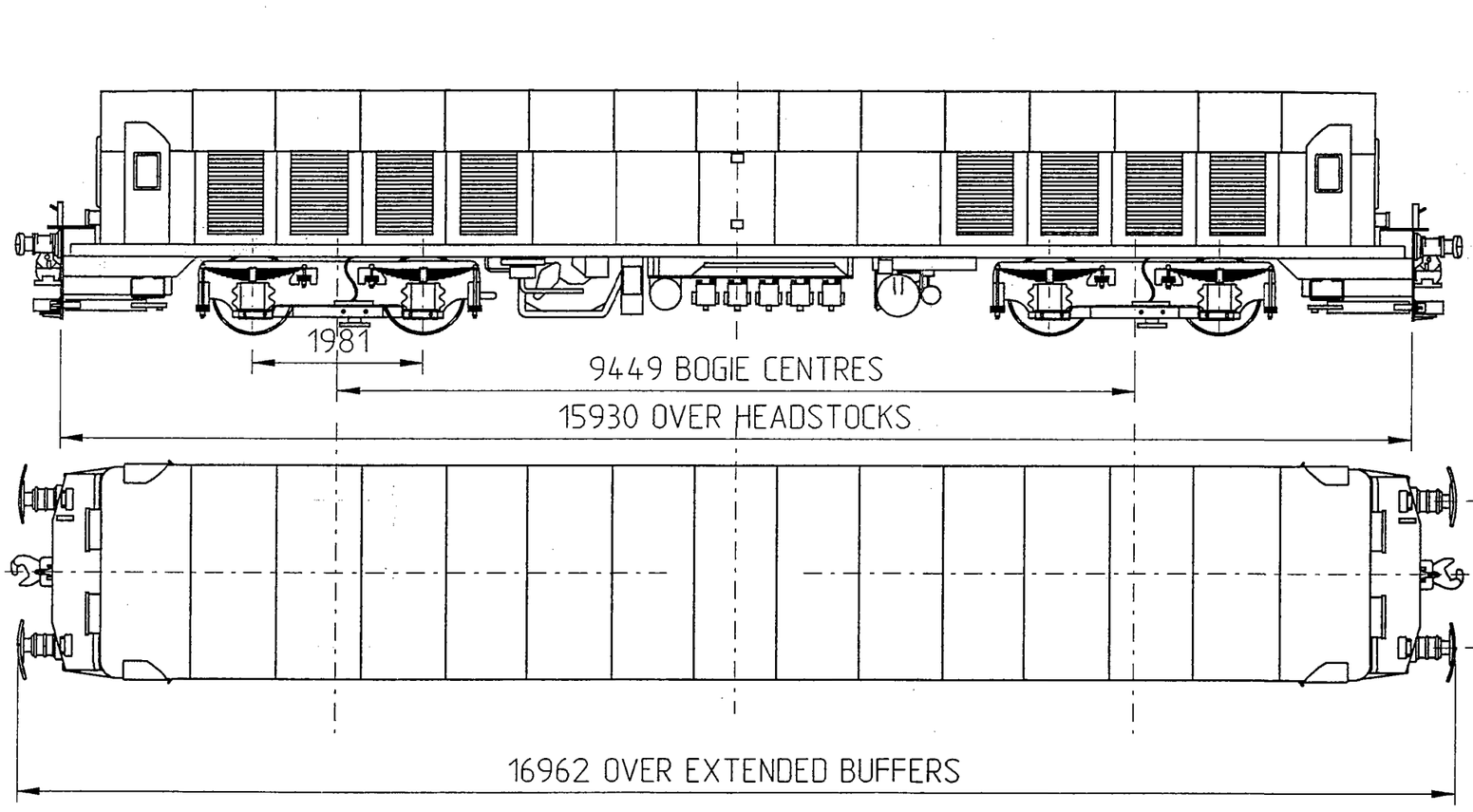
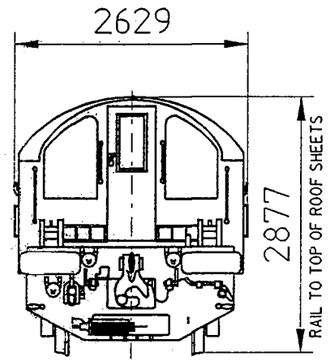
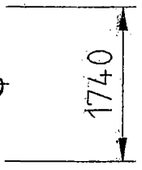
1969 BATTERY LOCOMOTIVE





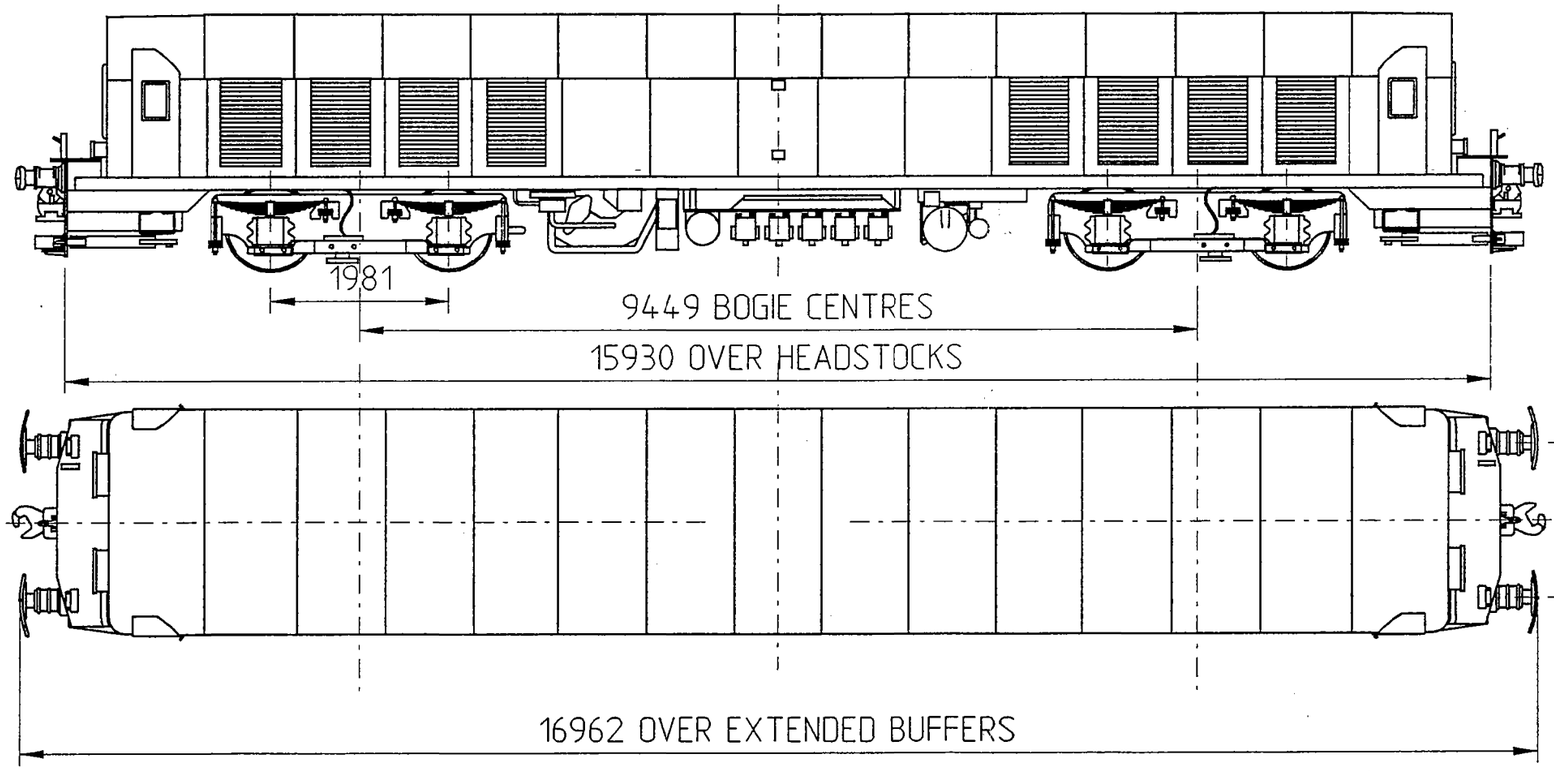


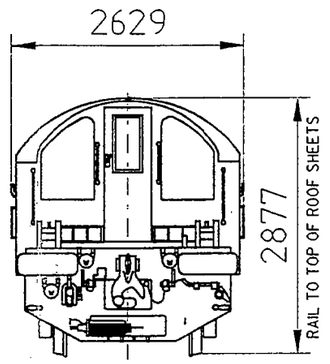
NO.RANGE: L15 - L19	23/11/93	LULI

1969 BATTERY LOCOMOTIVE

TITLE		BATTERY LOCOMOTIVE
FUNCTION		HAULING WAGONS
NUMBER RANGE		L 15 – L 19
DELIVERY DATE		1970
MANUFACTURERS NAME		METRO – CAMMELL LTD
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2010
MODIFICATION DETAILS		SEE APPENDIX
LENGTH IN TRAIN FORMATION – BUCKEYE – RCH		16930 mm APPROX 16780 mm APPROX
GROSS WEIGHT		62 TONNES APPROX
TRACTION BATTERY	TYPE	L15, L16, L18, L19 – XTLF39
		L17 HTLF39
	CAPACITY	L15, L16, L18, L19 – 1197TP
		L17 1026TP
BRAKING SYSTEM		AIR BRAKED TWO PIPE DAVIES AND METCALFE TWO COMPRESSORS
COUPLINGS	TYPE	BUCKEYE + RCH + EMERG. WEDGELOCK
	HEIGHT FROM RAIL	41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph)
AXLE BOX TYPE		PLAIN JOURNAL AXLE BOX OILED 5.505" Dia x 9"
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		ABILITY TO HAUL TRAINS OVER NON-ELECTRIFIED LINES
		EXTERNAL POWER SUPPLIES A) 320V DC 15A SOCKET ON CAB BACK FOR CEMENT MIXERS B) WHITE BOX (10 PIN SOCKET) CONTROL JUMPER FOR LWR TRAINS LIGHTS AND COMMUNICATIONS C) 320V DC 100A (3 PIN SOCKET) FOR WAGON MOUNTED COMPRESSORS AND CONCRETE BREAKER

1964 BATTERY LOCOMOTIVE



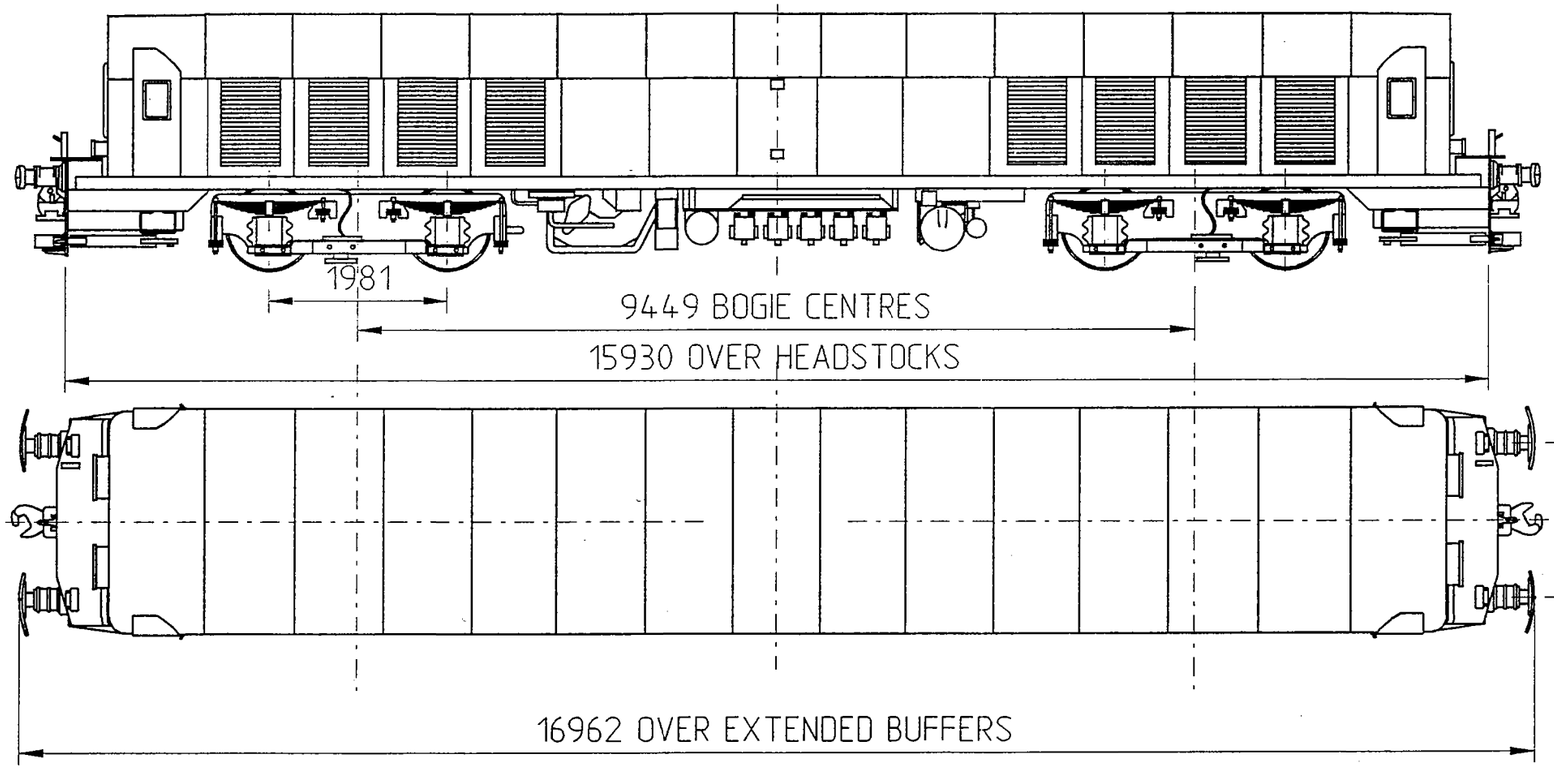


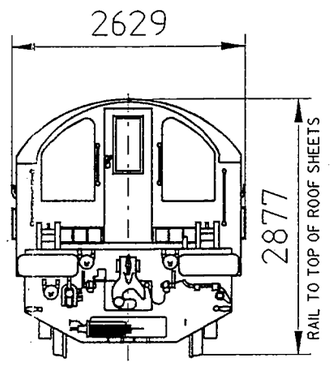
NO.RANGE: L20 - L32	23/11/93	LUL2

1964 BATTERY LOCOMOTIVE

TITLE		BATTERY LOCOMOTIVE
FUNCTION		HAULING WAGONS
NUMBER RANGE		L 20 – L 32
DELIVERY DATE MANUFACTURERS NAME		L 20 – L 21 1964 L 22 – L 32 1965 METRO CAMMELL LTD
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2005
MODIFICATION DETAILS		SEE APPENDIX
LENGTH IN TRAIN FORMATION – BUCKEYE – RCH		16930 mm APPROX 16780 mm APPROX
GROSS WEIGHT		62 TONNES APPROX
TRACTION BATTERY	TYPE	L20 – L25) L27 – L29) – XTLF39 L31 – L32) L26, L30 HTLF39
	CAPACITY	L20 – L25) L27 – L29) – 1197TP L31 – L32) L26, L30 1026TP
BRAKING SYSTEM		AIR BRAKED TWO PIPE DAVIES AND METCALFE TWO COMPRESSORS
COUPLINGS	TYPE	BUCKEYE + RCH + EMERG. WEDGELOCK
	HEIGHT FROM RAIL	41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 mph (48 kph)
AXLE BOX TYPE		PLAIN JOURNAL, AXLE BOX OILED 5.505" Dia x 9"
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		ABILITY TO HAUL TRAINS OVER NON-ELECTRIFIED LINES EXTERNAL POWER SUPPLIES A) 320V DC 15A SOCKET ON CAB BACK FOR CEMENT MIXERS B) WHITE BOX (10 PIN SOCKET) CONTROL JUMPER FOR LWR TRAINS LIGHTS AND COMMUNICATIONS C) 320V DC 100A (3 PIN SOCKET) FOR WAGON MOUNTED COMPRESSORS AND CONCRETE BREAKER

1973 BATTERY LOCOMOTIVE





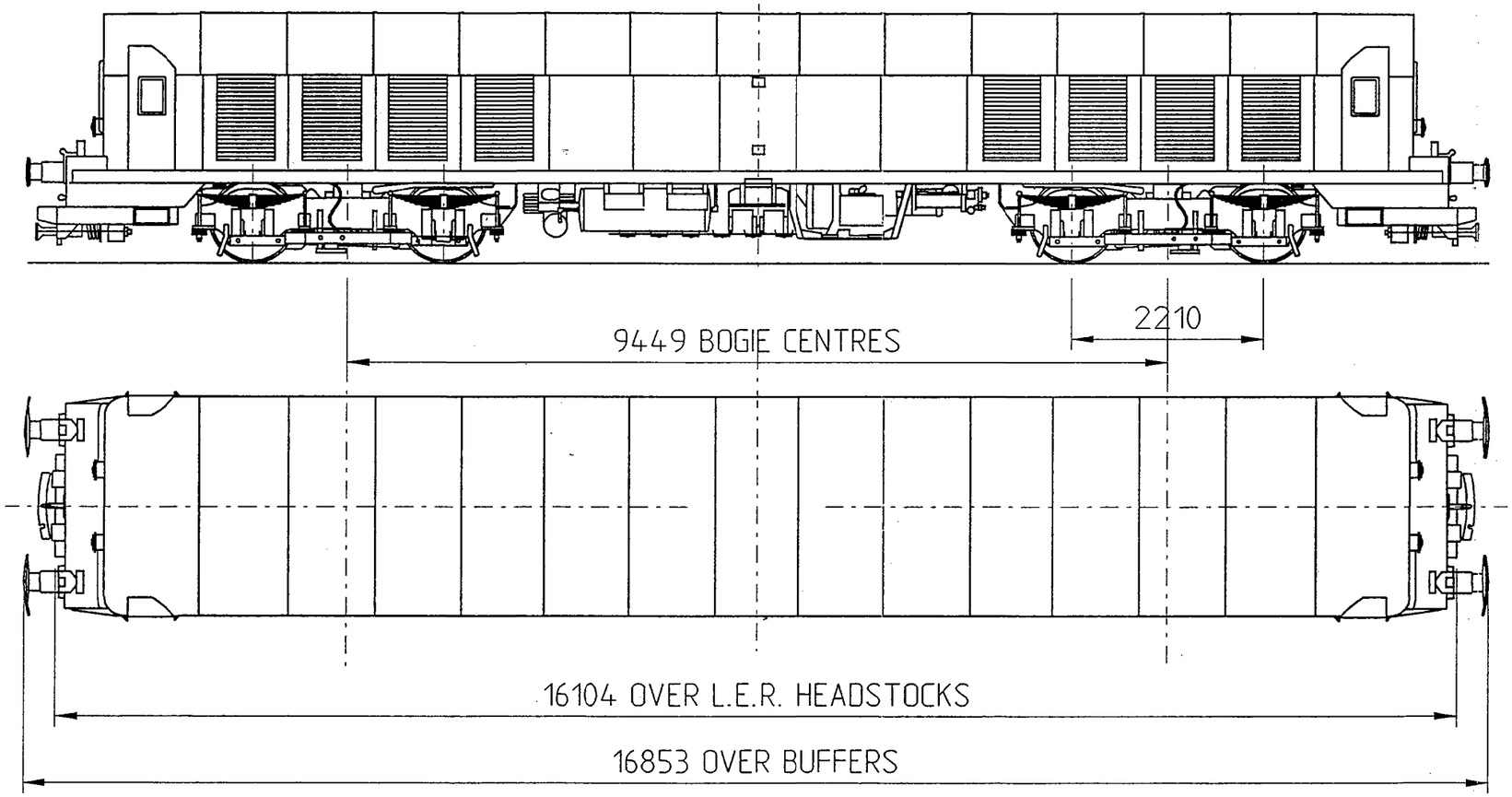
NO.RANGE: L44 - L54	23/11/93	LUL3

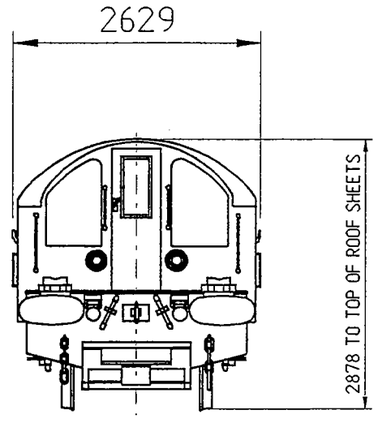
1973 BATTERY LOCOMOTIVE

TITLE		BATTERY LOCOMOTIVES
FUNCTION		HAULING WAGONS
NUMBER RANGE		L 44 – L 54
DELIVERY DATE – MANUFACTURERS NAME		1974 BREL DONCASTER
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2014
MODIFICATION DETAILS		SEE APPENDIX
LENGTH IN TRAIN FORMATION – BUCKEYE		16930 mm APPROX
	– RCH	16780 mm APPROX
GROSS WEIGHT		62 TONNES APPROX
TRACTION BATTERY	TYPE	L44, L46, L47, L52 – HTLF39
		L45, L48, L51, L54 – XTLF39
		L49, L50, L53 – ND39
	CAPACITY	L44, L46, L47, L52 – 1026TP
		L45, L48, L51, L54 – 1197TP
		L49, L50, L53 – 1027FP
BRAKING SYSTEM		AIR BRAKED TWO PIPE DAVIES AND METCALFE TWO COMPRESSORS
COUPLINGS	TYPE	BUCKEYE + RCH + EMERG. WEDGELOCK
	HEIGHT FROM RAIL	41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph)
AXLE BOX TYPE		ROLLER BEARING – TIMKEN SP 120
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		ABILITY TO HAUL TRAINS OVER NON-ELECTRIFIED LINES
		EXTERNAL POWER SUPPLIES A) 320V DC 15A SOCKET ON CAB BACK FOR CEMENT MIXERS B) WHITE BOX (10 PIN SOCKET) CONTROL JUMPER FOR LWR TRAINS LIGHTS AND COMMUNICATIONS C) 320V DC 100A (3 PIN SOCKET) FOR WAGON MOUNTED COMPRESSORS AND CONCRETE BREAKER

1948 BATTERY LOCOMOTIVE

BATTERY LOCO NO. L56 HAS RCH AND WARD COUPLERS ON A END AND RCH, BUCKEYE AND EMERGENCY WEDGELOCK COUPLERS ON D END.





