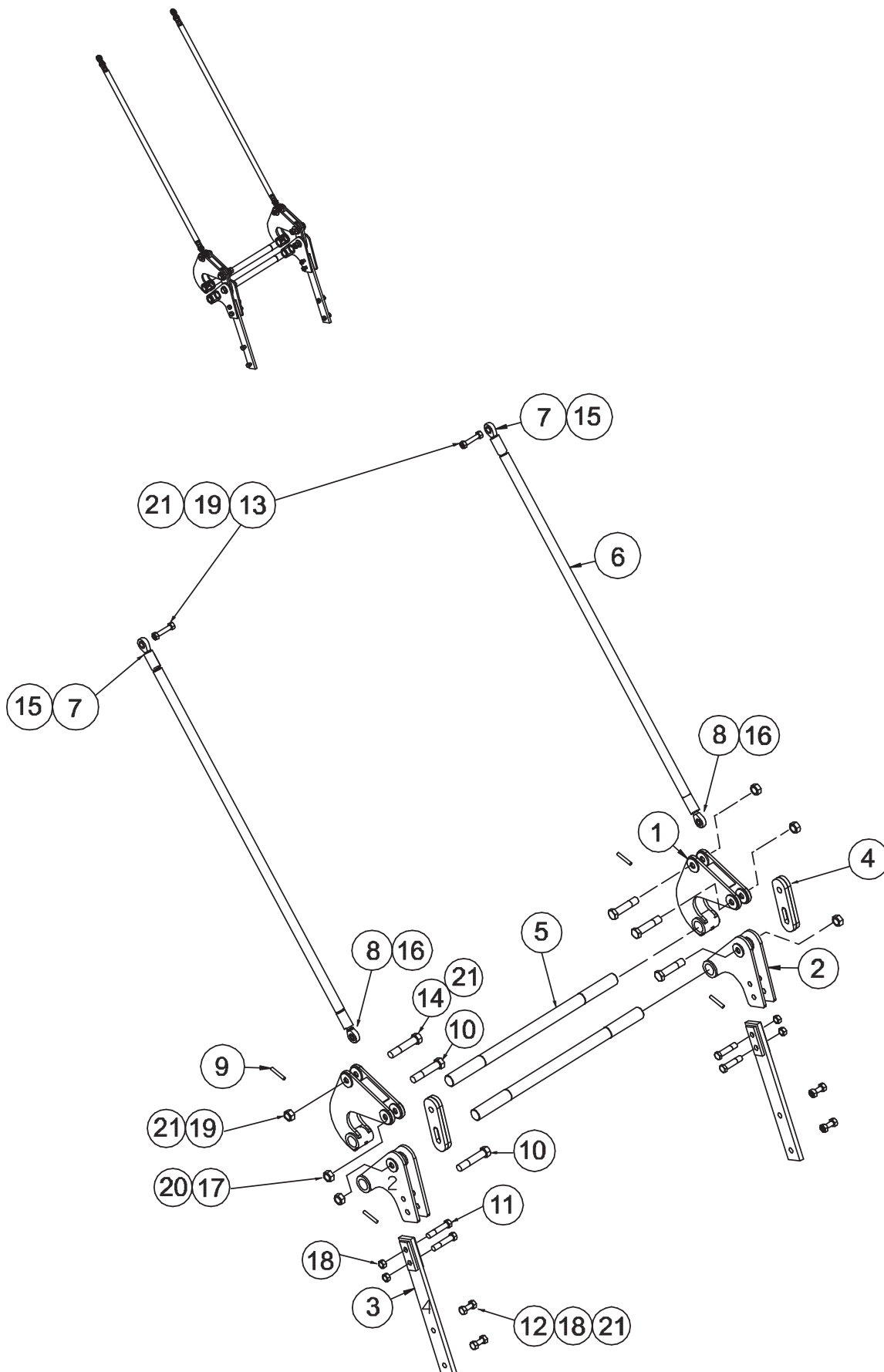
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-6 Pivot Assembly PS-35029A