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NO.RANGE: L56, L58, L59	23/11/93	LUL4

1948 BATTERY LOCOMOTIVE

TITLE		BATTERY LOCOMOTIVE
FUNCTION		HAULING WAGONS
NUMBER RANGE		L 56 – L 59
DELIVERY DATE – MANUFACTURERS NAME		1951 – PICKERING & CO LTD GLASGOW
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) – 1991
MODIFICATION DETAILS		SEE APPENDIX
LENGTH OVER HEADSTOCKS		16104 mm
IN TRAIN FORMATION – RCH		16954 mm APPROX
– WARD		16804 mm APPROX
GROSS WEIGHT		61 TONNES
TRACTION BATTERY	TYPE	XTLF39
	CAPACITY	1197TP
BRAKING SYSTEM		AIR BRAKED TWO PIPE SINGLE COMPRESSOR
COUPLINGS	TYPE	WARD COUPLING + RCH HOOK
	HEIGHT FROM RAIL	14"/355 mm 41.5"/1055 mm
		NOTE: L56 IS FITTED WITH THE FOLLOWING: A END – WARD + RCH D END – RCH + BUCKEYE + EMERGENCY WEDGELOCK
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph)
AXLE BOX TYPE		PLAIN JOURNAL AXLE BOX OILED 5.505" Dia x 9"
ROUTE AVAILABILITY		RESTRICTED ALL LINES. MUST NOT RUN AS SINGLE LOCOMOTIVES AS ONLY ONE COMPRESSOR FITTED
SPECIAL FEATURES		ABILITY TO HAUL TRAINS OVER NON–ELECTRIFIED LINES EXTERNAL POWER SUPPLIES A) 320 V DC, 15A SOCKET ON CAB BACK WALL FOR CEMENT MIXERS B) WHITE BOX (10 PIN SOCKET) CONTROL JUMPER FOR LWR TRAINS LIGHTS AND COMMUNICATIONS

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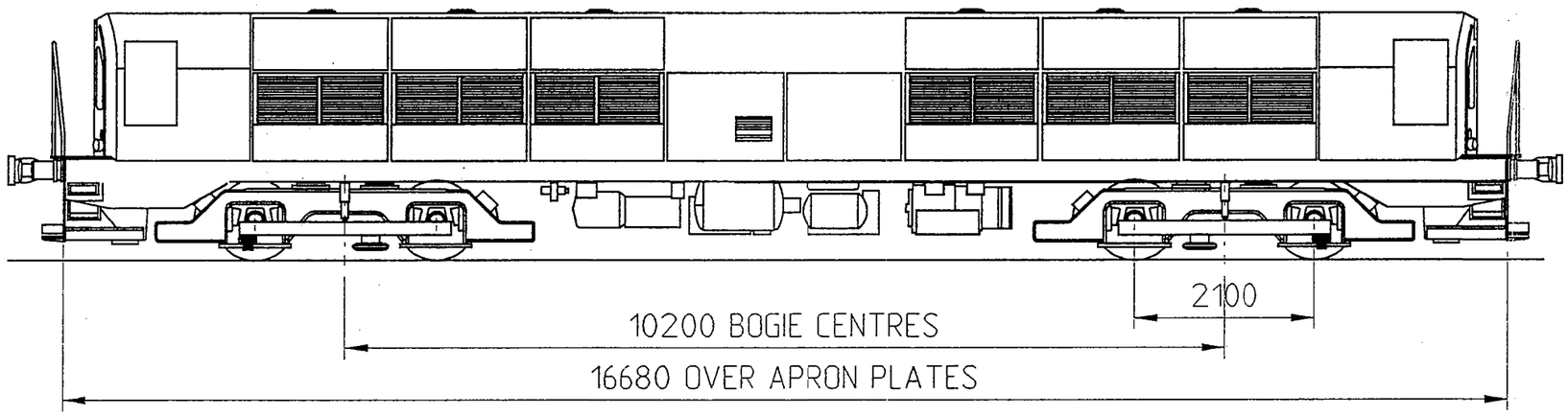
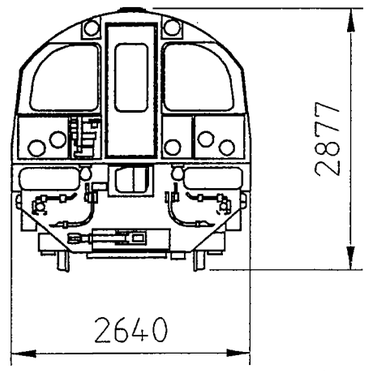
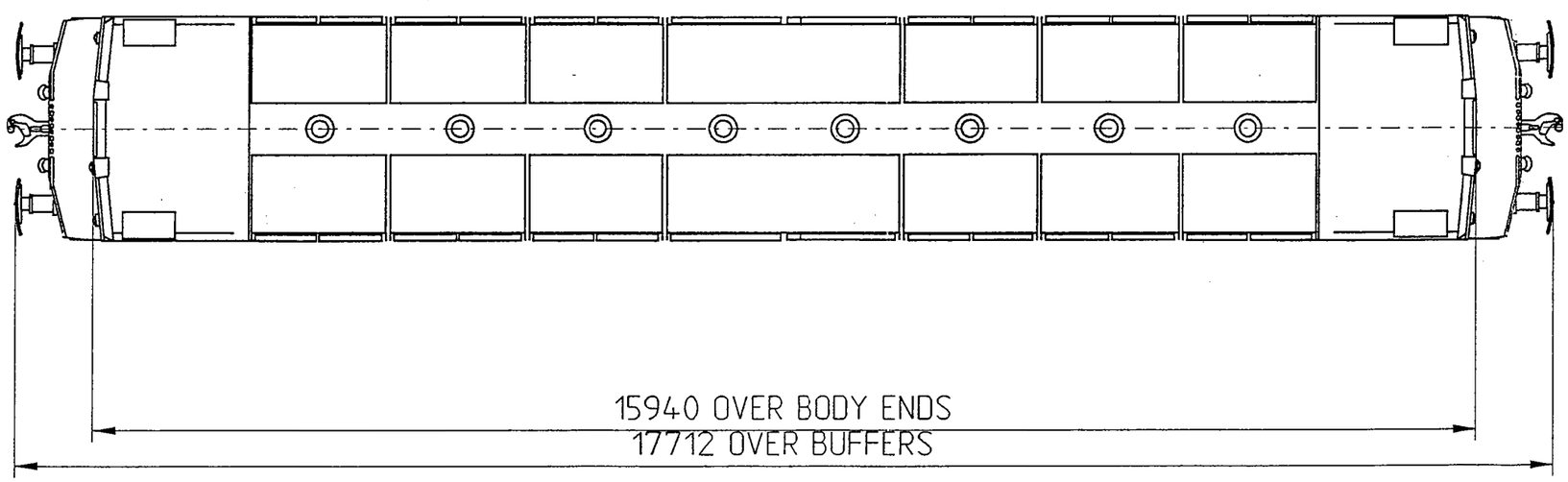
1985 BATTERY LOCOMOTIVE







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NO.RANGE: L62 - L67	23/11/93	LUL5

1985 BATTERY LOCOMOTIVE

TITLE		BATTERY LOCOMOTIVES
FUNCTION		HAULING WAGONS
NUMBER RANGE		L 62 – L 67
DELIVERY DATE – MANUFACTURERS NAME		1985 (L67 – 1986) METRO – CAMMELL
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2025
MODIFICATION DETAILS		SEE APPENDIX
LENGTH IN TRAIN FORMATION – BUCKEYE		17680 mm APPROX
	– RCH	17530 mm APPROX
GROSS WEIGHT		68 TONNES APPROX
TRACTION BATTERY	TYPE	WEF19DA
	CAPACITY	900TP
BRAKING SYSTEM		AIR BRAKED TWO PIPE DAVIES AND METCALFE TWO COMPRESSORS
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE + RCH + EMERG. WEDGELOCK 41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph)
AXLE BOX TYPE		ROLLER BEARING SKF TAPER
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		ABILITY TO HAUL TRAINS OVER NON ELECTRIFIED LINES
		FITTED WITH SLEET GEAR
		EXTERNAL POWER SUPPLIES
		6 SOCKETS AT EACH END IN OFFSIDE CABINET
		A) 320V DC 40A POWER –48V DC 10A CONTROL 48V DC 5A CAB–TO–CAB PHONE FOR RAIL TRAIN EQUIPMENT B) 320V DC 100A POWER –48V DC 10A CONTROL FOR LARGE POWER MACHINES C) 320V DC 15A POWER FOR RAIL CRANES D) 110V AC 3–PH 63A E) 110V AC 1–PH 16A F) 110V AC 1–PH 16A

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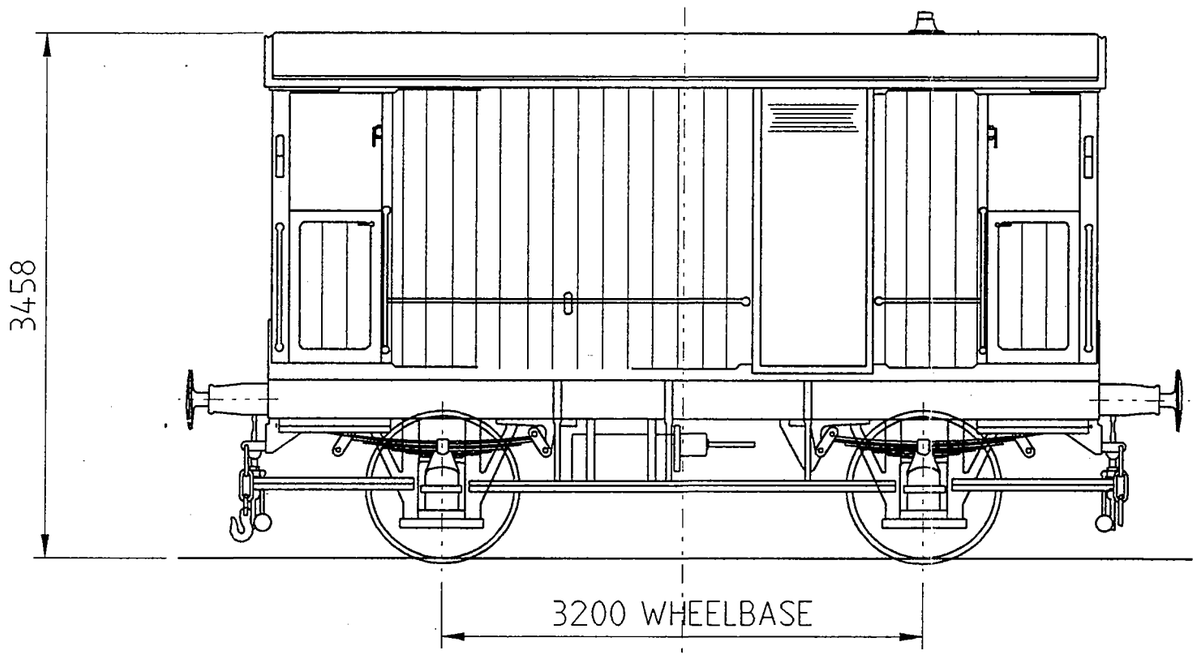
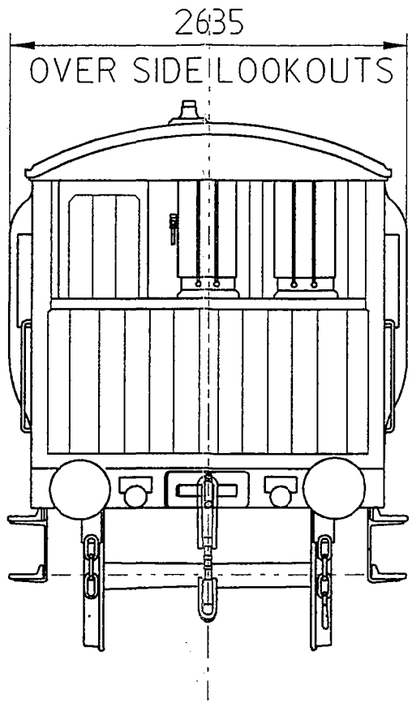
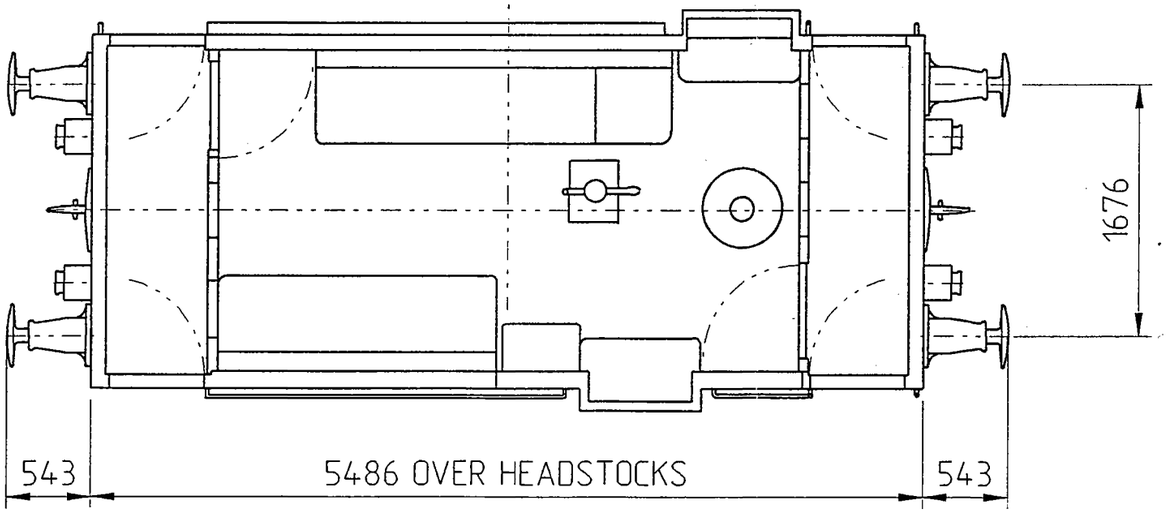
1935 20 TONNE BRAKE VAN







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NO.RANGE: BV558	23/11/93	LUL6a

BRAKE VANS

TITLE	BRAKE VANS
NUMBER RANGE	BV 558 – BV 585
DELIVERY DATE – MANUFACTURERS NAME	BV 558 1935 HURST–NELSON BV 580 – BV 585 1965 BR ASHFORD
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) BV 558 – 1975 BV 580–585 – 2005
MODIFICATION DETAILS	NONE RECORDED
GROSS WEIGHT	20 TONS
BRAKING SYSTEM	HANDBRAKE ONLY (BV558 – BRAKE TEST RIG, VARIOUS EQUIPMENT)
COUPLINGS	BV 580 RCH + WARD (TUBE) BV 583 RCH + WARD (SURFACE) BV 584 RCH + WARD (SURFACE) BV 585 RCH + WARD (TUBE)
SERVICE AND MAXIMUM SPEEDS PERMITTED	30 MPH (48 kph)
AXLE BOX TYPE	BV558, BV580, BV585 – OIL 9"x4 1/2" BV583 + BV584 – ROLLER BEARING TIMKEN 4 3/8"
ROUTE AVAILABILITY	OUT OF GAUGE – JUBILEE LINE – SOUTH OF FINCHLEY ROAD NORTHERN AND VICTORIA LINES – ALL SECTIONS PICCADILLY LINE – EAST OF BARONS COURT AND WEST OF BOSTON MANOR CENTRAL AND BAKERLOO LINES – ALL SECTIONS
SPECIAL FEATURES	BV558 – BRAKE TEST RIG, VARIOUS EQUIPMENT (MATCH WAGON FOR L12)

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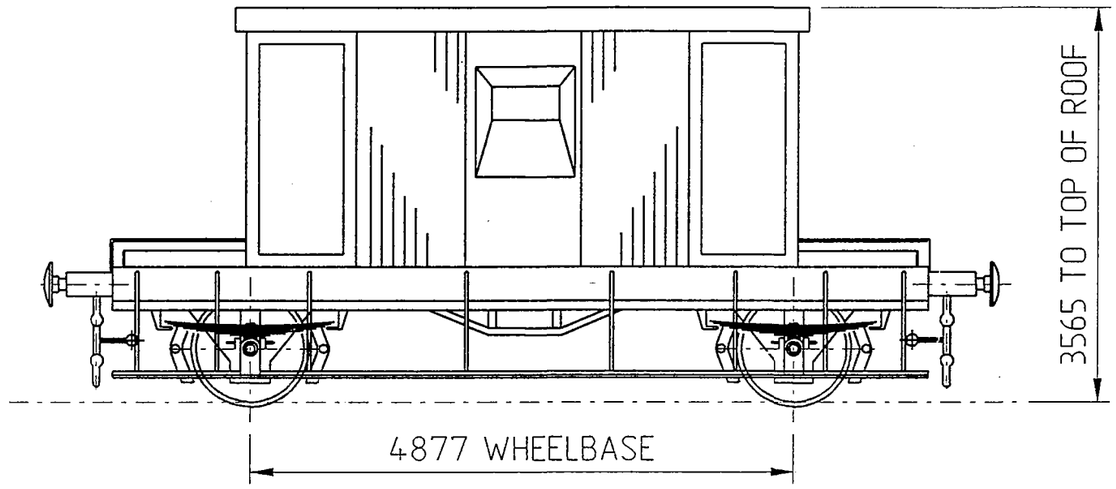
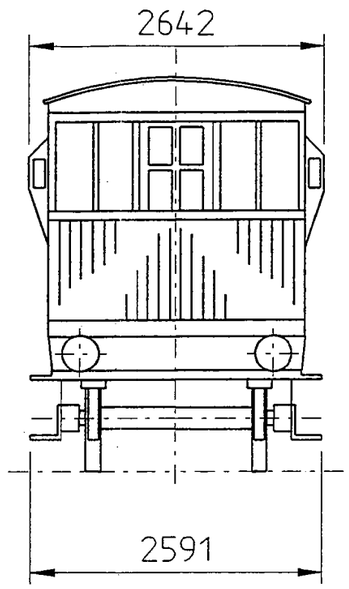
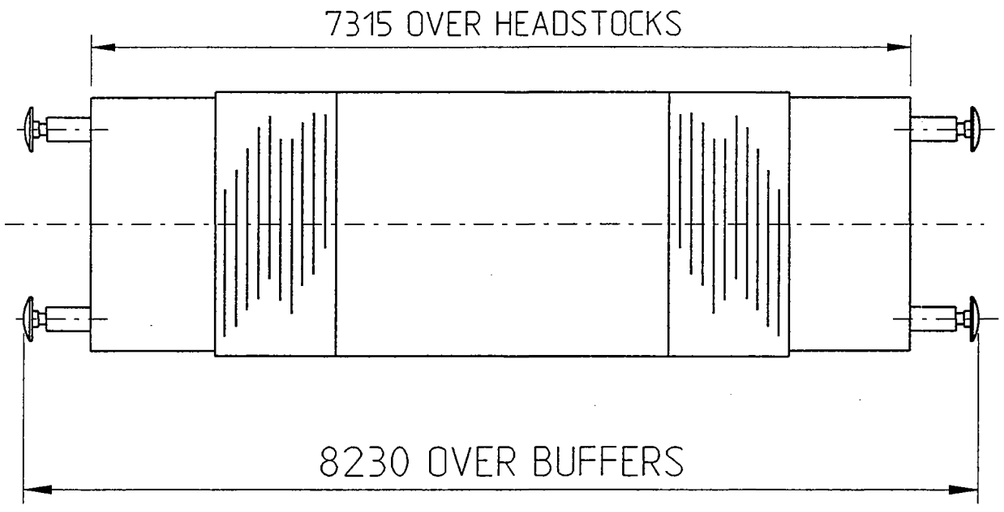
1965 20 TONNE BRAKE VAN







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NO.RANGE: BV580, BV583 - BV585	23/11/93	LUL6b

BRAKE VANS

TITLE	BRAKE VANS
NUMBER RANGE	BV 558 – BV 585
DELIVERY DATE – MANUFACTURERS NAME	BV 558 1935 HURST–NELSON BV 580 – BV 585 1965 BR ASHFORD
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) BV 558 – 1975 BV 580–585 – 2005
MODIFICATION DETAILS	NONE RECORDED
GROSS WEIGHT	20 TONS
BRAKING SYSTEM	HANDBRAKE ONLY (BV558 – BRAKE TEST RIG, VARIOUS EQUIPMENT)
COUPLINGS	BV 580 RCH + WARD (TUBE) BV 583 RCH + WARD (SURFACE) BV 584 RCH + WARD (SURFACE) BV 585 RCH + WARD (TUBE)
SERVICE AND MAXIMUM SPEEDS PERMITTED	30 MPH (48 kph)
AXLE BOX TYPE	BV558, BV580, BV585 – OIL 9"x4 1/2" BV583 + BV584 – ROLLER BEARING TIMKEN 4 3/8"
ROUTE AVAILABILITY	OUT OF GAUGE – JUBILEE LINE – SOUTH OF FINCHLEY ROAD NORTHERN AND VICTORIA LINES – ALL SECTIONS PICCADILLY LINE – EAST OF BARONS COURT AND WEST OF BOSTON MANOR CENTRAL AND BAKERLOO LINES – ALL SECTIONS
SPECIAL FEATURES	BV558 – BRAKE TEST RIG, VARIOUS EQUIPMENT (MATCH WAGON FOR L12)

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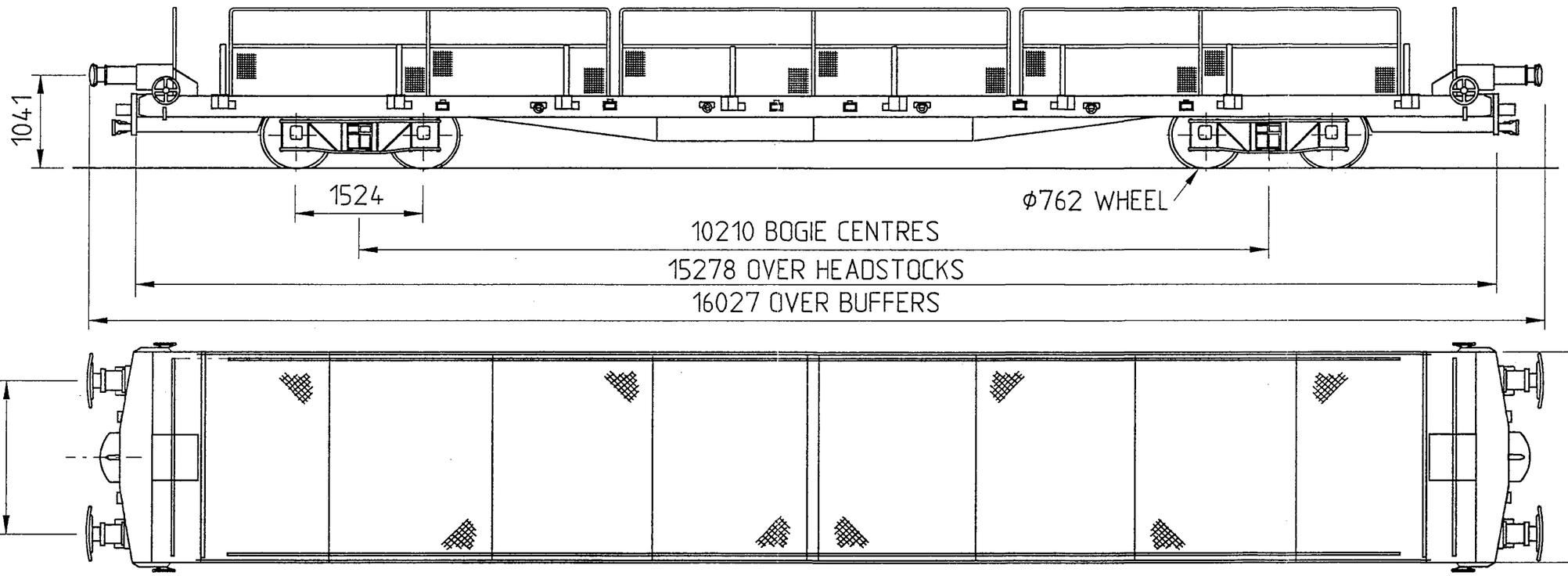
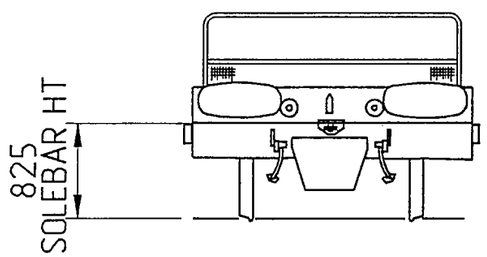
30 TONNE FLAT WAGON





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NO.RANGE: FW332, FW333	23/11/93	LUL7a

FLAT WAGONS

TITLE		FLAT WAGONS
FUNCTION		VARIOUS EQUIPMENT MATERIAL CARRYING
NUMBER RANGE		FW 332 – FW 394
DELIVERY DATE – MANUFACTURERS NAME		FW 332 – FW 340 GLOUCESTER 1937 FW 342 – FW 369 GLOUCESTER 1951 FW 385 – FW 394 BR ASHFORD 1965 FW 398 – BR ASHFORD 1966
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) FW 332 – FW 340 1987 FW 342 – FW 369 1991 FW 385 – FW 394 2005 FW 398 – 2006
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		18.35 TONNES
LOAD CAPACITY		30 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE SCREW PARKING BRAKE
COUPLINGS	TYPE	WARD OR BUCKEYE
	HEIGHT FROM RAIL	14"/355 mm OR 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		OIL 9 x $4^1/_2$" – FW333/335 HOFFMAN ROLLER – FW344/351/358/369 SKF ROLLER – ALL OTHERS
ROUTE AVAILABILITY		NO RESTRICTIONS

[redacted]

FLAT WAGONS (CONTINUED)

SPECIAL FEATURES

'D' IN TABLE INDICATES BUCKEYES

FW342/345 AND FW351/355 ARE
EX-CONCRETE MIXER MATCHED PAIRS
WITH EXTENDED WARD COUPLERS

FLEET NUMBER	VEHICLE DESCRIPTION	FUNCTION
~~FW 332~~	~~FUTURE POWER SUPPLIES (FPS)~~	~~PICKING UP MATERIAL~~
~~FW 333~~	~~FUTURE POWER SUPPLIES (FPS)~~	~~PICKING UP MATERIAL~~
~~FW 335~~	~~CABLE DRUM STAND WAGON (FPS)~~	~~REELING OFF CABLE~~
~~FW 336~~	~~CABLE DRUM STAND WAGON (FPS)~~	~~REELING OFF CABLE~~
~~FW 340~~	~~CONCRETE BREAKER WAGON~~	~~BREAKING CONCRETE~~
~~FW 342~~	~~IMPLEMENT WAGON H/STOCK A END~~	~~CARRYING EXCAVATORS~~
~~FW 344 D~~	~~GENERAL PURPOSE WAGON~~	~~CARRYING MATERIAL~~
~~FW 345~~	~~IMPLEMENT WAGON H/STOCK A END~~	~~CARRYING EXCAVATORS~~
FW 351	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
~~FW 352 (SCRAP)~~	~~IMPLEMENT WAGON H/STOCK A END~~	~~CARRYING EXCAVATORS~~
~~FW 353 D~~	~~TURN-TABLE WAGON 2 DRUM TYPE~~	~~REELING OFF CABLE~~
FW 355	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
~~FW 357 D~~	~~WATER TANK WAGON~~	~~WATER SPRAYING~~
~~FW 359 D~~	~~TURN-TABLE WAGON 4 DRUM TYPE~~	~~REELING OFF CABLE~~
~~FW 364 D~~	~~TURN-TABLE WAGON 4 DRUM TYPE~~	~~REELING OFF CABLE~~
~~FW 366 D~~	~~TURN-TABLE WAGON 6 DRUM TYPE~~	~~REELING OFF CABLE~~
~~FW 369 D~~	~~GENERAL PURPOSE WAGON~~	~~CARRYING MATERIAL~~
~~FW 385 D~~	~~TURN-TABLE WAGON 4 DRUM TYPE~~	~~REELING OFF CABLE~~
~~FW 386 D~~	~~TURN-TABLE WAGON 4 DRUM TYPE~~	~~REELING OFF CABLE~~
~~FW 394 D~~	~~TURN-TABLE WAGON 2 DRUM TYPE~~	~~REELING OFF CABLE~~
FW 398	FLAT WAGON (MATCH WAGON FOR FW 340)	CARRYING MATERIALS

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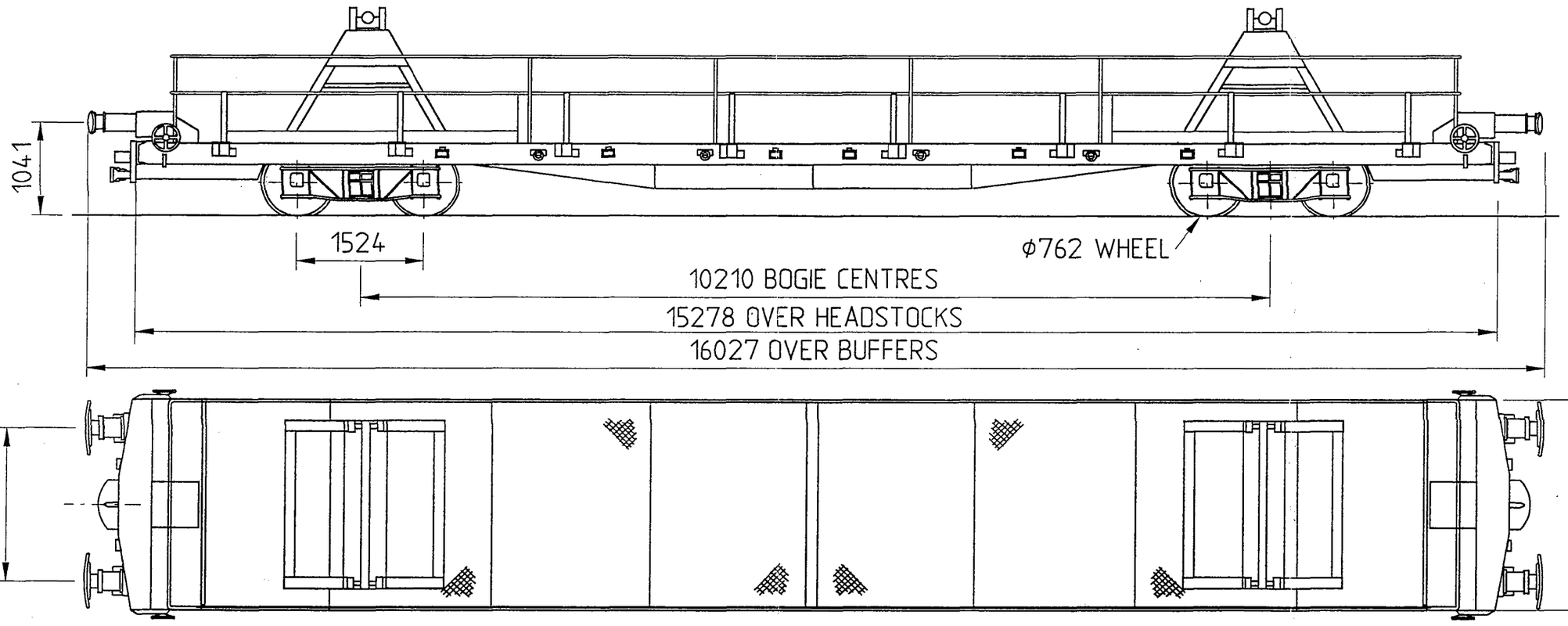
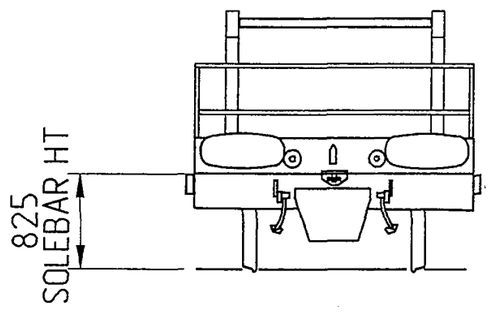
30 TONNE FLAT WAGON





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NO.RANGE: FW335, FW336	23/11/93	LUL7b

FLAT WAGONS

TITLE	FLAT WAGONS
FUNCTION	VARIOUS EQUIPMENT MATERIAL CARRYING
NUMBER RANGE	FW 332 – FW 394
DELIVERY DATE – MANUFACTURERS NAME	FW 332 – FW 340 GLOUCESTER 1937 FW 342 – FW 369 GLOUCESTER 1951 FW 385 – FW 394 BR ASHFORD 1965 FW 398 – BR ASHFORD 1966
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) FW 332 – FW 340 1987 FW 342 – FW 369 1991 FW 385 – FW 394 2005 FW 398 – 2006
MODIFICATION DETAILS	SEE APPENDIX
TARE WEIGHT	18.35 TONNES
LOAD CAPACITY	30 TONNES
BRAKING SYSTEM	AIR BRAKED WESTINGHOUSE SCREW PARKING BRAKE
COUPLINGS TYPE HEIGHT FROM RAIL	WARD OR BUCKEYE 14"/355 mm OR 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED	30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE	OIL 9 x $4^1/_2$" – FW333/335 HOFFMAN ROLLER – FW344/351/358/369 SKF ROLLER – ALL OTHERS
ROUTE AVAILABILITY	NO RESTRICTIONS

[redacted]

FLAT WAGONS (CONTINUED)

SPECIAL FEATURES

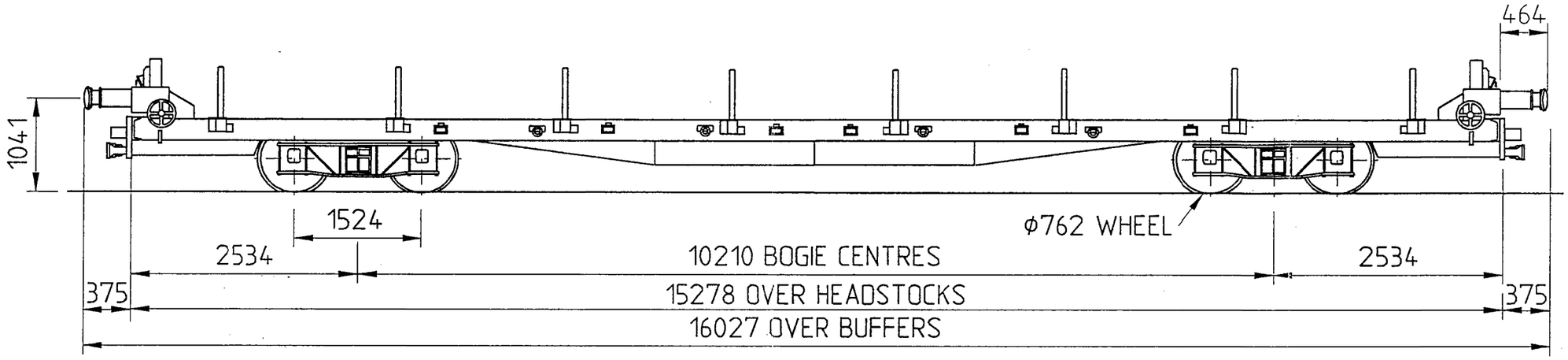
'D' IN TABLE INDICATES BUCKEYES

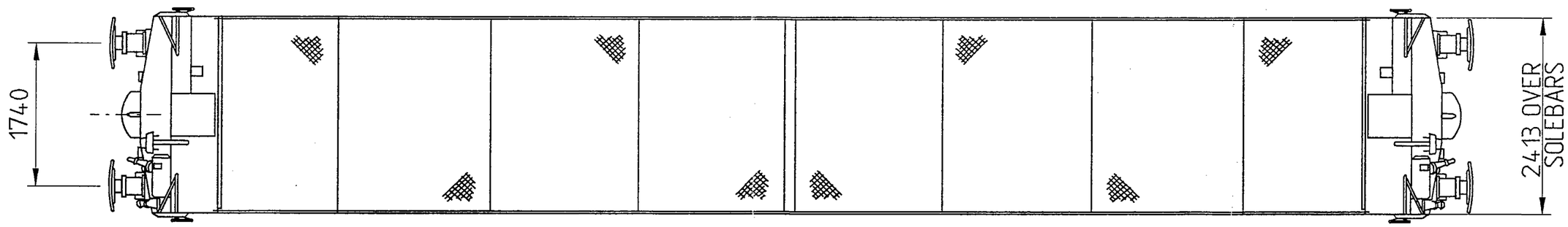
FW342/345 AND FW351/355 ARE
EX–CONCRETE MIXER MATCHED PAIRS
WITH EXTENDED WARD COUPLERS

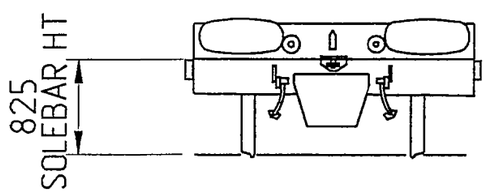
FLEET NUMBER	VEHICLE DESCRIPTION	FUNCTION
FW 332	FUTURE POWER SUPPLIES (FPS)	PICKING UP MATERIAL
FW 333	FUTURE POWER SUPPLIES (FPS)	PICKING UP MATERIAL
FW 335	CABLE DRUM STAND WAGON (FPS)	REELING OFF CABLE
FW 336	CABLE DRUM STAND WAGON (FPS)	REELING OFF CABLE
FW 340	CONCRETE BREAKER WAGON	BREAKING CONCRETE
FW 342	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 344 D	GENERAL PURPOSE WAGON	CARRYING MATERIAL
FW 345	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 351	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 352 (SCRAP)	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 353 D	TURN–TABLE WAGON 2 DRUM TYPE	REELING OFF CABLE
FW 355	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 357 D	WATER TANK WAGON	WATER SPRAYING
FW 358 D	TURN–TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 364 D	TURN–TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 366 D	TURN–TABLE WAGON 6 DRUM TYPE	REELING OFF CABLE
FW 369 D	GENERAL PURPOSE WAGON	CARRYING MATERIAL
FW 385 D	TURN–TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 386 D	TURN–TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 394 D	TURN–TABLE WAGON 2 DRUM TYPE	REELING OFF CABLE
FW 398	FLAT WAGON (MATCH WAGON FOR FW 340)	CARRYING MATERIALS

[redacted]

30 TONNE FLAT WAGON







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NO. RANGE: FW342 - FW394	23/11/93	LUL7c

FLAT WAGONS

TITLE		FLAT WAGONS
FUNCTION		VARIOUS EQUIPMENT MATERIAL CARRYING
NUMBER RANGE		FW 332 – FW 394
DELIVERY DATE – MANUFACTURERS NAME		FW 332 – FW 340 GLOUCESTER 1937 FW 342 – FW 369 GLOUCESTER 1951 FW 385 – FW 394 BR ASHFORD 1965 FW 398 – BR ASHFORD 1966
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) FW 332 – FW 340 1987 FW 342 – FW 369 1991 FW 385 – FW 394 2005 FW 398 – 2006
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		18.35 TONNES
LOAD CAPACITY		30 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD OR BUCKEYE 14"/355 mm OR 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		OIL 9 x 4 1/2" – FW333/335 HOFFMAN ROLLER – FW344/351/358/369 SKF ROLLER – ALL OTHERS
ROUTE AVAILABILITY		NO RESTRICTIONS

[redacted]

FLAT WAGONS (CONTINUED)

SPECIAL FEATURES

'D' IN TABLE INDICATES BUCKEYES

FW342/345 AND FW351/355 ARE EX-CONCRETE MIXER MATCHED PAIRS WITH EXTENDED WARD COUPLERS

FLEET NUMBER	VEHICLE DESCRIPTION	FUNCTION
FW 332	FUTURE POWER SUPPLIES (FPS)	PICKING UP MATERIAL
FW 333	FUTURE POWER SUPPLIES (FPS)	PICKING UP MATERIAL
FW 335	CABLE DRUM STAND WAGON (FPS)	REELING OFF CABLE
FW 336	CABLE DRUM STAND WAGON (FPS)	REELING OFF CABLE
FW 340	CONCRETE BREAKER WAGON	BREAKING CONCRETE
FW 342	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 344 D	GENERAL PURPOSE WAGON	CARRYING MATERIAL
FW 345	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 351	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 352 (SCRAP)	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 353 D	TURN-TABLE WAGON 2 DRUM TYPE	REELING OFF CABLE
FW 355	IMPLEMENT WAGON H/STOCK A END	CARRYING EXCAVATORS
FW 357 D	WATER TANK WAGON	WATER SPRAYING
FW 358 D	TURN-TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 364 D	TURN-TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 366 D	TURN-TABLE WAGON 6 DRUM TYPE	REELING OFF CABLE
FW 369 D	GENERAL PURPOSE WAGON	CARRYING MATERIAL
FW 385 D	TURN-TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 386 D	TURN-TABLE WAGON 4 DRUM TYPE	REELING OFF CABLE
FW 394 D	TURN-TABLE WAGON 2 DRUM TYPE	REELING OFF CABLE
FW 398	FLAT WAGON (MATCH WAGON FOR FW 340)	CARRYING MATERIALS

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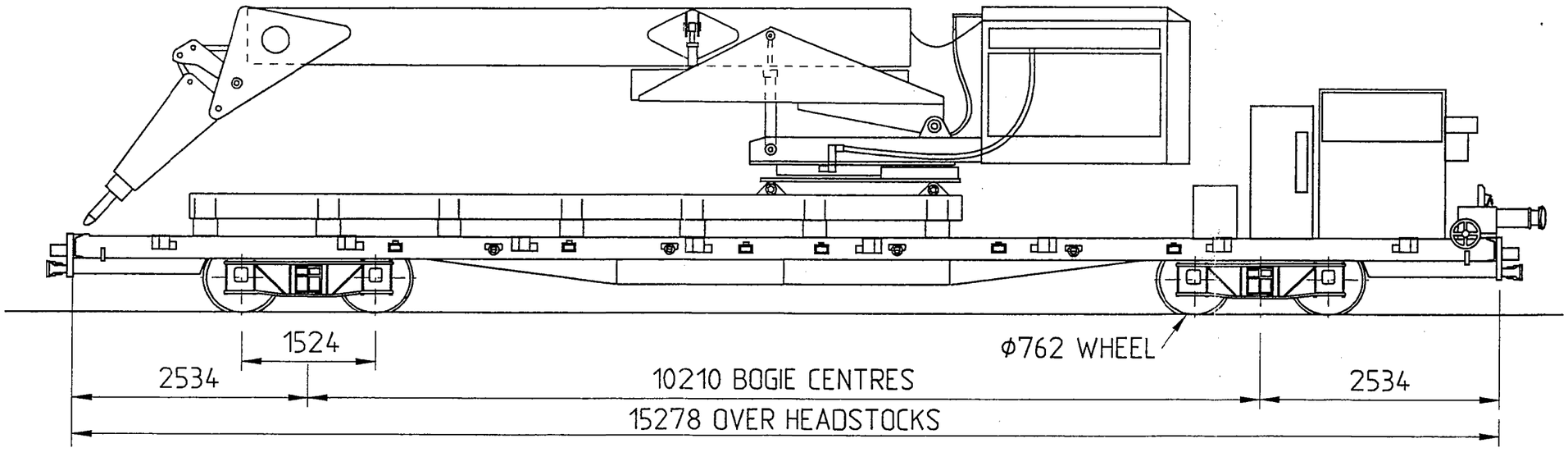
CONCRETE BREAKER WAGON