See Parts List Page 20



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-6 Pivot Assembly

Parts List

See Drawing Page 19

Item	Part No.	Part Name	Qty		
1	PS-21042	CRANK-PRIMARY	2		
2	PS-21039	CRANK-SECONDARY	2		
3	PS-21040	CRANK-TIE BAR	2		
4	PS-21041	CRANK-LINKAGE-SLIDING	2		
5	PS-21039	PIN-PIVOT-PRIMARY	2		
6	PS-21595	ROD-LINKAGE-(2041mm)	2		
7	PS-29004	ROD END-LH	2		
8	PS-29003	ROD END-RH	2		
9	CPS-M10X80PR	ROLL PIN	4		
10	PS-M24X120ZP	BOLT- M24 x 120 10.9	4		
11	PS-M20X100ZP	BOLT- M20 x 100 10.9	4		
12	PS-M20X60ZP	BOLT- M20 x 60 10.9	4		
13	CPS-3/4"X5"UNF	BOLT- 3/4" x 5" Gr 8	2		
14	CPS-3/4"X4 1/2"UNF	BOLT- 3/4" x 4 1/2" Gr 8	2		
15	PS-29004-N	NUT- LOCKING-LH	2		
16	PS-29003-N	NUT- LOCKING-RH	2		
17	PS-M24NN	NUT- M24-NYLOC	4		
18	PS-M20NN	NUT- M20-NYLOC	8		
19	CPS-3/4" N/L UNF	NUT- NYLOC-3/4"	4		
20	PS-M24WH	WASHER-HARDENED-M24	8		
21	CPS-M20WH	WASHER-HARDENED-M20	24		

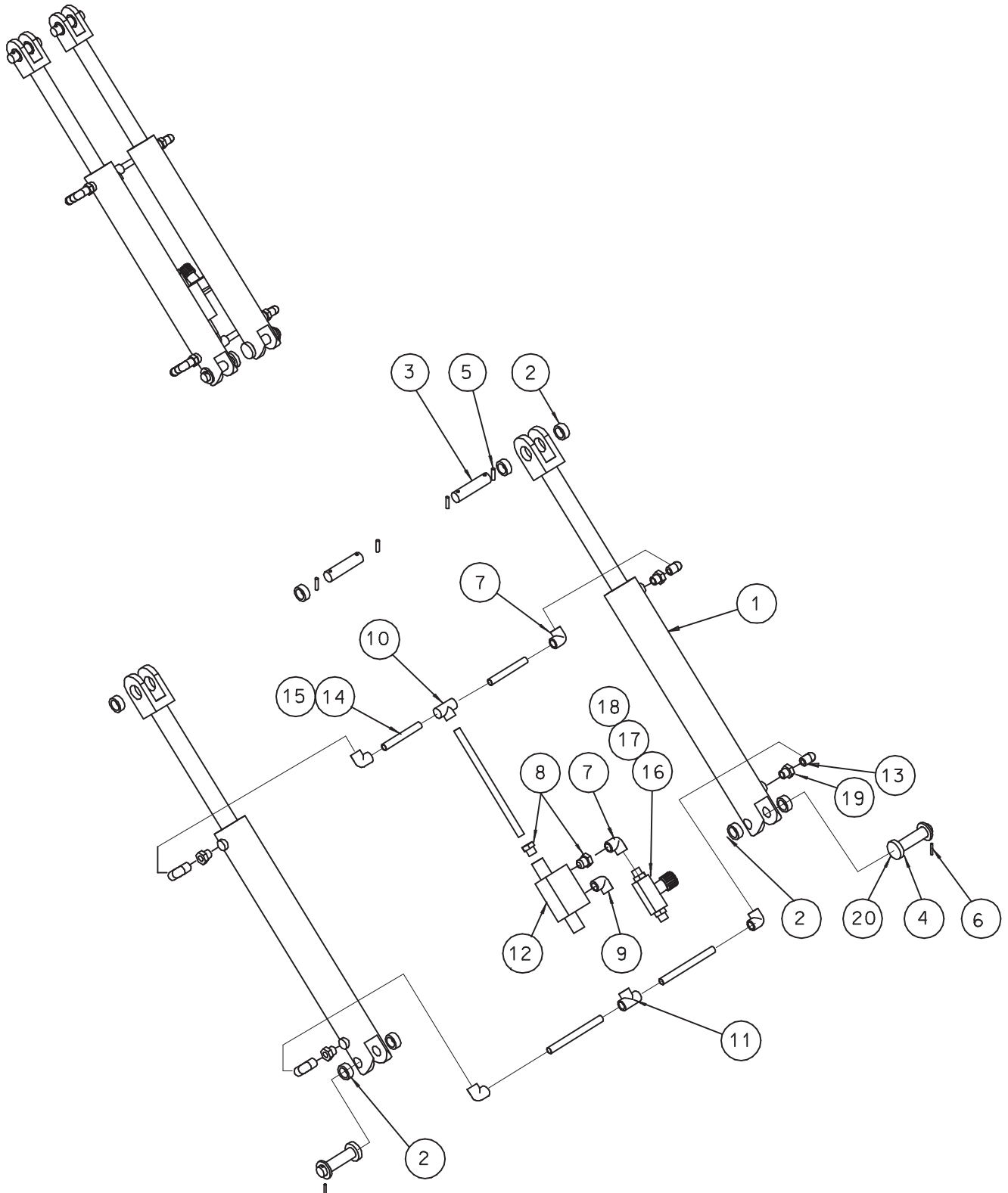
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-7 Hydraulic Cylinder Assembly