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NO.RANGE: FW340	23/11/93	LUL7d

CONCRETE BREAKER/MATCH WAGON

TITLE	CONCRETE BREAKING HAMMER
FUNCTION	TO BREAK THE CONCRETE SLEEPER RETAINING BEDS TUBE AND SUB-SURFACE RUNNING TUNNELS AS PART OF TUNNEL TRACK RECONDITIONING WORK
OPERATION DESCRIPTION	THE CONCRETE BREAKING HAMMER IS MOUNTED ON A 30 TON FLAT WAGON (WAGON Nº FW340). THE CONCRETE BREAKING UNIT IS A 'MONTABERT' BRH125 HYDRAULIC ROCK BREAKER. THE UNIT IS MOUNTED AT THE END OF AN APPROXIMATELY 6 METRE LONG MOUNTING BEAM. THE MOUNTING BEAM IS SUPPORTED BY A CARRIAGEWAY WHICH IN TURN IS FIXED TO THE WAGON DECK. THE CONCRETE BREAKING HAMMER WILL ONLY BREAK CONCRETE BEYOND ONE END OF THE WAGON ON WHICH IT IS MOUNTED; THE HEADSTOCK OF WHICH HAS BEEN REMOVED POWERED BY 'MAUDSLEY' 25HP 320V DC ELECTRIC MOTOR PRIMARY POWER SOURCE: BATTERY LOCOMOTIVE THE CONCRETE BREAKER'S WAGON IS ALWAYS COUPLED TO FLAT WAGON Nº FW398 AT THE CONCRETE BREAKING UNIT END OF THE WAGON, FOR TRAVEL ON THE RAILWAY THE OUTER ENDS OF FW340 AND FW398 ARE FITTED WITH 'WARD' COUPLERS
DELIVERY DATE – MANUFACTURERS NAME	MANUFACTURED 1981 RICHARD SMALLEY ENGINEERING LTD
DESIGN LIFE EXPIRES	(TAKEN AT 20 YEARS) 2001
MODIFICATION DETAILS	SEE APPENDIX FOR FLAT WAGONS ALSO MODIFIED FRONT WHEEL BOGIE SUSPENSION BLOCK

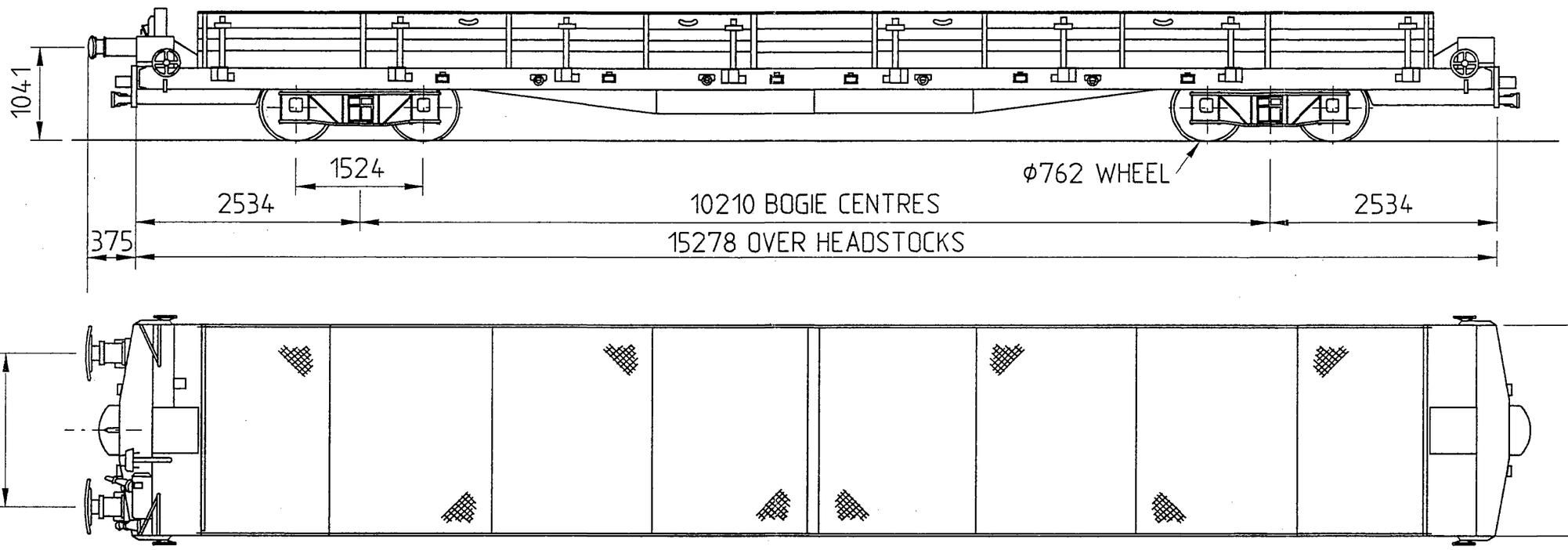
[redacted]

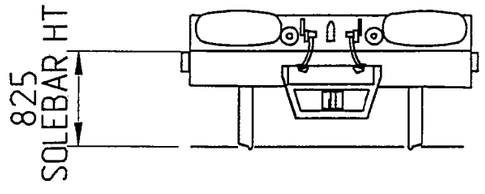
CONCRETE BREAKER/MATCH WAGON (CONTINUED)

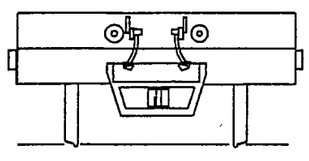
LIMITATIONS IN OPERATION	IN ITS FULLY AND CORRECTLY STOWED CONDITION, THE CONCRETE BREAKER ON ITS WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY PRE-1985 BATTERY LOCOMOTIVE WITH 100 AMP SOCKET IS REQUIRED TO OPERATE THIS EQUIPMENT MUST ONLY WORK WHEN OPERATED BY A FULLY TRAINED, CERTIFIED OPERATOR EAR DEFENDERS, SAFETY GLASSES AND FACE MASK MUST BE WORN BY OPERATOR AND STAFF WORKING WITH THIS MACHINE
SPECIAL FEATURES	DESIGNED FOR REMOTE OPERATION BY AN OPERATOR AT GROUND LEVEL USING A BODY HELD CONTROL PANEL, CONNECTED TO THE MAIN CONTROL UNIT BY USED OF AN UMBILICAL CORD ELECTRICAL SUPPLY IS TAKEN FROM THE 100 AMP SOCKET ON A BATTERY LOCOMOTIVE AT A NOMINAL VOLTAGE OF 320 VOLTS DC

[redacted]

CONCRETE BREAKER MATCH WAGON







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NO.RANGE: FW398	23/11/93	LUL7e

CONCRETE BREAKER/MATCH WAGON

TITLE	CONCRETE BREAKING HAMMER
FUNCTION	TO BREAK THE CONCRETE SLEEPER RETAINING BEDS TUBE AND SUB-SURFACE RUNNING TUNNELS AS PART OF TUNNEL TRACK RECONDITIONING WORK
OPERATION DESCRIPTION	THE CONCRETE BREAKING HAMMER IS MOUNTED ON A 30 TON FLAT WAGON (WAGON Nº FW340). THE CONCRETE BREAKING UNIT IS A 'MONTABERT' BRH125 HYDRAULIC ROCK BREAKER. THE UNIT IS MOUNTED AT THE END OF AN APPROXIMATELY 6 METRE LONG MOUNTING BEAM. THE MOUNTING BEAM IS SUPPORTED BY A CARRIAGEWAY WHICH IN TURN IS FIXED TO THE WAGON DECK. THE CONCRETE BREAKING HAMMER WILL ONLY BREAK CONCRETE BEYOND ONE END OF THE WAGON ON WHICH IT IS MOUNTED; THE HEADSTOCK OF WHICH HAS BEEN REMOVED POWERED BY 'MAUDSLEY' 25HP 320V DC ELECTRIC MOTOR PRIMARY POWER SOURCE: BATTERY LOCOMOTIVE THE CONCRETE BREAKER'S WAGON IS ALWAYS COUPLED TO FLAT WAGON Nº FW398 AT THE CONCRETE BREAKING UNIT END OF THE WAGON, FOR TRAVEL ON THE RAILWAY THE OUTER ENDS OF FW340 AND FW398 ARE FITTED WITH 'WARD' COUPLERS
DELIVERY DATE – MANUFACTURERS NAME	MANUFACTURED 1981 RICHARD SMALLEY ENGINEERING LTD
DESIGN LIFE EXPIRES	(TAKEN AT 20 YEARS) 2001
MODIFICATION DETAILS	SEE APPENDIX FOR FLAT WAGONS ALSO MODIFIED FRONT WHEEL BOGIE SUSPENSION BLOCK

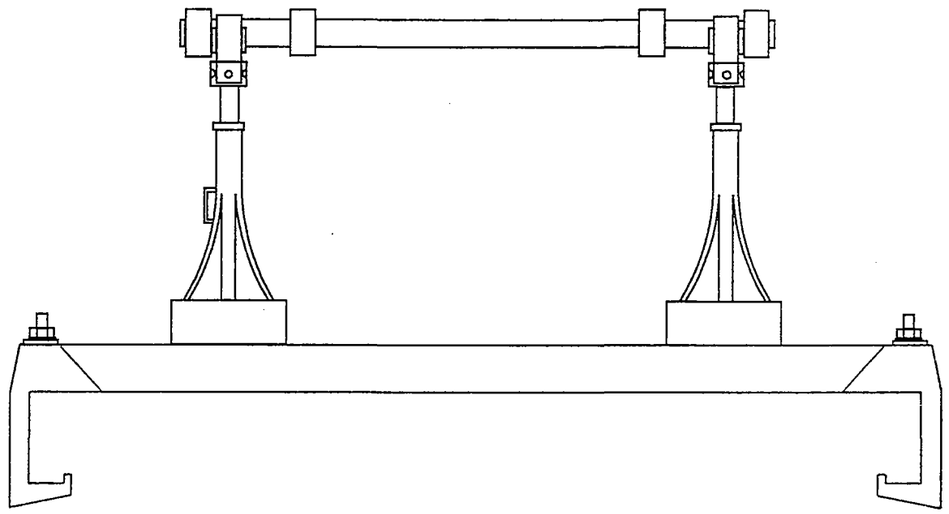
[redacted]

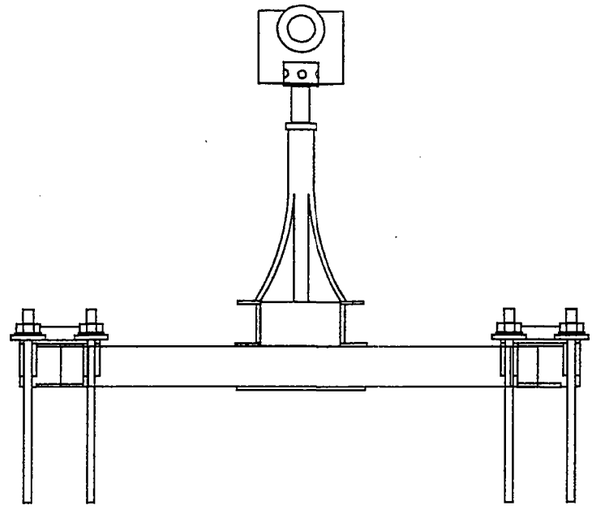
CONCRETE BREAKER/MATCH WAGON (CONTINUED)

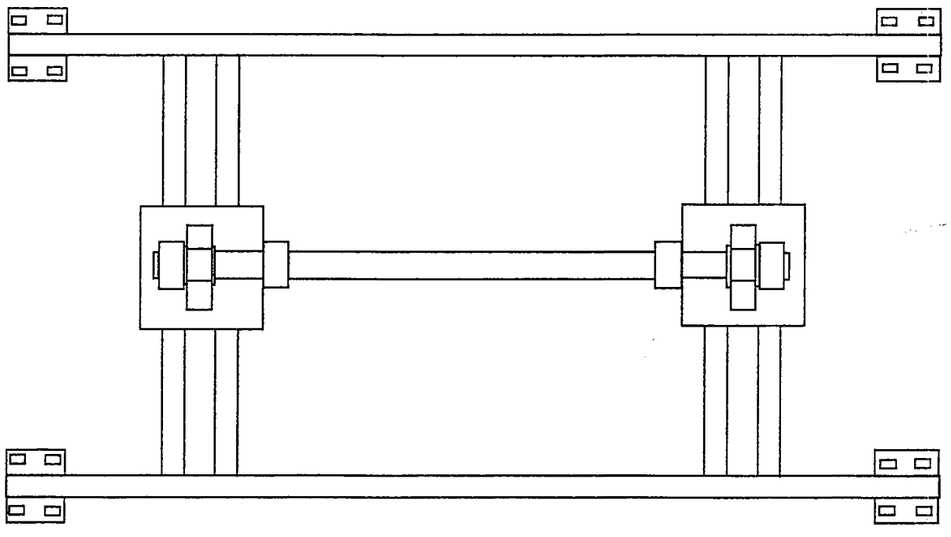
LIMITATIONS IN OPERATION	IN ITS FULLY AND CORRECTLY STOWED CONDITION, THE CONCRETE BREAKER ON ITS WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY PRE-1985 BATTERY LOCOMOTIVE WITH 100 AMP SOCKET IS REQUIRED TO OPERATE THIS EQUIPMENT MUST ONLY WORK WHEN OPERATED BY A FULLY TRAINED, CERTIFIED OPERATOR EAR DEFENDERS, SAFETY GLASSES AND FACE MASK MUST BE WORN BY OPERATOR AND STAFF WORKING WITH THIS MACHINE
SPECIAL FEATURES	DESIGNED FOR REMOTE OPERATION BY AN OPERATOR AT GROUND LEVEL USING A BODY HELD CONTROL PANEL, CONNECTED TO THE MAIN CONTROL UNIT BY USED OF AN UMBILICAL CORD ELECTRICAL SUPPLY IS TAKEN FROM THE 100 AMP SOCKET ON A BATTERY LOCOMOTIVE AT A NOMINAL VOLTAGE OF 320 VOLTS DC

[redacted]

WAGON MOUNTED CABLE DRUM STANDS





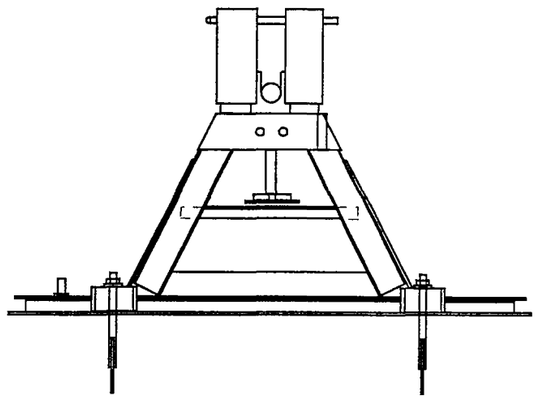


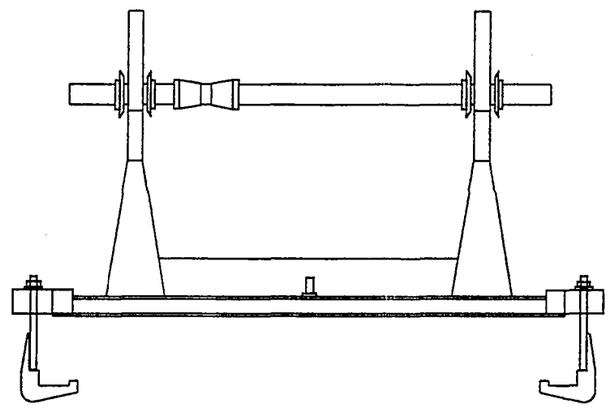
NO.RANGE: MOUNTED ON FLAT WAGONS	23/11/93	LUL7f

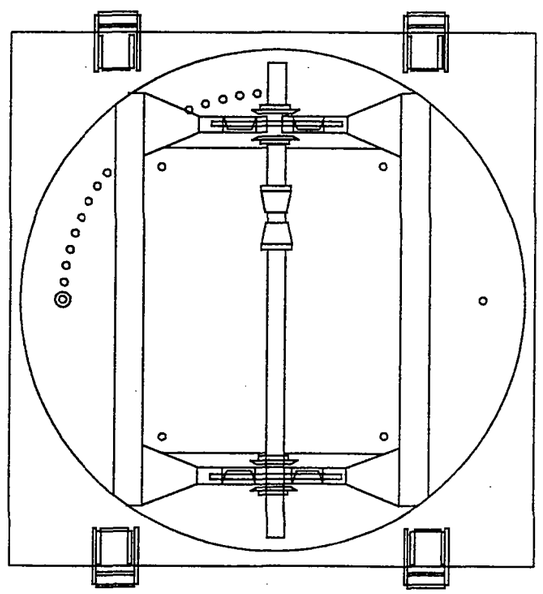
WAGON MOUNTED CABLE DRUM STANDS

TITLE	WAGON MOUNTED CABLE DRUM STANDS
FUNCTION	REELING OFF CABLE
NUMBER RANGE	FITTED TO FLAT WAGONS FW335/FW336
DELIVERY DATE – MANUFACTURERS NAME	1967 JOHNSON & PHILLIPS LTD
DESIGN LIFE EXPIRES	(TAKEN AT 15 YEARS) 1982
MODIFICATION DETAILS	NONE RECORDED
SPECIAL FEATURES	MAX DRUM SIZE 1830mm DIA NORMAL DRUM SIZE 1700mm DIA NORMAL DRUM TYPE ANY UP TO TYPE L MAX DRUM WEIGHT 7.5 TONNES WEIGHT OF L TYPE DRUM 2.3 TONNES WEIGHT OF TURN TABLE 1280 kg

WAGON MOUNTED CABLE DRUM TURNTABLES





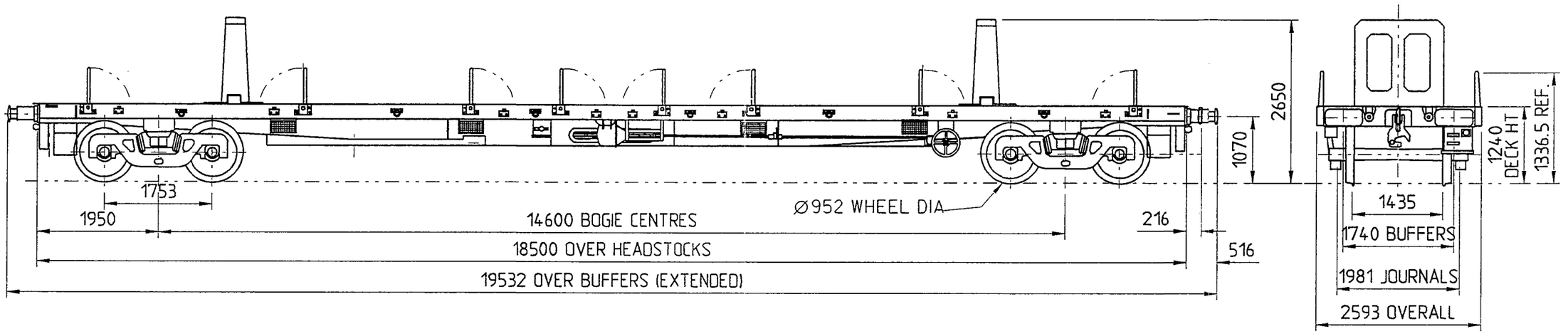


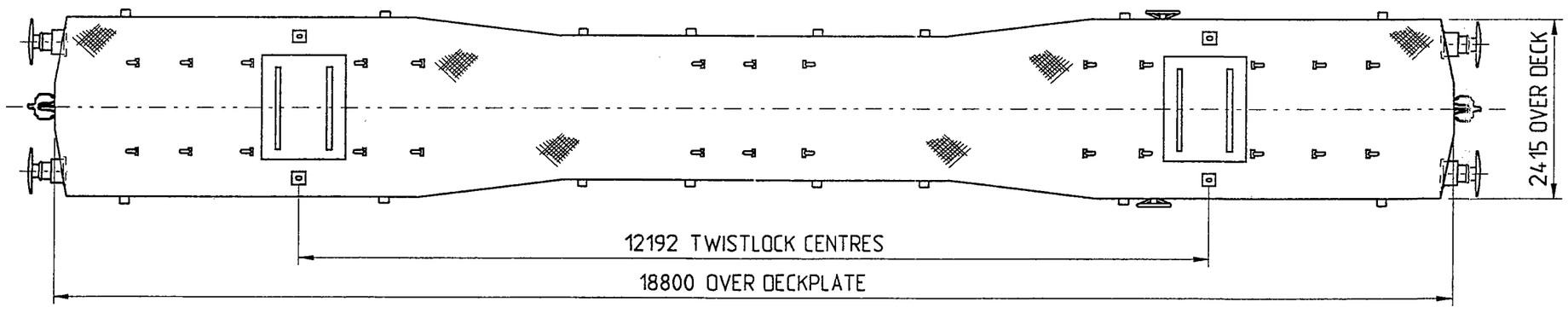
NO.RANGE: MOUNTED ON FLAT WAGONS	23/11/93	LUL7g

WAGON MOUNTED CABLE DRUM TURN TABLES

TITLE	WAGON MOUNTED CABLE DRUM TURN TABLES
FUNCTION	REELING OFF CABLE
NUMBER RANGE	OLD TYPE 1 – 10 NEW TYPE 1 – 18
DELIVERY DATE – MANUFACTURERS NAME	OLD TYPE 1 – 4 SHIRE STEEL MFG.CO.LTD 1985 (ESTIMATED) OLD TYPE 5 – 10 AUTO MOWER ENG.CO.LTD. DELIVERY DATE NOT KNOWN NEW TYPE 1 – 18 PROCOR ENGINEERING 1990 (ESTIMATED)
DESIGN LIFE EXPIRES	(TAKEN AT 15 YEARS) OLD TYPE 1 – 4 2000 (ESTIMATED) OLD TYPE 5 – 10 LIFE EXPIRED NEW TYPE 1 – 18 2005 (ESTIMATED)
MODIFICATION DETAILS	NONE RECORDED
SPECIAL FEATURES	OLD TYPE 1 – 4 FITTED TO FW 358 OLD TYPE 5 – 10 FITTED TO FW 366 NEW TYPE 1 – 4 FITTED TO FW 385 NEW TYPE 5 – 8 FITTED TO FW 394 NEW TYPE 9 – 12 FITTED TO FW 364 NEW TYPE 13 – 16 FITTED TO FW 386 NEW TYPE 17 – 18 FITTED TO FW 353 MAX DRUM SIZE 1830mm DIA NORMAL DRUM SIZE 1700mm DIA NORMAL DRUM TYPE ANY UP TO TYPE L MAX DRUM WEIGHT 7.5 TONNES WEIGHT OF L TYPE DRUM 2.3 TONNES WEIGHT OF TURN TABLE 1280 kg

35 TONNE HEAVY DUTY WAGON (HIGH DECK)





NO.RANGE: HD871 - HD876	23/11/93	LUL8

HIGH DECK WAGONS

TITLE		HIGH DECK BOGIE RAIL WAGON
FUNCTION		TRANSPORTING TRACK PANELS TO AND FROM RELAY SITES
NUMBER RANGE		HD 871 – HD 876
DELIVERY DATE – MANUFACTURERS NAME		1987 PROCOR
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2027
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		22.4 TONNES
LOAD CAPACITY		35 TONNES
BRAKING SYSTEM		AIR BRAKED DAVIES AND METCALFE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE 42"/1070 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		SERVICE SPEED 30 mph (48 kph) MAXIMUM SPEED 45 mph (72 kph)
AXLE BOX TYPE		ROLLER BEARING TIMKEN SP120
ROUTE AVAILABILITY	LOADED –	OUT OF GAUGE ON THE FOLLOWING: JUBILEE LINE SOUTH OF FINCHLEY ROAD NORTHERN LINE ALL SECTIONS VICTORIA LINE ALL SECTIONS PICCADILLY LINE EAST OF BARONS COURT SIDING AND WEST OF NORTHFIELDS CENTRAL LINE EAST OF NORTH ACTON BAKERLOO LINE ALL SECTIONS
	EMPTY –	SEE LUL RULE BOOK APPENDIX 13 PAGE 87 TABLE 8

SPECIAL FEATURES — ELECTRICS

THROUGH ELECTRICS ARE PROVIDED ON THE WAGONS COMPRISING OF:

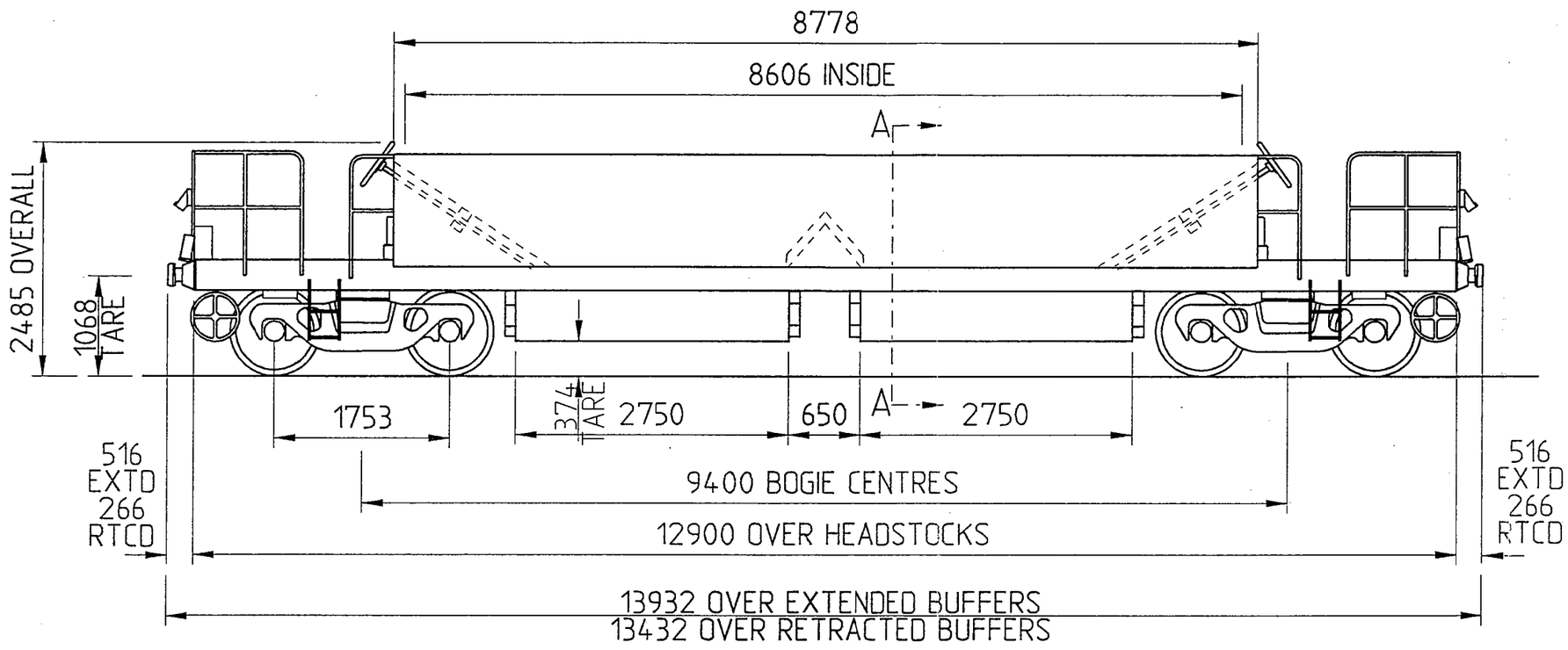
ONE – THROUGH JUMPER RECEPTACLE – RED
ONE – THROUGH JUMPER RECEPTACLE – BLUE
TWO – AC JUMPER BOX SUPPLYING THROUGH AC 3 PHASE AND RECEPTACLE, A THROUGH AC SINGLE PHASE 110V AND RECEPTACLE.

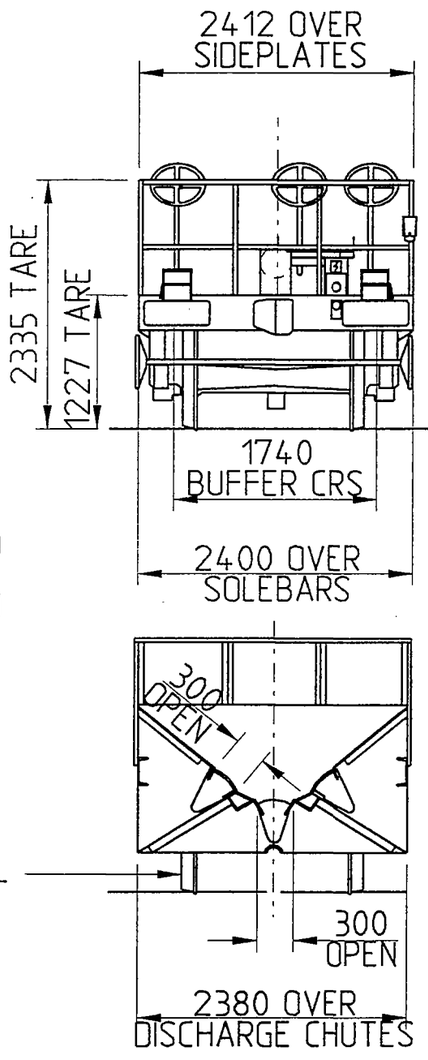
IN ADDITION TWO FURTHER SINGLE PHASE OUTLET SOCKETS ARE PROVIDED, THESE ARE LOCATED ONE AT EACH SIDE OF THE WAGON AT A MID POINT BETWEEN THE HEADSTOCKS.

FOUR FLOOD LIGHTS ARE ALSO PROVIDED ON EACH SIDE OF THE WAGON BELOW THE SOLEBAR.

THE LIGHTING CIRCUIT AND THE SINGLE PHASE SOCKETS ARE ALL PROTECTED BY A DUAL ON–OFF SWITCH AND CIRCUIT BREAKER.

HOPPER WAGON





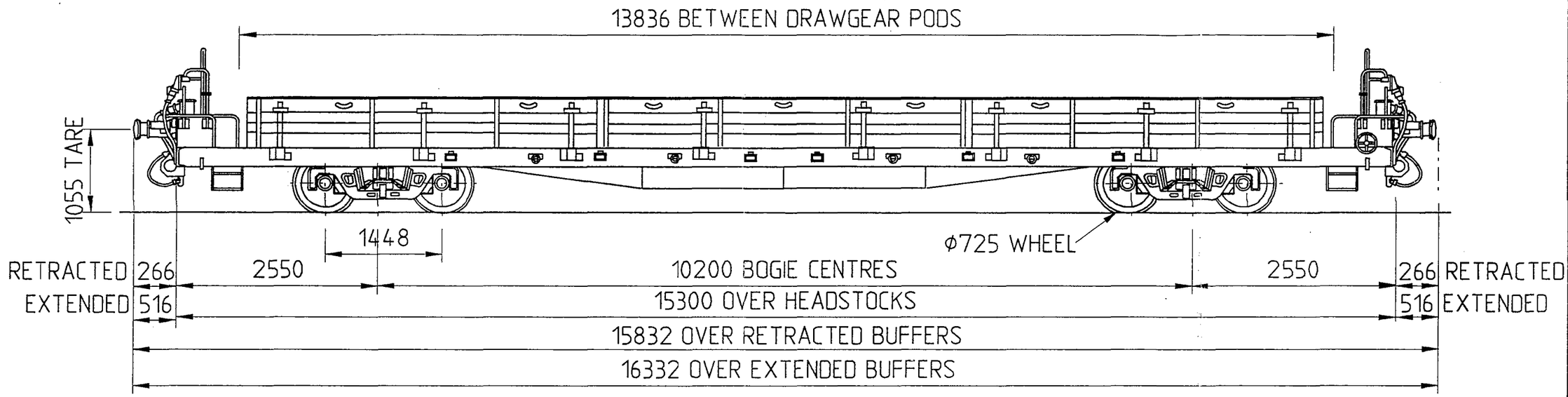
SECTION AA

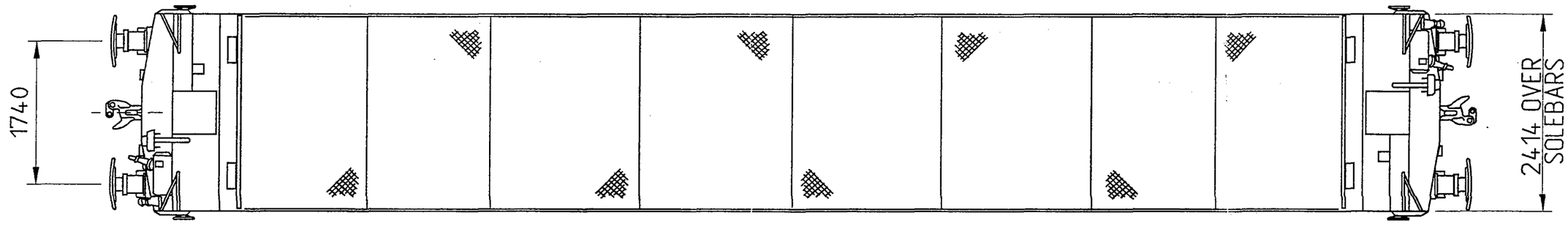
NO.RANGE: HW201 - HW222	23/11/93	LUL9

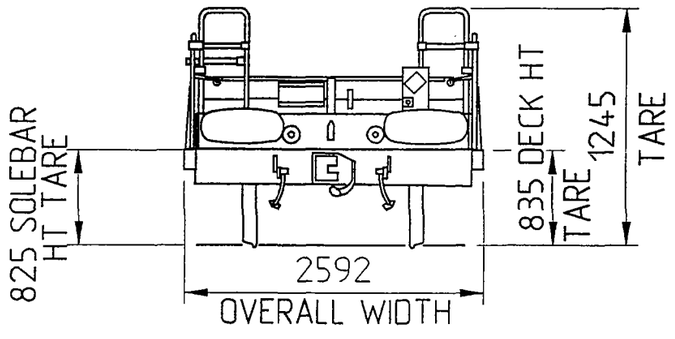
HOPPER WAGONS

TITLE		HOPPER WAGONS
FUNCTION		DELIVERING AND POSITIONING OF BALLAST, SHINGLE AND OTHER GRANULAR MATERIALS
NUMBER RANGE		HW 201 – HW 222
DELIVERY DATE – MANUFACTURERS NAME		1981 W H DAVIS
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2021
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		22.600 TONNES
LOAD CAPACITY		30 TONNES / 18.8 CUBIC METRES
BRAKING SYSTEM		AIR BRAKED TWO PIPE WESTINGHOUSE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE/RCH 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 40 MPH (72 kph) MAX
AXLE BOX TYPE		TAPER ROLLER BEARING UNITS $5^1/_2$ X 10" CLASS 'D' TYPE AAR–23
ROUTE AVAILABILITY		CONFORMS TO LUL TUBE LOAD GAUGE
SPECIAL FEATURES		TRACK LIGHTING FITTED AT SOLEBAR LEVEL

GENERAL PURPOSE WAGON





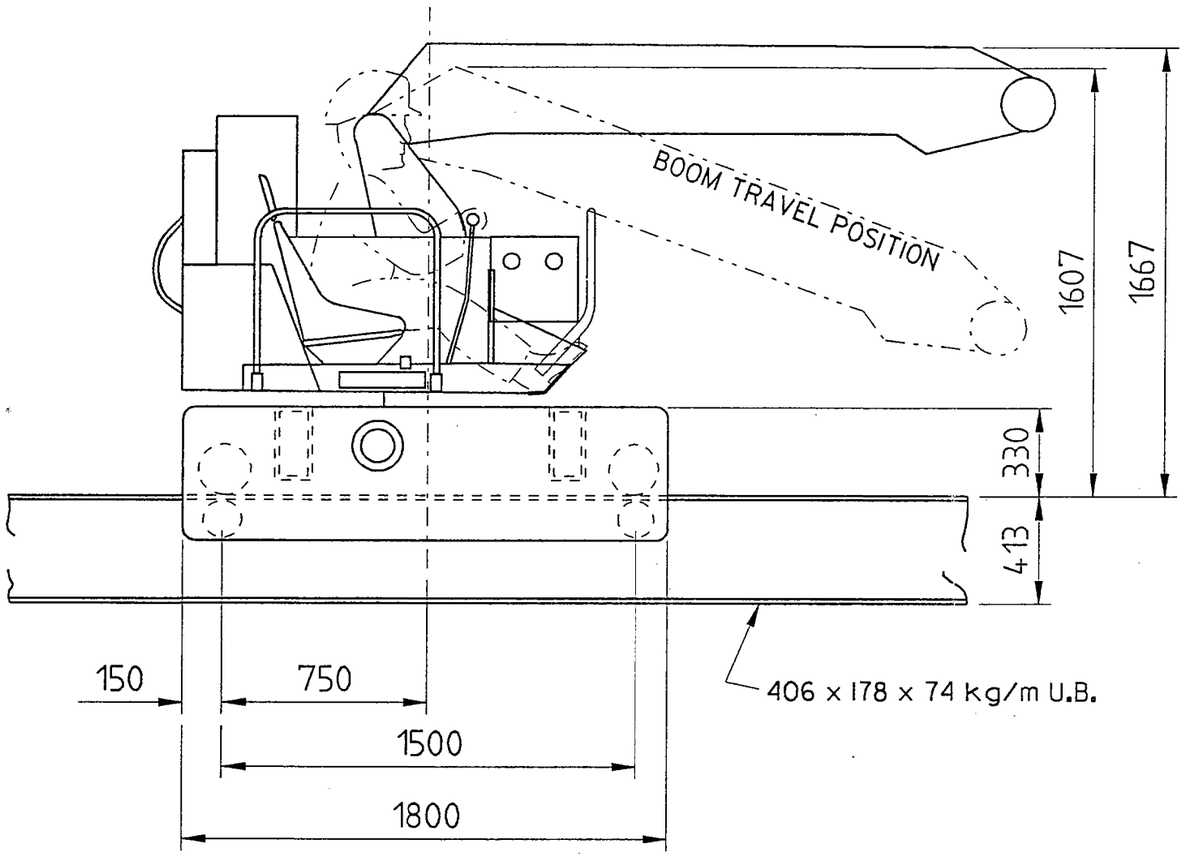


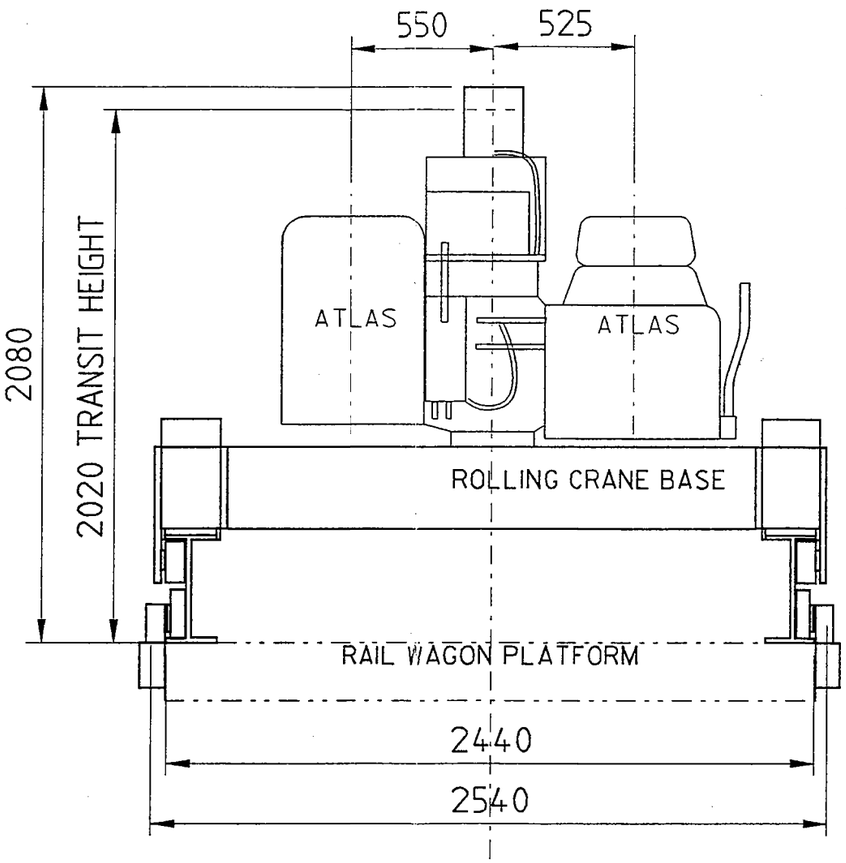
NO.RANGE: GP901 - GP941	23/11/93	LUL10a

GENERAL PURPOSE WAGONS

TITLE		GENERAL PURPOSE WAGONS
FUNCTION		TRANSPORT OF GENERAL ENGINEERING MATERIALS
NUMBER RANGE		GP901 – GP941
DELIVERY DATE – MANUFACTURERS NAME		1985 PROCOR
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2025
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		19 TONNES
LOAD CAPACITY		30 TONNES / 19.5 CUBIC METRES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	RETRACTABLE BUFFERS, BUCKEYE/RCH 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		ROLLER BEARING TIMKEN SP 120 OR SKF TBU 120
ROUTE AVAILABILITY		CONFORMS TO LUL TUBE LOAD GAUGE FULL ROUTE AVAILABILITY
SPECIAL FEATURES		GP901 – ATLAS ROLLOADER GP902 – STEINER TRENCH DIGGER

WAGON MOUNTED ATLAS ROLL LOADER



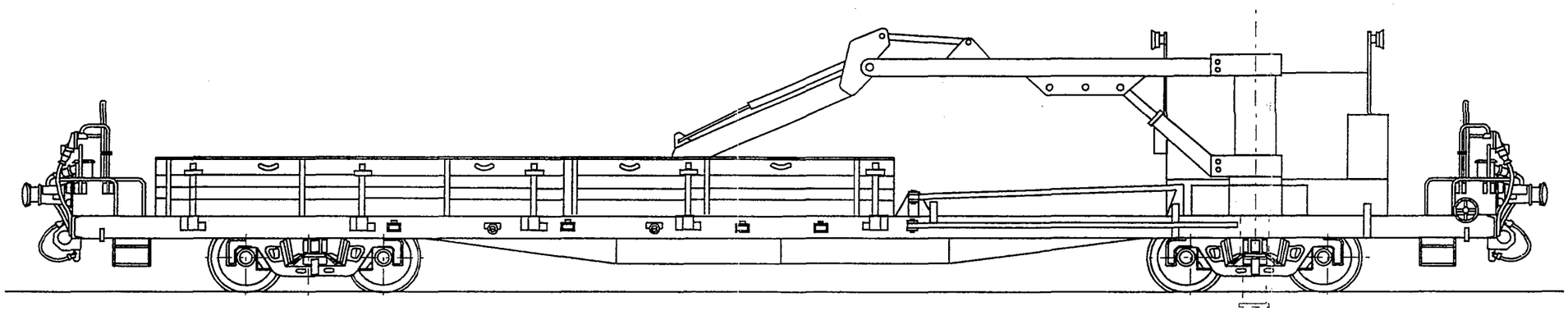


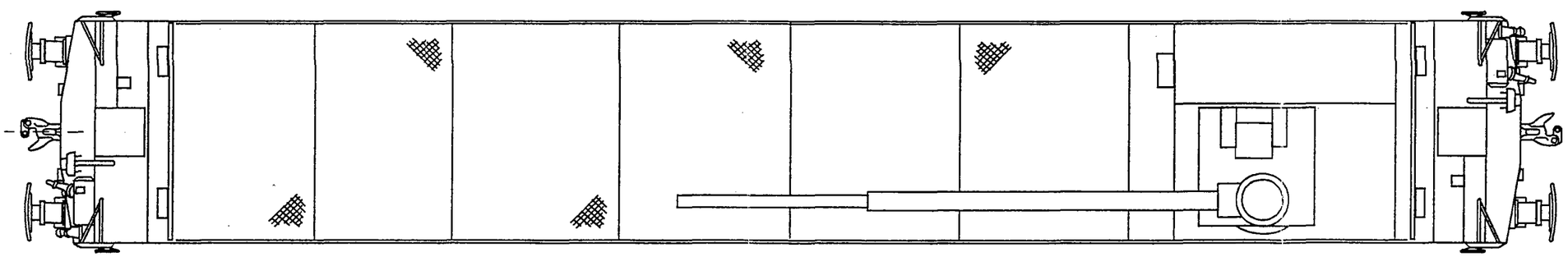
NO.RANGE: MOUNTED ON GP901	23/11/93	LUL10b