See Parts List Page 22



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-7 Hydraulic Cylinder Assembly

Parts List

See Drawing Page 21

CYLINDERS

Item	Part No.	Part Name	Qty		
1	PS-63009-A	HYD CYLINDER 2 1/2"	2		
2	PS-63009-C	CYLINDER-BUSH-CLEVIS	8		
3	PS-63009-TP	PIN-CYLINDER-TOP	2		
4	PS-63009-P	PIN-CYL-BOTTOM+WASHER	2		
5	CPS-M8x56ZP	SPLIT PIN - M8 - CLEVIS PIN-TOP	4		
6	CPS-M4x50ZP	SPLIT PIN - M4 - CLEVIS PIN-BOTTOM	2		
	PS-63103-N	SEAL KIT	1		

PLUMBING

Item	Part No.	Part Name	Qty		
	PS61160-KIT	HARD PLUMBING KIT	.		
7	PS-61159	FITTING-ELBOW- 9/16" JIC x 1/4" BSPP	5		
8	PS-61157	FITTING-O RING 1/4BSPP x 9/16" JIC	2		
9	PS-61154	FITTING-ELBOW-O RING 1/4BSPP x 9/16" JIC	1		
10	PS-61149	FITTING-TEE-9/16" JIC-M/M	1		
11	PS-61148	FITTING-TEE-9/16" JIC / 1/4" BSPP	1		
12	PS-63201	VALVE-PILOT OPERATED-LOCKING	1		
13	PS-61158-5MM	FITTING-0.5mm RESTRICTION 90 DEG.	4		
14	PS-61160	TUBES - 4off 110mm, 1 off 517mm	.		
15	PS-61147	FERRULES	10		
16	PS-63202	FLOW CONTROL VALVE	1		
17	PS-63202-B	FITTING-JIC NIPPLE	1		
18	PS-63202-C	FITTING-JIC SWIVEL	1		
19	PS-61163	FITTING-REDUCER-3/4" UNO-1/4" BSPP	4		
20	PS-61006-1	FITTING-GREASE NIPPLE-90	2		
21	PS-60051-2.8M	HOSE-HYDRAULIC	2		

The logo for Power Step, featuring the words "POWER" and "STEP" stacked vertically in a bold, sans-serif font. The text is flanked by a stylized graphic element consisting of two thick, dark lines that curve upwards and outwards, resembling a pair of wings or a stylized 'P' and 'S' joined together.

Valve Diagram



FOLDING RETRACTABLE STAIRWAY

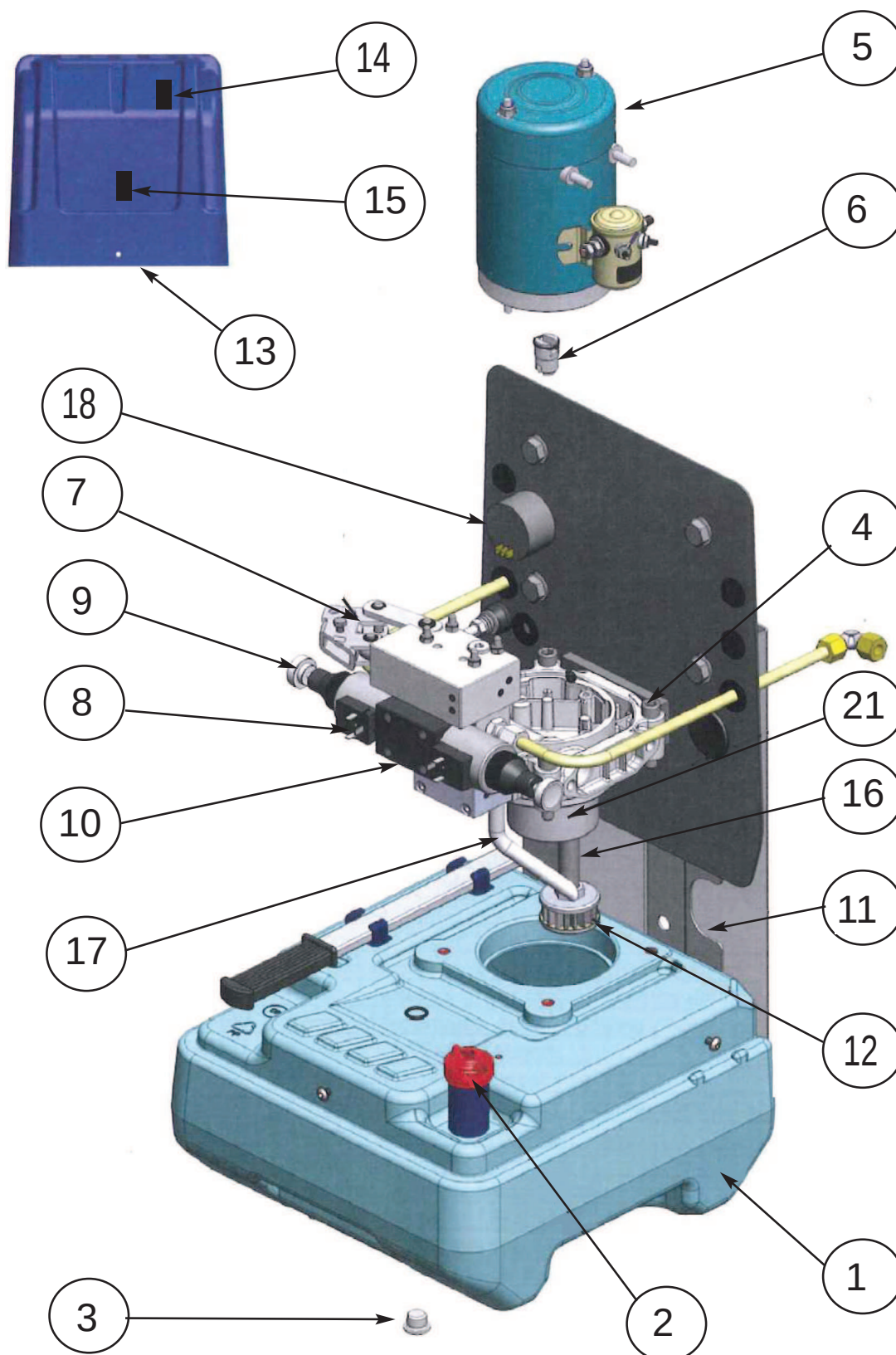
To suit Liebherr 994B FRS



Section 4-8 Power Pack Assembly

PS-80104P (Not including Cradle)

PS-80104P-FRS (Including Cradle)



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-8 Power Pack Assembly PS-80104P (Not including Cradle) PS-80104P-FRS (Including Cradle)

See Drawing Page 24



Item	Part No.	Part Name	Qty		
1	PS-514.9.154	PLASTIC TANK	1		
2	PS-509.5.140	TANK FILLER CAP	1		
3	PS-115.6.126	TANK PLUG	1		
4	PS-147.900.724	PUMP & HOUSING ASSEMBLY	1		
5	PS-149.165.89	24V MOTOR	1		
6	PS-114.4.951	DRIVE COUPLING	1		
7	PS-106.936.308	EMERGENCY HAND PUMP	1		
8	PS-131.2.28	A-B TO T (A2) VALVE	1		
9	PS-122.11.1258	MANUAL OVERRIDE BUTTON	1		
10	PS-149.115.123	BASE PANEL (MANIFOLD)	1		
11	PS-538.6.200	REAR BRACKET	1		
12	PS-118.64	PUMP FILTER	1		
13	PS-147.790.308	SINGLE VALVE COVER	1		
14	PS-122.11.1276	COVER SWITCH	1		
15	PS-149.990.991	COVER LIGHT	1		
16	PS-541.3.126	PUMP PICK UP TUBE	1		
17	PS-541.6.89	RELIEF TUBE	1		
18	PS-122.11.357	BUZZER	1		
19	PS-21613	MOUNTING CRADLE	1		
20	PS-149.120.820	MASTER SWITCH	1		
21	PS-506.4.254	O RING SEAL 5.34 x 101	1		

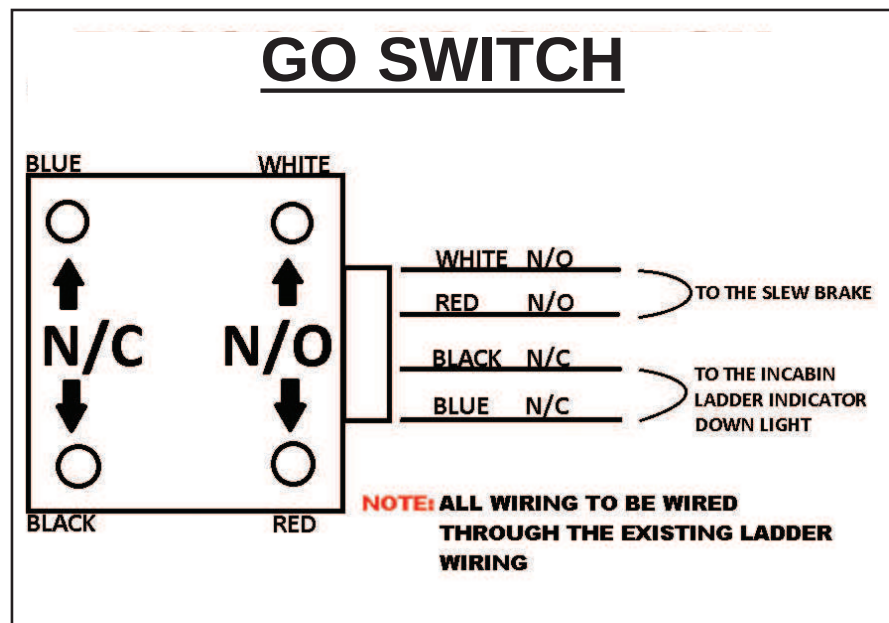
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-8 Power Pack Assembly