ATLAS ROLLOADER – WAGON MOUNTED MULTI PURPOSE JIB

TITLE	ATLAS 100.1 WAGON MOUNTED ROLL LOADER CRANE
FUNCTION	TO PROVIDE A MEANS OF HANDLING ALL TYPES OF PLANT, EQUIPMENT, PALLETISED GOODS AND ALL TYPES OF MATERIALS USED IN TRACK AND INFRASTRUCTURE MAINTENANCE UP TO THE CAPACITY OF THE CRANE.
DELIVERY DATE – MANUFACTURERS NAME	1987 ATLAS HYDRAULIC LOADERS LTD
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) 2027
MODIFICATION DETAILS	FEBRUARY 1993 SEE CONTRACT PH036
LIMITATION IN OPERATION	IN ITS FULLY AND CORRECTLY STOWED CONDITION THE CRANE ON ITS WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS. FULL ROUTE AVAILABILITY MUST NOT CARRY A LOAD ON ITS JIB WHEN ITS WAGON IS MOVING
SPECIAL FEATURES	THE CRANE IS MOUNTED ON A 30 TONNE GENERAL PURPOSE WAGON. THE CRANE IS MOUNTED ON A CARRIAGE WHICH CAN BE DRIVEN ALONG THE 13.8M LONG CARRIAGEWAY THAT IS ATTACHED TO THE DECK OF THE WAGON. THE CRANE'S JIB PIVOT POINT IS ON THE LONGITUDINAL CENTRELINE OF THE WAGON. AT ITS MAXIMUM RADIUS OF 7.2M THE CRANE CAN LIFT 2.9 TONNE. POWERED BY: 'DEUTZ' AIR-COOLED DIESEL ENGINE

TRENCH DIGGER





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NO.RANGE: MOUNTED ON GP902	23/11/93	LUL10c

TRENCH DIGGER

TITLE		STEINER HSM 800 MECHANICAL EXCAVATOR
FUNCTION		TO CARRY OUT TRACKSIDE DRAINAGE EXCAVATIONS TO PROVIDE A MEANS OF HANDLING ALL TYPES OF TRACKSIDE DRAINAGE MATERIALS
DELIVERY DATE – MANUFACTURERS NAME		1981 H STEINER LTD STOKE-ON-TRENT
DESIGN LIFE EXPIRES		(TAKEN AT 20 YEARS) 2001
MODIFICATION DETAILS	also	SEE APPENDIX FOR GP WAGON MODIFIED ENGINE ACCESS PIPE MODIFIED EXHAUST SYSTEM
LIMITATIONS IN OPERATION		IN ITS FULLY AND CORRECTLY STOWED CONDITION THE MECHANICAL EXCAVATOR ON ITS WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY MUST NOT CARRY A LOAD ON ITS JIB WHEN ITS WAGON IS MOVING
SPECIAL FEATURES		THE EXCAVATOR IS MOUNTED ON A 30 TON GENERAL PURPOSE WAGON THE EXCAVATOR IS CAPABLE OF EXCAVATING UP TO A MAXIMUM DEPTH OF APPROXIMATELY 3.5M BELOW RAIL LEVEL (SEE DRAWING Nº ME/PW/D80715) THE EXCAVATOR IN ITS 'CRANE' MODE IS CAPABLE OF LIFTING 560KG AT 6.7M RADIUS AND 1000KG AT 3.85M RADIUS (SEE MACHINE'S SWL CHART) POWERED BY: 'FORD' WATER COOLED DIESEL ENGINE

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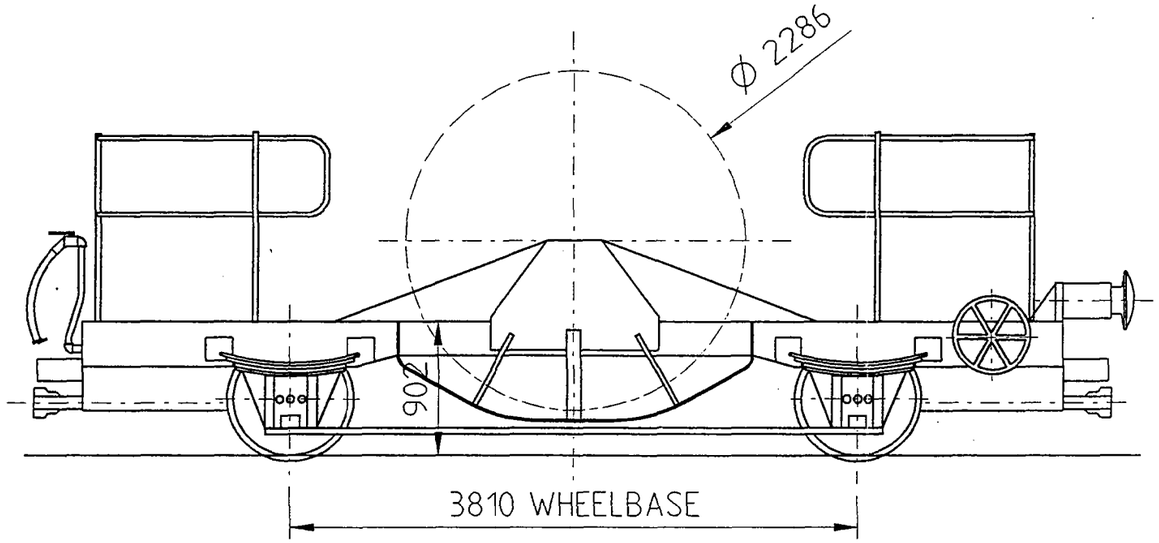
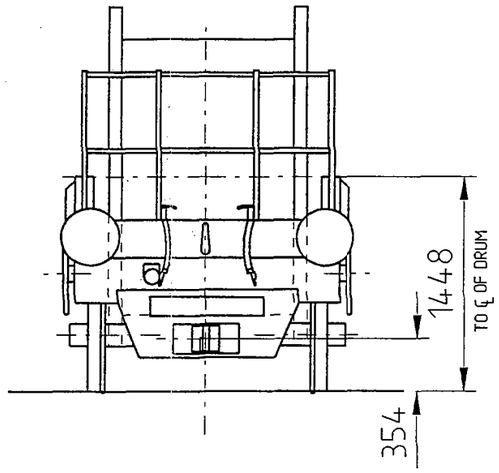
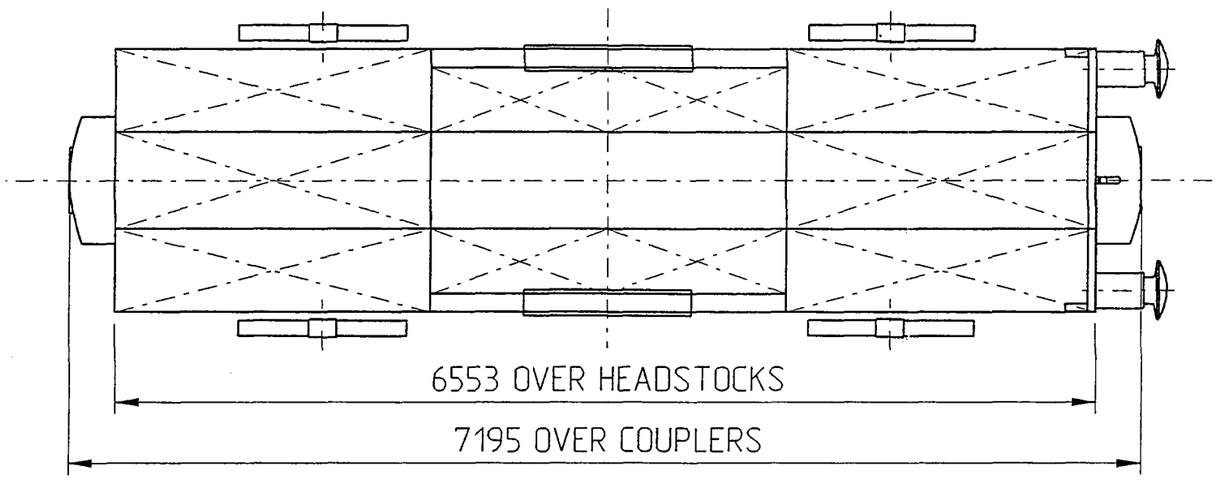
DEEP WELL CABLE DRUM WAGON (END VEHICLE)







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NO.RANGE: CW1051, CW1052	23/11/93	LULIIa

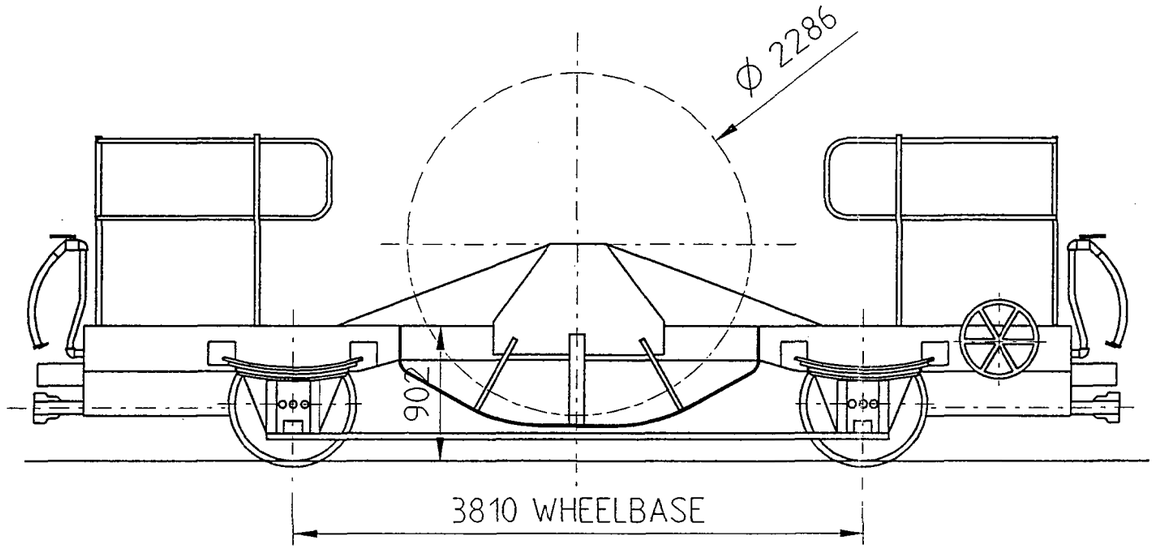
DEEP WELL CABLE DRUM WAGONS

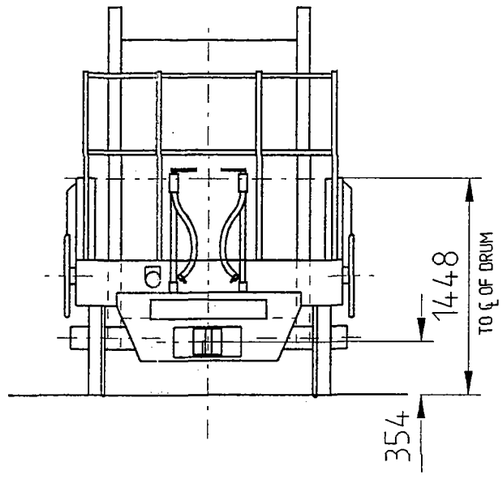
TITLE		DEEP WELL CABLE DRUM WAGONS
FUNCTION		REELING OFF CABLE
NUMBER RANGE		CW 1050 - CW 1052
DELIVERY DATE - MANUFACTURERS NAME		1940 GLOUCESTER WAGON CO
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 1980
MODIFICATION DETAILS		NONE RECORDED
TARE WEIGHT		10 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE TRIPLE VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD COUPLERS (SPECIAL) 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		MAX 45MPH (72 mph) LAYING CABLE 4 MPH (6.4 kph)
AXLE BOX TYPE		OIL
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		DEEP WELL VEHICLES ABILITY TO CARRY CABLES TO SITE

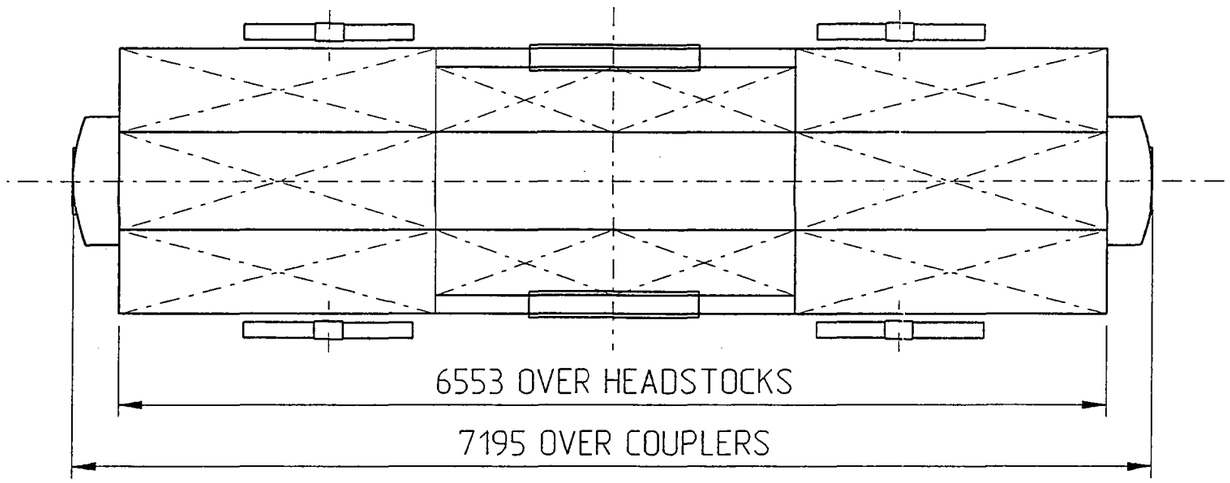
MAX DRUM SIZE	2300mm DIA
NORMAL DRUM SIZE	2200mm DIA
NORMAL DRUM TYPE	ANY UP TO TYPE N
MAX DRUM WEIGHT	6.5 TONNES
WEIGHT OF N TYPE DRUM	3.6 TONNES

[redacted]

DEEP WELL CABLE DRUM WAGON (INNER VEHICLE)







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NO.RANGE: CW1050	23/11/93	LULIIb

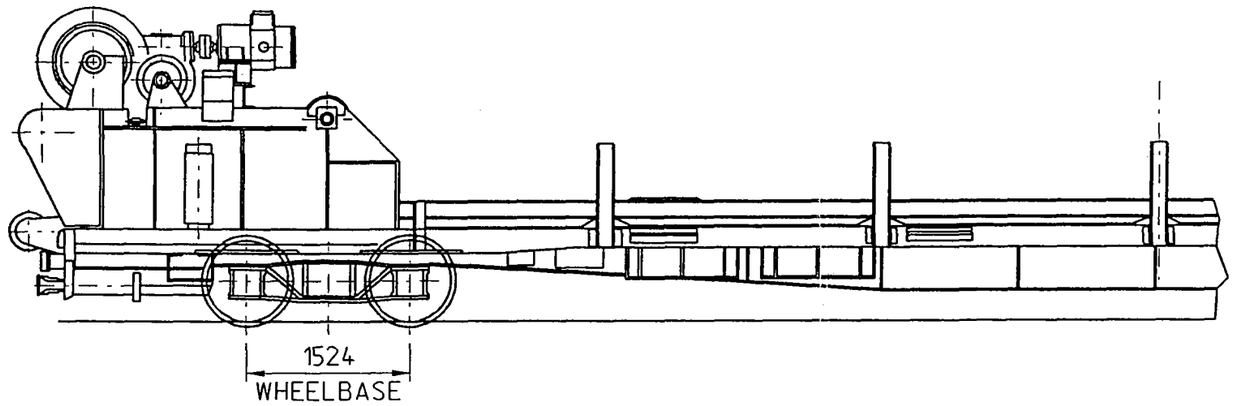
DEEP WELL CABLE DRUM WAGONS

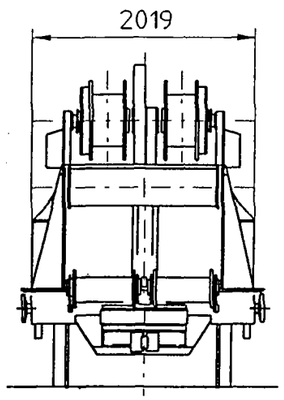
TITLE		DEEP WELL CABLE DRUM WAGONS
FUNCTION		REELING OFF CABLE
NUMBER RANGE		CW 1050 – CW 1052
DELIVERY DATE – MANUFACTURERS NAME		1940 GLOUCESTER WAGON CO
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 1980
MODIFICATION DETAILS		NONE RECORDED
TARE WEIGHT		10 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE TRIPLE VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD COUPLERS (SPECIAL) 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		MAX 45MPH (72 mph) LAYING CABLE 4 MPH (6.4 kph)
AXLE BOX TYPE		OIL
ROUTE AVAILABILITY		NO RESTRICTIONS
SPECIAL FEATURES		DEEP WELL VEHICLES ABILITY TO CARRY CABLES TO SITE

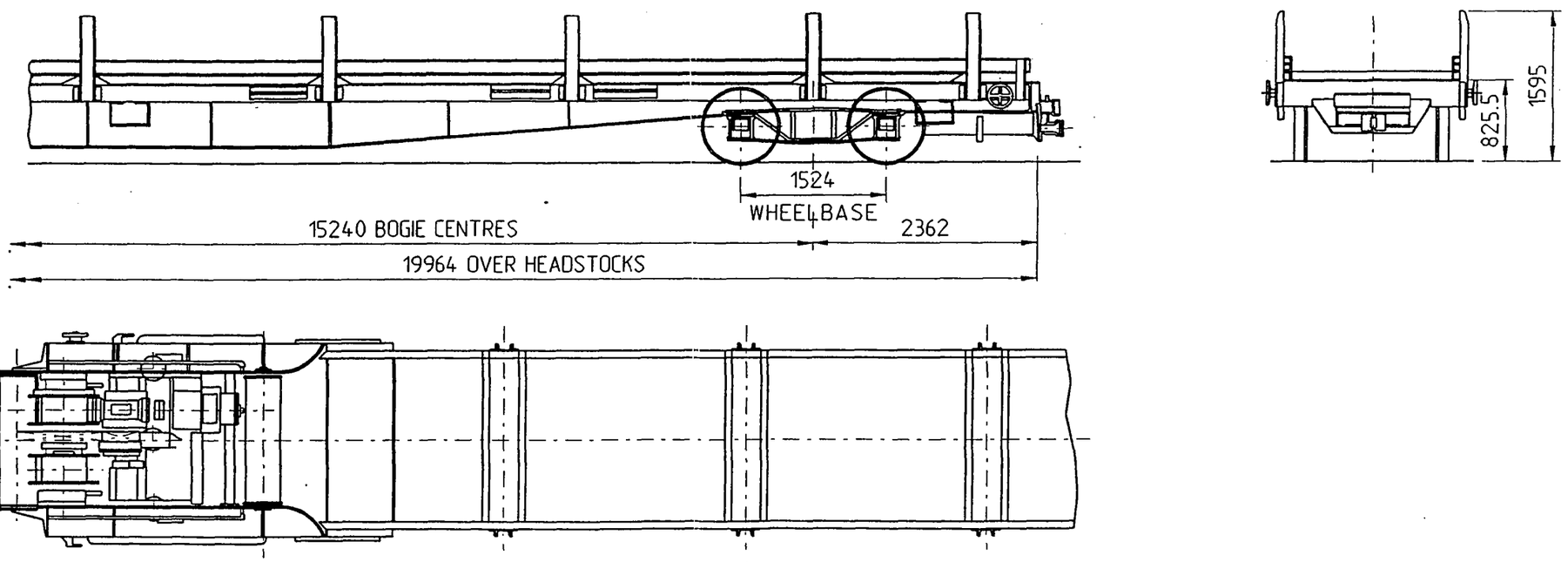
MAX DRUM SIZE	2300mm DIA
NORMAL DRUM SIZE	2200mm DIA
NORMAL DRUM TYPE	ANY UP TO TYPE N
MAX DRUM WEIGHT	6.5 TONNES
WEIGHT OF N TYPE DRUM	3.6 TONNES

[redacted]

L.W.R. WINCH WAGON







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NO.RANGE: RW490	23/11/93	LUL12a

LONG WELDED RAIL TRAINS

TITLE		LONG WELDED RAIL TRAINS
FUNCTION		TO CARRY, UNLOAD AND LOAD LONG WELDED RAILS
NUMBER RANGE		RW 490 – RW 504
OPERATION DESCRIPTION		CHUTE UNITS ARE FITTED AT THE EXTREME ENDS OF EACH SET, FOR THE ON – AND OFF – LOADING OF LONG WELDED RAIL. WAGON RW 490 IS FITTED WITH A WINCH UNIT.
DELIVERY DATE – MANUFACTURES NAME –		RW 490 – RW 494 GLOUCESTER WAGON CO LTD 1958 RW 495 – RW 504 BREL ASHFORD 1965
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) RW 490 – RW 494 – 1998 RW 495 – RW 504 – 2005
MODIFICATION DETAILS		MODIFIED ROLLER GUIDES FOR 95lb BH RAIL
TARE WEIGHT		18 TONNES (WITH WINCH UNIT 21 TONNES)
LOAD CAPACITY		20 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE SPRING PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30MPH (48 kph) SERVICE 45MPH (72 kph) MAX
AXLE BOX TYPE		SKF ROLLER
LIMITATIONS IN OPERATION		CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS RESTRICTED FROM SOME SIDINGS AND REVERSING BERTHS DUE TO LENGTH. SEE RULE BOOK APPENDIX 13 TABLE 4 PAGES 67 – 80. MUST ONLY LOAD/UNLOAD RAIL WHEN TRACTION CURRENT IS 'OFF'
SPECIAL FEATURES		RW 490 – WINCH UNIT RW 494, 495, 499, 500, 504 – CHUTE UNITS