Single Valve Power Pack - Electrical



FOLDING RETRACTABLE STAIRWAY

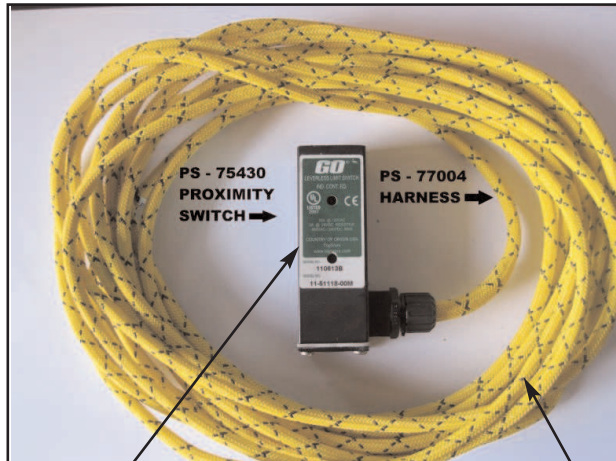
To suit Liebherr 994B FRS

Section 4-9 Electrical Controls



Proximity Switch Assembly

Mounted on Fixed Landing

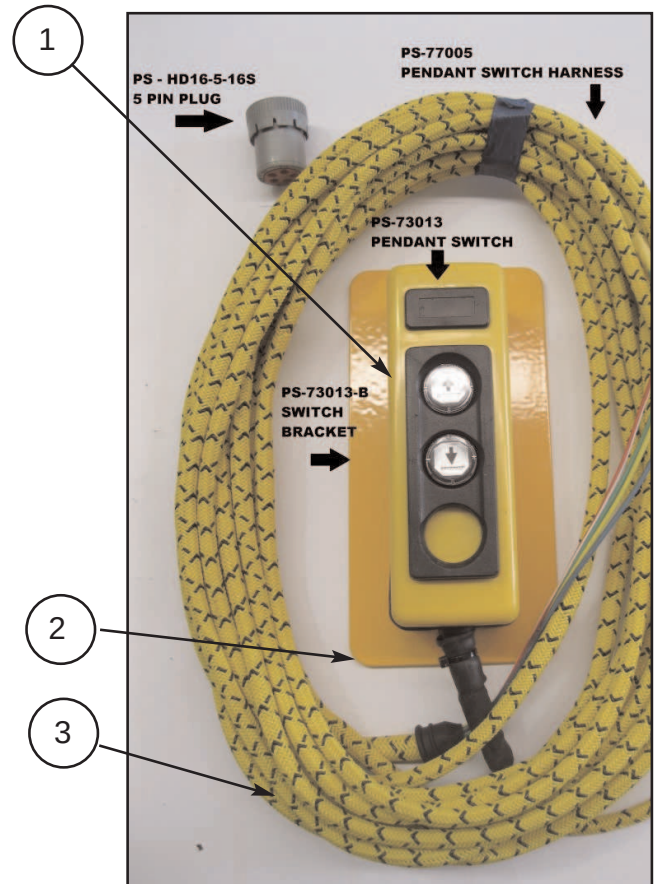


5

4

Control Pendant Switch

Mounted on Handrail



1

2

3

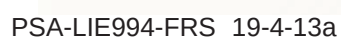
Item	Part No.	Part Name	Qty		
1	PS-73013	CONTROL PENDANT SWITCH	1		
2	PS-73013-B	CONTROL PENDANT BRACKET	1		
3	PS-77005	HAND RAIL SWITCH HARNESS	1		
4	PS-77004	CABIN TO SWITCH HARNESS	1		
5	PS-75430	PROXIMITY SWITCH	1		

WARNING

**LOW OR FAULTY BATTERIES WILL VOID
WARRANTY ON THE POWER PACK AND ALL
ELECTRICAL SWITCHES AND COMPONENTS**

The logo for Power Step, featuring the words "POWER" and "STEP" stacked vertically in a bold, sans-serif font. The text is flanked by a stylized graphic element consisting of two thick, dark lines that curve upwards and outwards, resembling a pair of wings or a stylized 'P' and 'S' joined together.

Wiring Diagram 1



FOLDING RETRACTABLE STAIRWAY

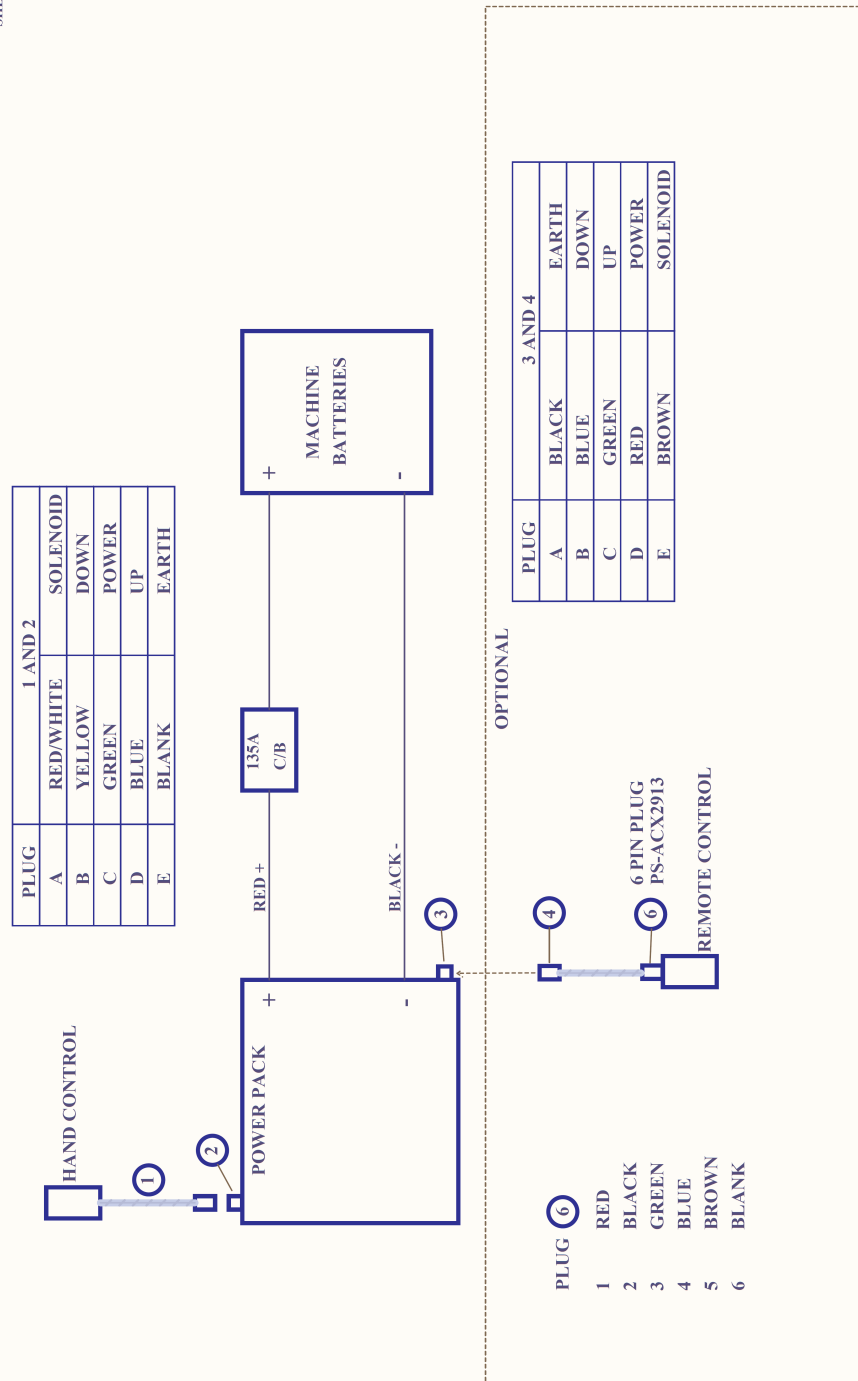
To suit Liebherr 994B FRS



Section 4-9 Electrical Controls

Wiring Diagram 2