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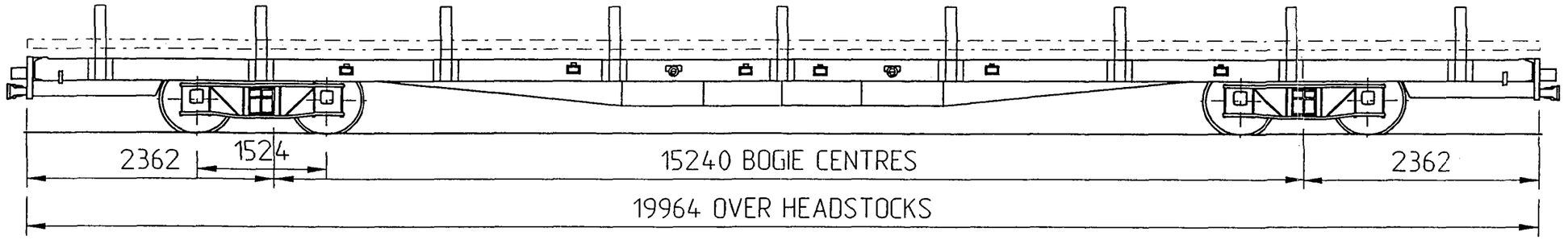
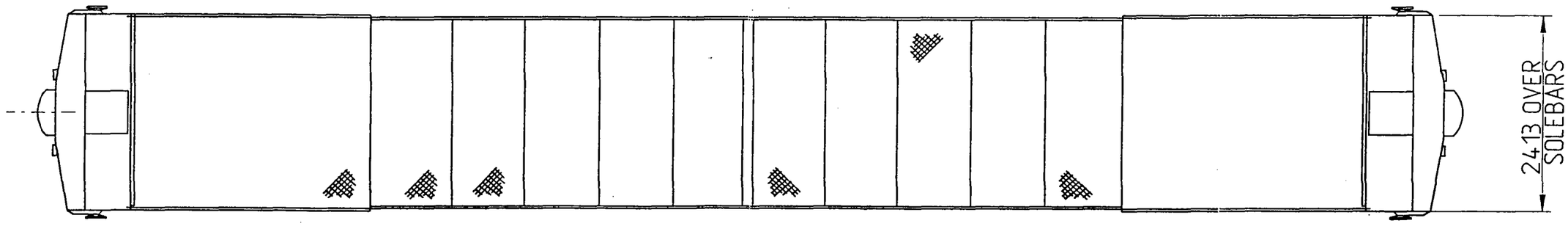
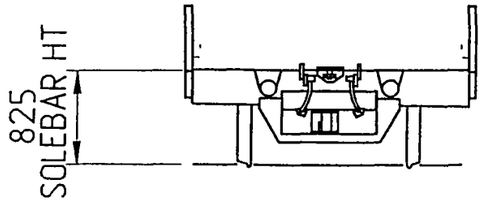
L.W.R. TRAIN 20 TONNE RAIL WAGON





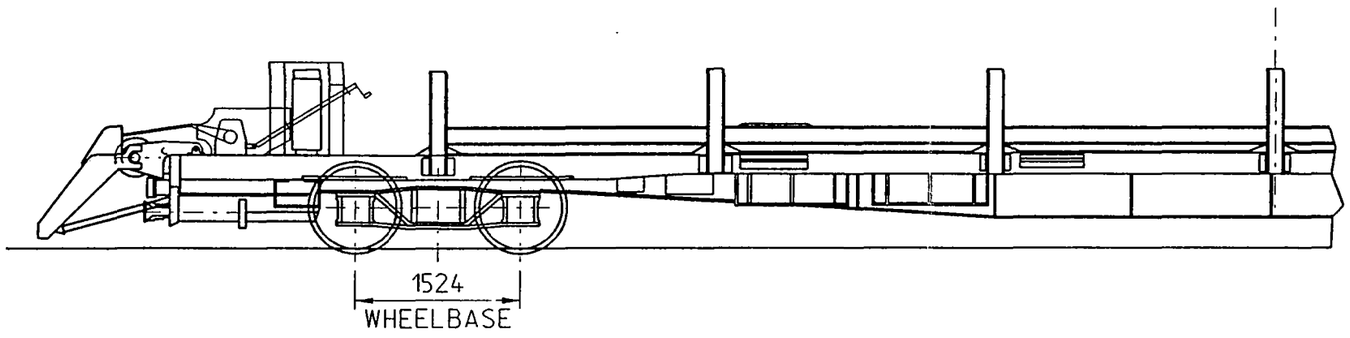


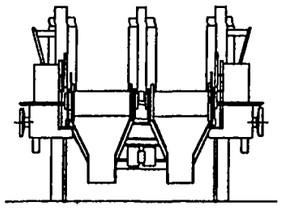
NO.RANGE:RW491 - 493, 496 - 498, 501 - 503	23/11/93	LUL12b

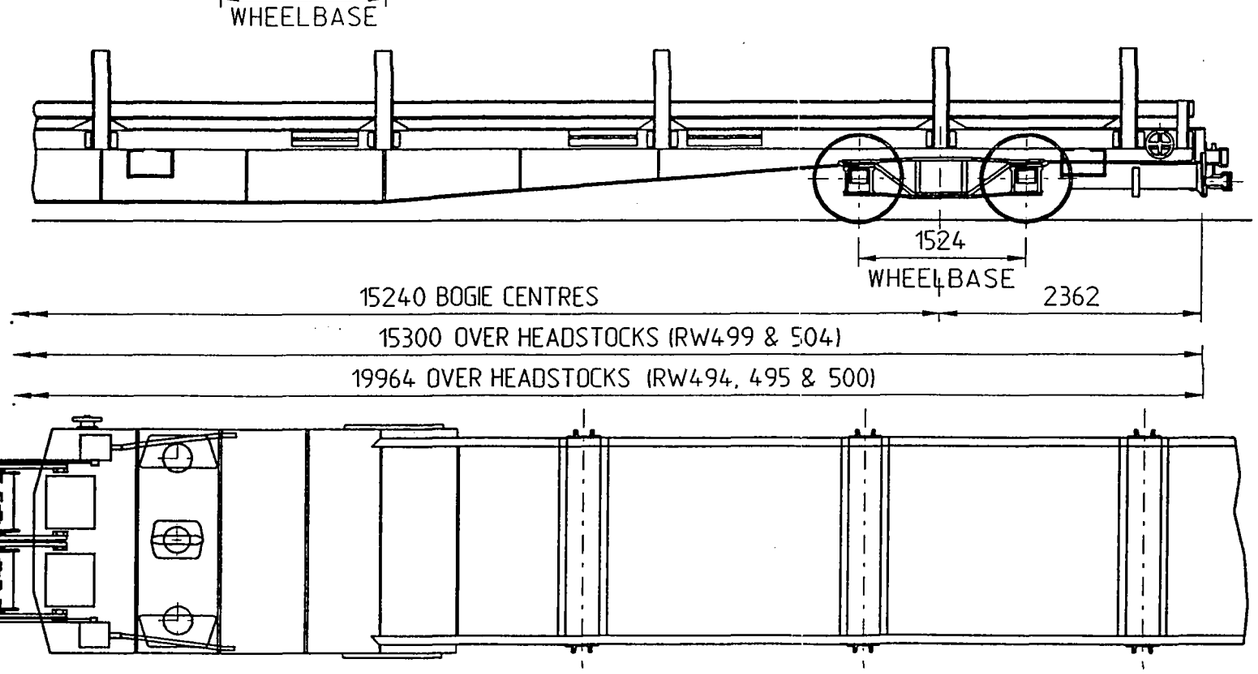
LONG WELDED RAIL TRAINS

TITLE		LONG WELDED RAIL TRAINS
FUNCTION		TO CARRY, UNLOAD AND LOAD LONG WELDED RAILS
NUMBER RANGE		RW 490 – RW 504
OPERATION DESCRIPTION		CHUTE UNITS ARE FITTED AT THE EXTREME ENDS OF EACH SET, FOR THE ON – AND OFF – LOADING OF LONG WELDED RAIL. WAGON RW 490 IS FITTED WITH A WINCH UNIT.
DELIVERY DATE – MANUFACTURES NAME –		RW 490 – RW 494 GLOUCESTER WAGON CO LTD 1958 RW 495 – RW 504 BREL ASHFORD 1965
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) RW 490 – RW 494 – 1998 RW 495 – RW 504 – 2005
MODIFICATION DETAILS		MODIFIED ROLLER GUIDES FOR 95lb BH RAIL
TARE WEIGHT		18 TONNES (WITH WINCH UNIT 21 TONNES)
LOAD CAPACITY		20 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE SPRING PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30MPH (48 kph) SERVICE 45MPH (72 kph) MAX
AXLE BOX TYPE		SKF ROLLER
LIMITATIONS IN OPERATION		CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS RESTRICTED FROM SOME SIDINGS AND REVERSING BERTHS DUE TO LENGTH. SEE RULE BOOK APPENDIX 13 TABLE 4 PAGES 67 – 80. MUST ONLY LOAD/UNLOAD RAIL WHEN TRACTION CURRENT IS 'OFF'
SPECIAL FEATURES		RW 490 – WINCH UNIT RW 494, 495, 499, 500, 504 – CHUTE UNITS

L.W.R. CHUTE WAGON





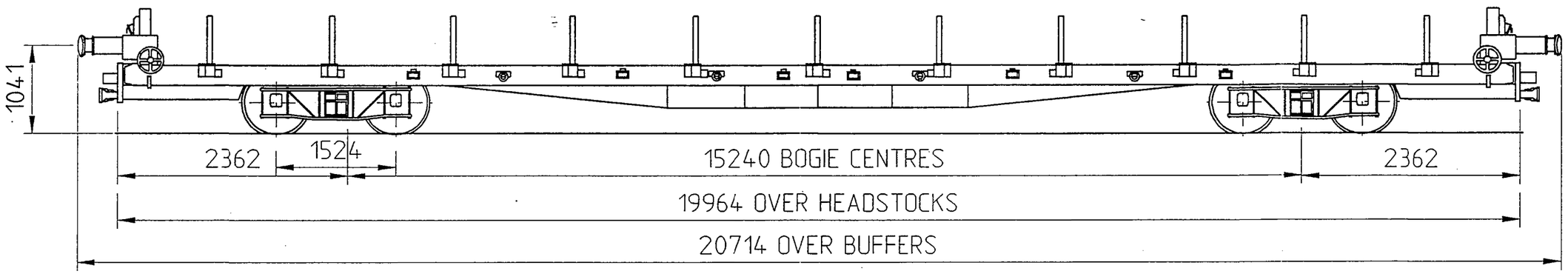


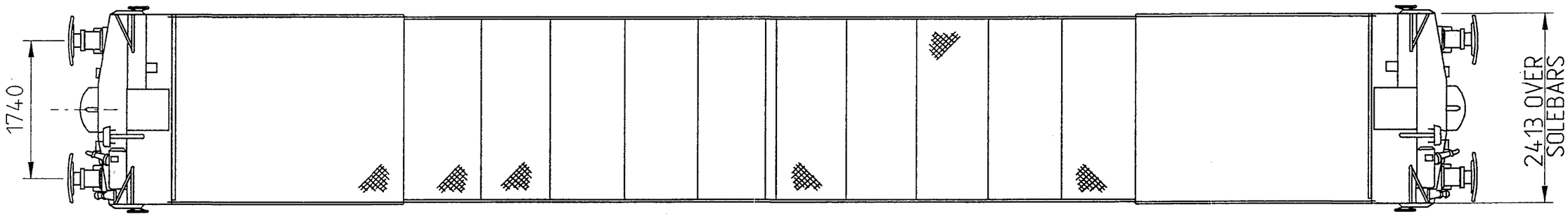
NO.RANGE: RW494, 495, 499, 500, 504	23/11/93	LUL12c

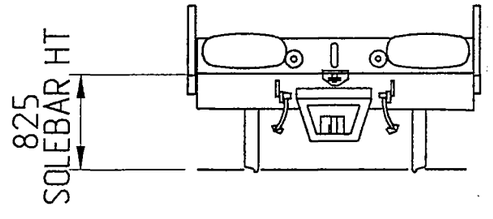
LONG WELDED RAIL TRAINS

TITLE		LONG WELDED RAIL TRAINS
FUNCTION		TO CARRY, UNLOAD AND LOAD LONG WELDED RAILS
NUMBER RANGE		RW 490 – RW 504
OPERATION DESCRIPTION		CHUTE UNITS ARE FITTED AT THE EXTREME ENDS OF EACH SET, FOR THE ON – AND OFF – LOADING OF LONG WELDED RAIL. WAGON RW 490 IS FITTED WITH A WINCH UNIT.
DELIVERY DATE – MANUFACTURES NAME –		RW 490 – RW 494 GLOUCESTER WAGON CO LTD 1958 RW 495 – RW 504 BREL ASHFORD 1965
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) RW 490 – RW 494 – 1998 RW 495 – RW 504 – 2005
MODIFICATION DETAILS		MODIFIED ROLLER GUIDES FOR 95lb BH RAIL
TARE WEIGHT		18 TONNES (WITH WINCH UNIT 21 TONNES)
LOAD CAPACITY		20 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE SPRING PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30MPH (48 kph) SERVICE 45MPH (72 kph) MAX
AXLE BOX TYPE		SKF ROLLER
LIMITATIONS IN OPERATION		CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS RESTRICTED FROM SOME SIDINGS AND REVERSING BERTHS DUE TO LENGTH. SEE RULE BOOK APPENDIX 13 TABLE 4 PAGES 67 – 80. MUST ONLY LOAD/UNLOAD RAIL WHEN TRACTION CURRENT IS 'OFF'
SPECIAL FEATURES		RW 490 – WINCH UNIT RW 494, 495, 499, 500, 504 – CHUTE UNITS

20 TONNE RAIL WAGON







NO.RANGE: RW505, RW506	23/11/93	LUL13a

RAIL WAGONS

TITLE		20 TONNE CAPACITY BOGIE RAIL WAGON
FUNCTION		TRANSPORTING RAILS
NUMBER RANGE		RW 505 – RW 506 RW 801 – RW 826
DELIVERY DATE – MANUFACTURERS NAME		RW 505 – RW 506 1965 BREL ASHFORD RW 801 – RW 826 1986 PROCOR LTD
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) RW 505 – RW 506 2005 RW 801 – RW 826 2026
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		18 TONNES
LOAD CAPACITY		20 TONNES 21 x 60ft BULLHEAD RAILS 17 x 60ft FLAT BOTTOM RAILS
BRAKING SYSTEM		AIR BRAKED DAVIES AND METCALFE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE	RW 505 – RW 506 WARD/RCH
	HEIGHT FROM RAIL	14"/355mm AND 41.5"/1055mm RW 810 – RW 826 BUCKEYE 41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 mph (48 kph) SERVICE 45 mph (72 kph) MAX
AXLE BOX TYPE		ROLLER BEARING RW 505 – RW 506 SKF RW 801 – RW 826 TIMKEN SP 120
ROUTE AVAILABILITY		CONFORM TO LONDON UNDERGROUND LTD TUBE VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY MUST ONLY LOAD/UNLOAD RAIL WHEN TRACTION CURRENT IS 'OFF'

RAIL WAGONS (CONTINUED)

SPECIAL FEATURES

RW 505 – RW 506

ABILITY TO LOAD/UNLOAD RAIL OVER ENDS IN TUBE SECTIONS

RW 801 – RW 826

EACH WAGON IS SUPPLIED WITH 10 WAY THROUGH CONTROL WIRING, CONNECTING 10 PIN JUMPER RECEPTACLE BOXES, POSITIONED AT THE HEADSTOCKS. ONE RED AND ONE BLUE RECEPTACLE BOX IS FITTED TO EACH HEADSTOCK.

AN AUXILIARY POWER SOCKET IS PROVIDED AT EACH END OF THE WAGON FOR PASSING A 110 VOLT 63 AMP A.C. POWER SUPPLY DOWN THE TRAIN. ADJACENT TO EACH OF THESE THERE IS AN ADDITIONAL SOCKET FOR 110 VOLT 16 AMP SINGLE PHASE POWER SUPPLY CONTROLLED BY AN M.C.B. RATED UP TO 16 AMPS.

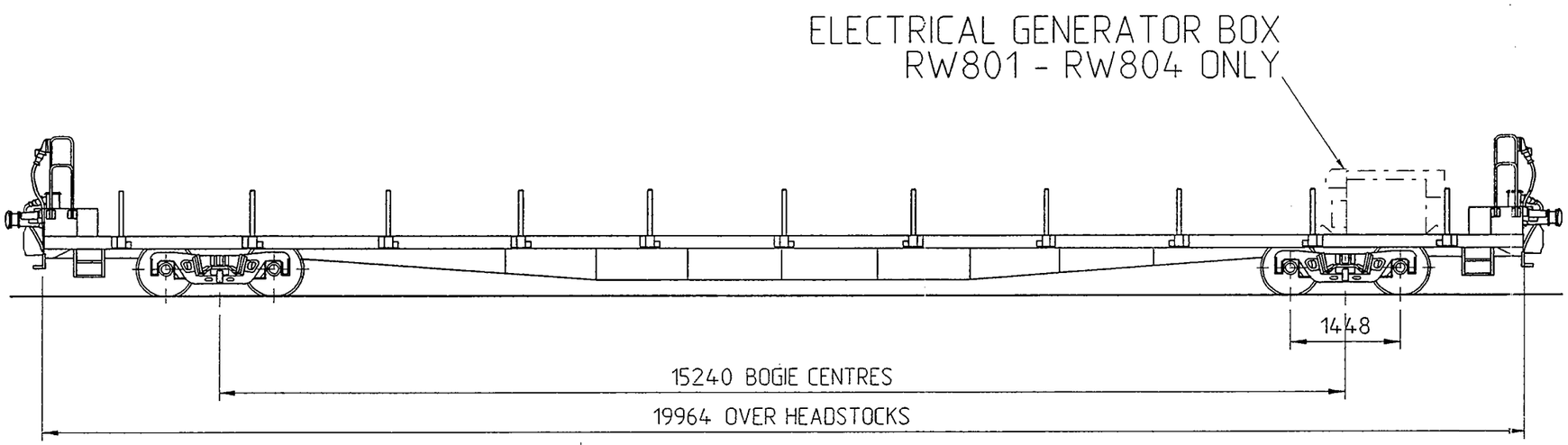
AUXILIARY POWER JUMPER CABLES SUITABLE FOR CONNECTING ADJOINING WAGONS ARE ALSO SUPPLIED.

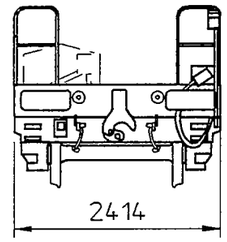
IN ADDITION EACH WAGON HAS AN INTEGRAL CIRCUIT FOR THE SUPPLY OF POWER TO ELK CRANES MOUNTED ON THE UNDERFRAME. THE CIRCUIT IS TERMINATED AT EACH SIDE OF THE WAGON WITH A 110 VOLT SOCKET OUTLET CONTROLLED BY AN M.C.B. RATED UP TO 32 AMPS.

SIDE STANCHIONS

EACH SIDE OF THE WAGON IS FITTED WITH SIDE STANCHIONS WHICH SHALL, IF REQUIRED, SUPPORT SIDE BOARDS FOR THE RETENTION OF THE LOAD. EACH STANCHION SHALL HAVE A SUITABLE BRACKET TO SUPPORT IT IN THE LOWERED POSITION.

20 TONNE RAIL WAGON





NO.RANGE: RW801 - RW826	23/11/93	LUL13b

RAIL WAGONS

TITLE		20 TONNE CAPACITY BOGIE RAIL WAGON
FUNCTION		TRANSPORTING RAILS
NUMBER RANGE		RW 505 – RW 506 RW 801 – RW 826
DELIVERY DATE – MANUFACTURERS NAME		RW 505 – RW 506 1965 BREL ASHFORD RW 801 – RW 826 1986 PROCOR LTD
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) RW 505 – RW 506 2005 RW 801 – RW 826 2026
MODIFICATION DETAILS		SEE APPENDIX
TARE WEIGHT		18 TONNES
LOAD CAPACITY		20 TONNES 21 x 60ft BULLHEAD RAILS 17 x 60ft FLAT BOTTOM RAILS
BRAKING SYSTEM		AIR BRAKED DAVIES AND METCALFE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE
COUPLINGS	TYPE HEIGHT FROM RAIL	RW 505 – RW 506 WARD/RCH 14"/355mm AND 41.5"/1055mm RW 810 – RW 826 BUCKEYE 41.5"/1055mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 mph (48 kph) SERVICE 45 mph (72 kph) MAX
AXLE BOX TYPE		ROLLER BEARING RW 505 – RW 506 SKF RW 801 – RW 826 TIMKEN SP 120
ROUTE AVAILABILITY		CONFORM TO LONDON UNDERGROUND LTD TUBE VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY MUST ONLY LOAD/UNLOAD RAIL WHEN TRACTION CURRENT IS 'OFF'

RAIL WAGONS (CONTINUED)

SPECIAL FEATURES

RW 505 – RW 506

ABILITY TO LOAD/UNLOAD RAIL OVER ENDS IN TUBE SECTIONS

RW 801 – RW 826

EACH WAGON IS SUPPLIED WITH 10 WAY THROUGH CONTROL WIRING, CONNECTING 10 PIN JUMPER RECEPTACLE BOXES, POSITIONED AT THE HEADSTOCKS. ONE RED AND ONE BLUE RECEPTACLE BOX IS FITTED TO EACH HEADSTOCK.