0203-01
SHEET 3



POWER PACK WITH REMOTE CONTROL

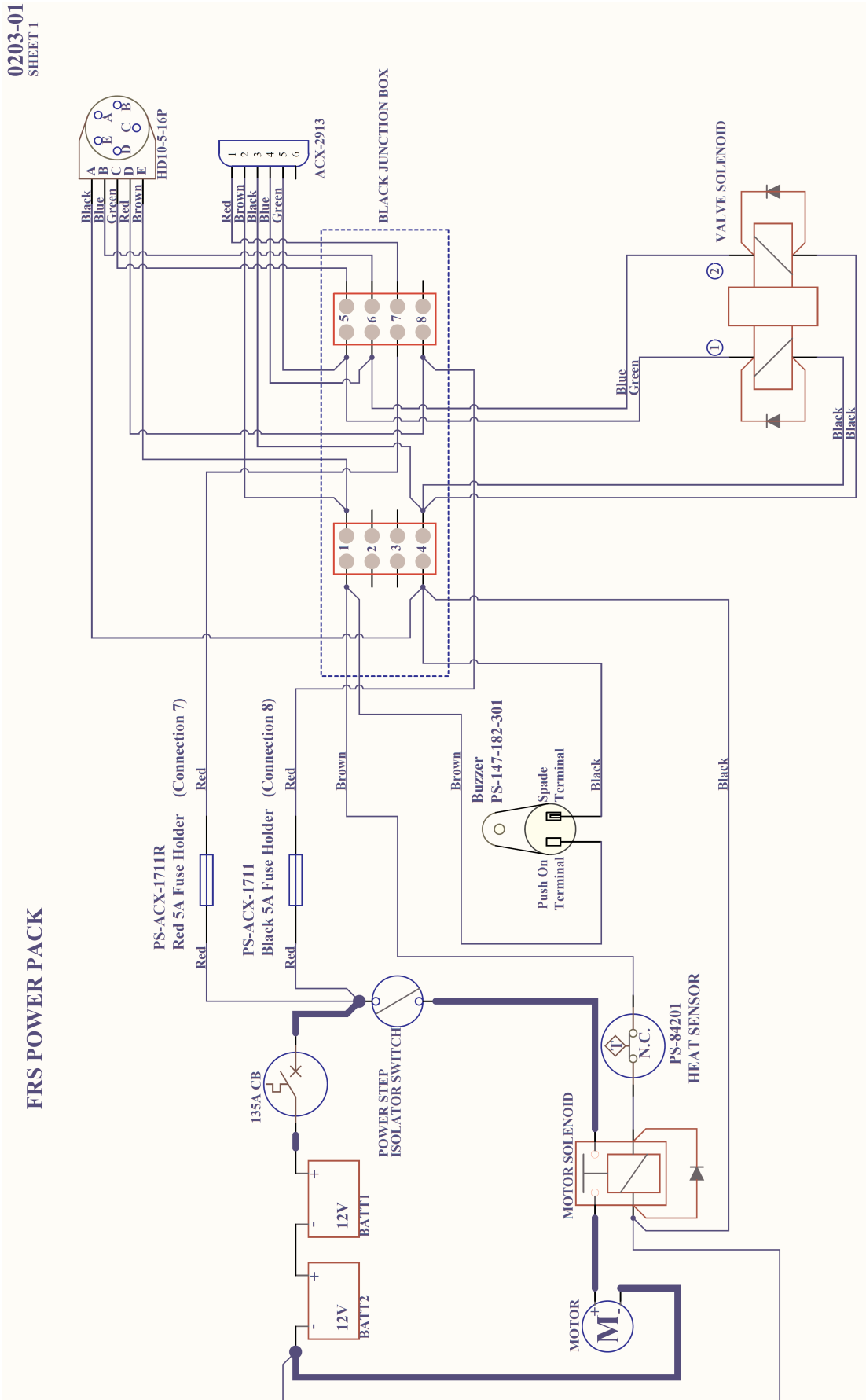
FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Section 4-9 Electrical Controls

Wiring Diagram 2



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



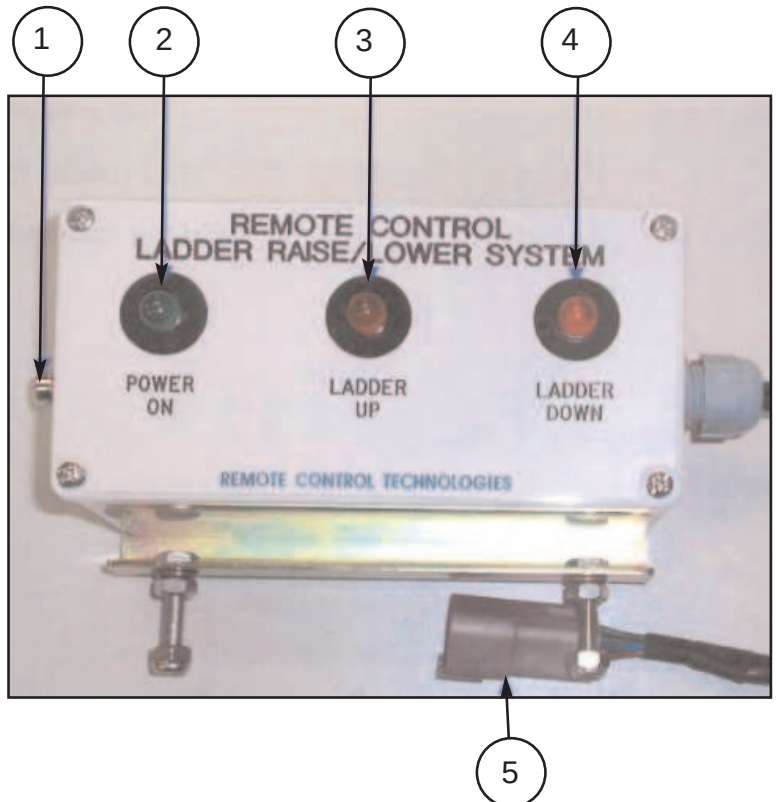
Section 4-9 Electrical Controls

OPTIONAL EXTRA ONLY

Raise/lower Transmitter
PS-2393

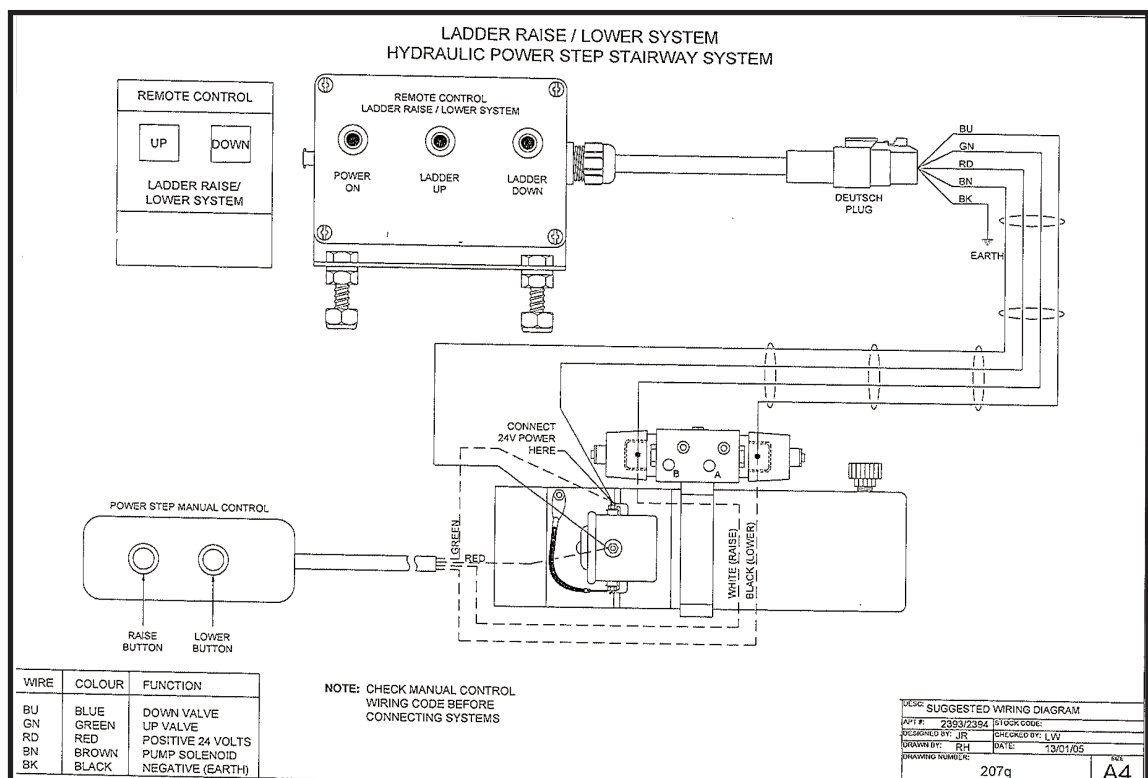


Remote Control Unit PS-2394



1. AERIAL BULKHEAD
2. POWER ON LED
3. LADDER UP LED
4. LADDER DOWN LED
5. POWER/LOGIC PLUG

SUGGESTED WIRING FOR HYDRAULIC POWERSTEP STAIRWAY SYSTEM



FOLDING RETRACTABLE STAIRWAY

To suit Liebherr 994B FRS



Emergency Lanyard Kit and Wiring Diagram

OPTIONAL EXTRA ONLY

PS-HITEX-L/YARD KIT



EMERGENCY LANYARD WIRING