AN AUXILIARY POWER SOCKET IS PROVIDED AT EACH END OF THE WAGON FOR PASSING A 110 VOLT 63 AMP A.C. POWER SUPPLY DOWN THE TRAIN. ADJACENT TO EACH OF THESE THERE IS AN ADDITIONAL SOCKET FOR 110 VOLT 16 AMP SINGLE PHASE POWER SUPPLY CONTROLLED BY AN M.C.B. RATED UP TO 16 AMPS.

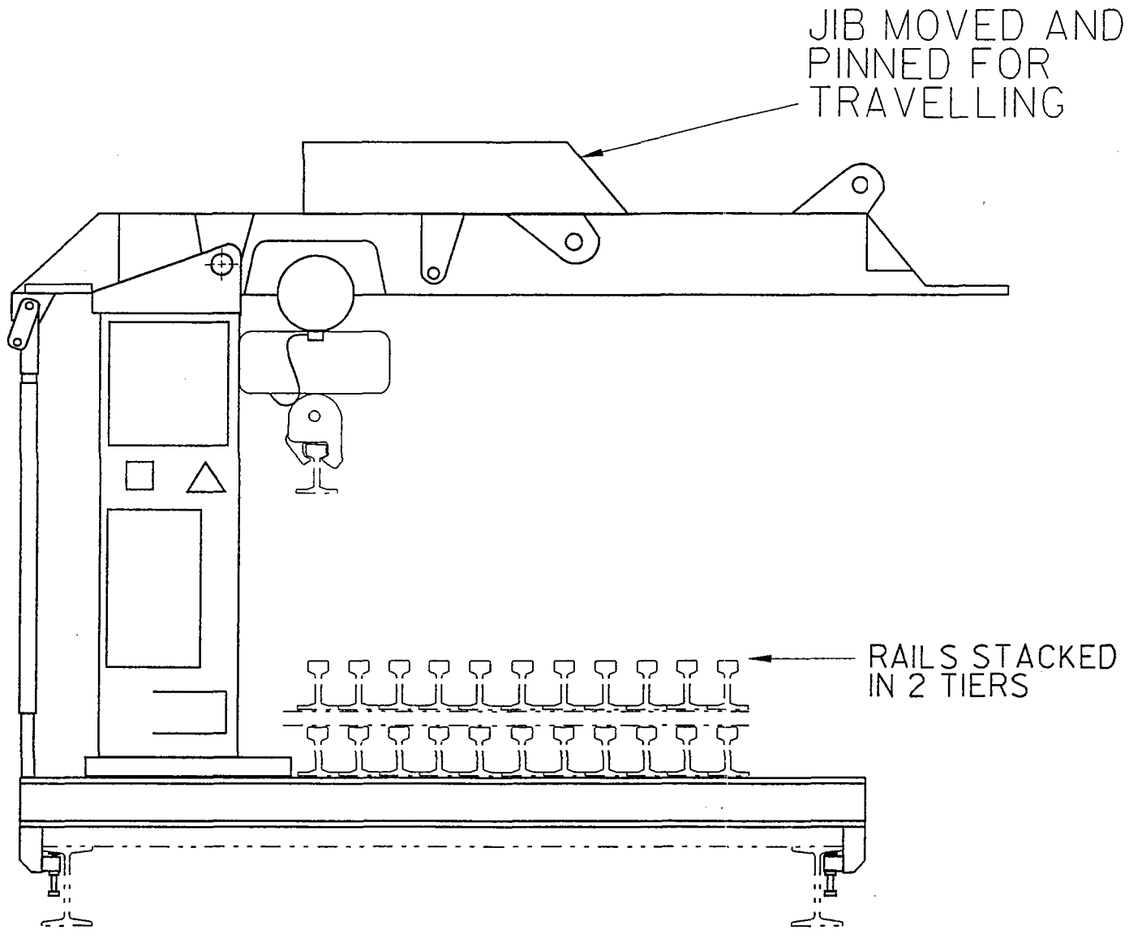
AUXILIARY POWER JUMPER CABLES SUITABLE FOR CONNECTING ADJOINING WAGONS ARE ALSO SUPPLIED.

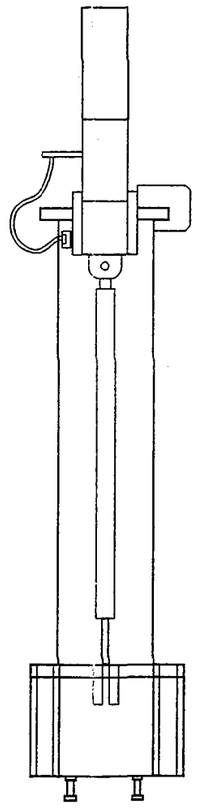
IN ADDITION EACH WAGON HAS AN INTEGRAL CIRCUIT FOR THE SUPPLY OF POWER TO ELK CRANES MOUNTED ON THE UNDERFRAME. THE CIRCUIT IS TERMINATED AT EACH SIDE OF THE WAGON WITH A 110 VOLT SOCKET OUTLET CONTROLLED BY AN M.C.B. RATED UP TO 32 AMPS.

SIDE STANCHIONS

EACH SIDE OF THE WAGON IS FITTED WITH SIDE STANCHIONS WHICH SHALL, IF REQUIRED, SUPPORT SIDE BOARDS FOR THE RETENTION OF THE LOAD. EACH STANCHION SHALL HAVE A SUITABLE BRACKET TO SUPPORT IT IN THE LOWERED POSITION.

2.5 TONNE ELK SIDE RAIL LOADER



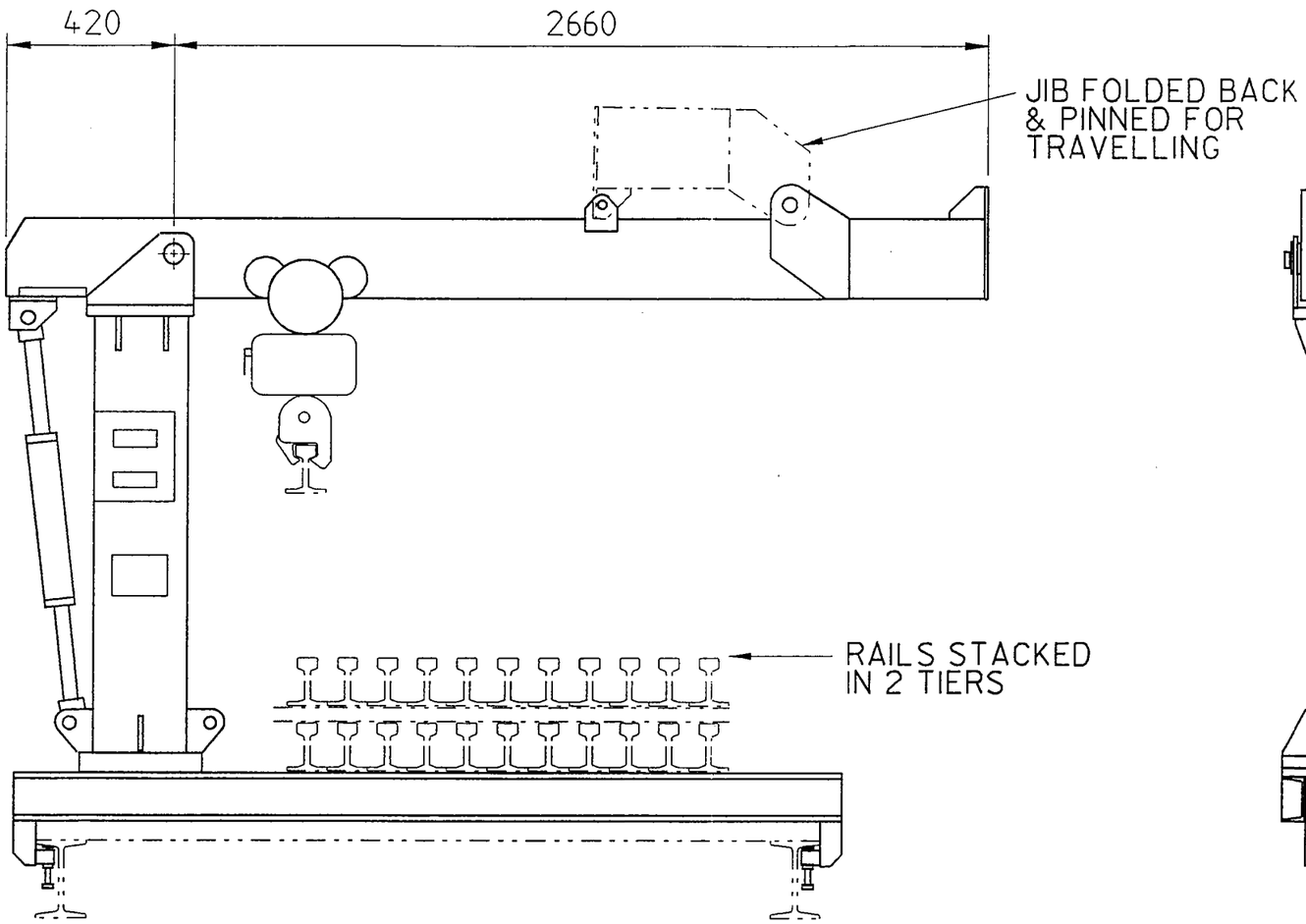


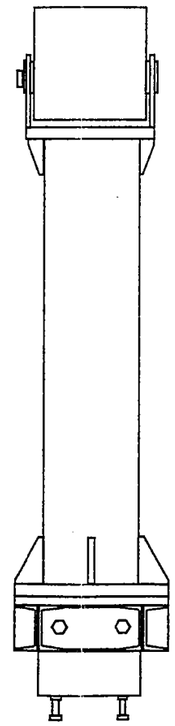
NO.RANGE: MOUNTED ON RW801 - RW803	23/11/93	LUL13c

2.5 TONNE WAGON MOUNTED ELK CRANES

TITLE	WAGON MOUNTED ELK CRANES
FUNCTION	TO UNLOAD OR LOAD 18.3M (60FT), OR SHORTER, LENGTHS OF RUNNING OR CONDUCTOR RAIL TO OR FROM THE SIDE OF THE TRACK CLOSE AND PARALLEL TO RUNNING RAILS
DELIVERY DATE – MANUFACTURERS NAME	1972 – 1980 ELK CRANE – K&M ENGINEERING LTD ROTARY CONVERTER – ELECTRO-DYNAMIC CONSTRUCTION LTD M A SET – ARCONTROL LTD
DESIGN LIFE EXPIRES	(TAKEN AT 30 YEARS) 2002 – 2010
MODIFICATION DETAILS	NONE RECORDED
LIMITATIONS IN OPERATION	CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS IN THEIR FULLY AND CORRECTLY STOWED CONDITION
SPECIAL FEATURES	THE ELK UNITS ARE MOUNTED ON NON–DEDICATED 20 TONNE RAIL WAGONS. TWO ELK CRANE UNITS, FITTED WITH ELECTRIC HOISTS, ARE MOUNTED ON EACH WAGON AND ARE CAPABLE OF BEING OPERATED SINGLY OR IN TANDEM. THE ELK UNITS MOUNTED ON RW 801 – RW 803 HAVE FIXED JIBS. THE ELK UNITS MOUNTED ON RW 804 EACH HAVE A JIB THAT CAN BE SLEWED THROUGH 90 DEGREES ALL UNITS CAN ONLY LOAD/UNLOAD TO ONE SIDE OF THE TRACK. A ROTARY CONVERTER OR M/A SET IS MOUNTED ON EACH WAGON TO PROVIDE THE ELK UNITS WITH A 110V AC 3 PHASE SUPPLY PRIMARY POWER SOURCE IS A BATTERY LOCOMOTIVE THE ELK UNITS ON RW804 CAN BE FED DIRECT FROM A 1985 BATTERY LOCOMOTIVE

2.5 TONNE ELK SIDE RAIL LOADER



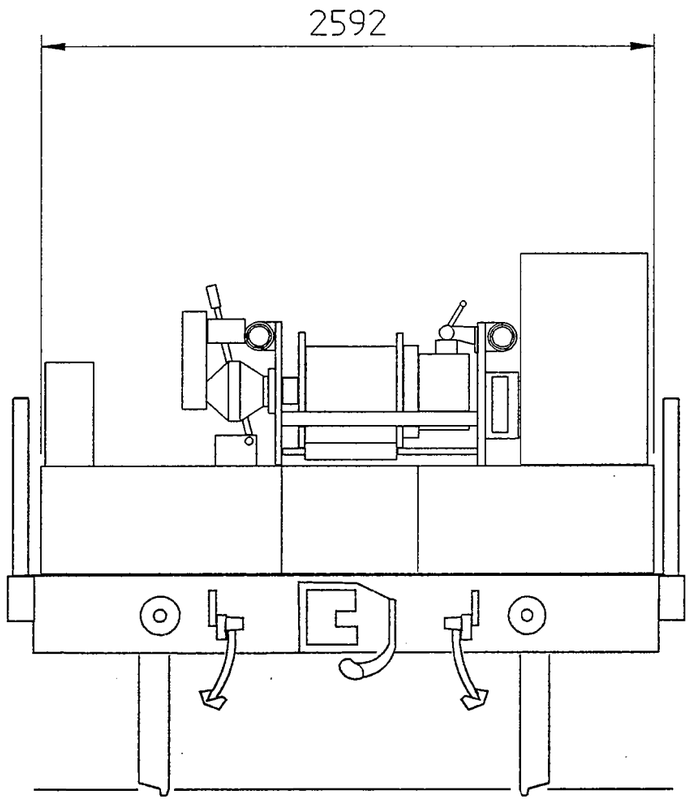


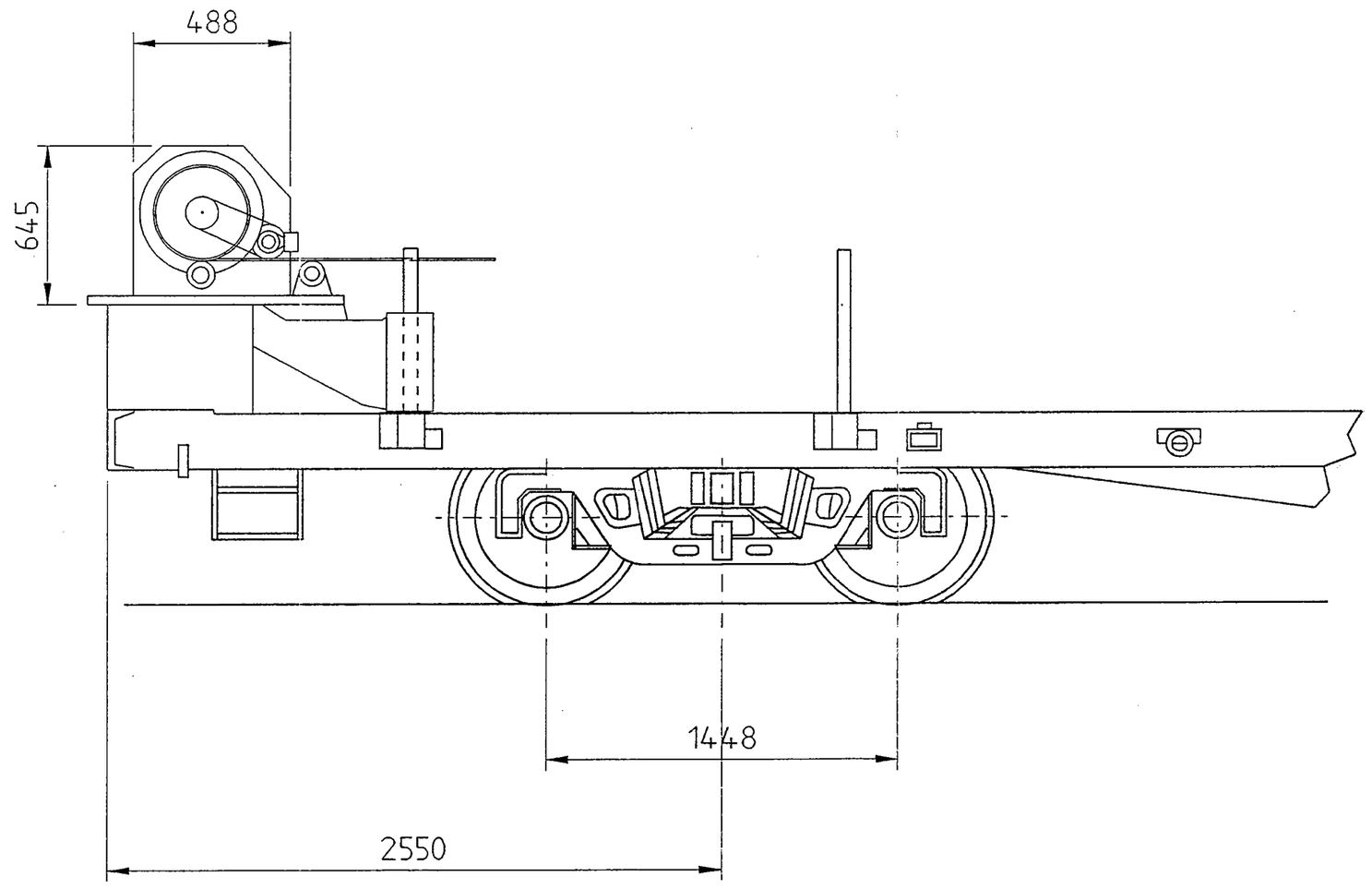
NO.RANGE: MOUNTED ON RW804	23/11/93	LUL13d

2.5 TONNE WAGON MOUNTED ELK CRANES

TITLE	WAGON MOUNTED ELK CRANES
FUNCTION	TO UNLOAD OR LOAD 18.3M (60FT), OR SHORTER, LENGTHS OF RUNNING OR CONDUCTOR RAIL TO OR FROM THE SIDE OF THE TRACK CLOSE AND PARALLEL TO RUNNING RAILS
DELIVERY DATE – MANUFACTURERS NAME	1972 – 1980 ELK CRANE – K&M ENGINEERING LTD ROTARY CONVERTER – ELECTRO-DYNAMIC CONSTRUCTION LTD M A SET – ARCONTROL LTD
DESIGN LIFE EXPIRES	(TAKEN AT 30 YEARS) 2002 – 2010
MODIFICATION DETAILS	NONE RECORDED
LIMITATIONS IN OPERATION	CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS IN THEIR FULLY AND CORRECTLY STOWED CONDITION
SPECIAL FEATURES	THE ELK UNITS ARE MOUNTED ON NON–DEDICATED 20 TONNE RAIL WAGONS. TWO ELK CRANE UNITS, FITTED WITH ELECTRIC HOISTS, ARE MOUNTED ON EACH WAGON AND ARE CAPABLE OF BEING OPERATED SINGLY OR IN TANDEM. THE ELK UNITS MOUNTED ON RW 801 – RW 803 HAVE FIXED JIBS. THE ELK UNITS MOUNTED ON RW 804 EACH HAVE A JIB THAT CAN BE SLEWED THROUGH 90 DEGREES ALL UNITS CAN ONLY LOAD/UNLOAD TO ONE SIDE OF THE TRACK. A ROTARY CONVERTER OR M/A SET IS MOUNTED ON EACH WAGON TO PROVIDE THE ELK UNITS WITH A 110V AC 3 PHASE SUPPLY PRIMARY POWER SOURCE IS A BATTERY LOCOMOTIVE THE ELK UNITS ON RW804 CAN BE FED DIRECT FROM A 1985 BATTERY LOCOMOTIVE

1.5 TONNE WINCH UNIT





NO.RANGE: MOUNTED ON RW818	23/11/93	LUL13e

1.5 TONNE WAGON MOUNTED RAIL WINCH

TITLE	1.5 TONNE WINCH AND TAIL ROLLER UNIT
FUNCTION	TO LOAD (RECOVER) 18.3M (60FT), OR SHORTER, LENGTHS OF RUNNING OR CONDUCTOR RAIL FROM TUBE OR SUB–SURFACE TUNNELS.
OPERATION DESCRIPTION	THE WINCH AND TAIL ROLLER UNIT ARE MOUNTED ON THE 'D' AND 'A' END RESPECTIVELY OF WAGON RW 818. THE WINCH IS FITTED WITH A WIRE ROPE WITH S.W.L = 2.14 TONNES (MIN. BREAKING LOAD 10.7 TONNES) AND A SPECIALLY DESIGNED RAIL ATTACHMENT SHACKLE. IN OPERATION THE WINCH ROPE IS MANUALLY UNWOUND FROM THE WINCH DRUM, OVER THE TAIL ROLLER UNIT, AND ATTACHED TO THE END OF A RAIL IN THE FOUR FOOT BEYOND THE 'A' END OF THE WAGON. THE WINCH IS THEN POWERED TO RECOVER THE RAIL. THE WINCH IS POWERED BY – 'BROOKS' 110V AC, 50HZ, 3 PHASE MOTOR PRIMARY POWER SOURCE: BATTERY 1985 BATTERY LOCOMOTIVE ONLY
DELIVERY DATE – MANUFACTURERS NAME	1990 GROSVENOR REEVE LTD
DESIGN LIFE EXPIRES	(TAKEN AT 15 YEARS) 2005
MODIFICATION DETAILS	MODIFIED MOUNTINGS FOLLOWING REMOVAL FROM FLAT WAGON TO MATCH WAGON (NOT DOCUMENTED)
LIMITATIONS IN OPERATION	CONFORM TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS. FULL ROUTE AVAILABILITY <u>MUST</u> ONLY WORK WHEN THE TRACTION CURRENT IS 'OFF'
SPECIAL FEATURES	THE MACHINE IS MADE UP OF THE FOLLOWING SEPARATE ITEMS: 1) ELECTRICALLY DRIVEN HYDRAULIC WINCH UNIT 2) TAIL ROLLER UNIT 3) 4 TRIANGULAR SECTION BOLSTERS THE WINCH UNIT IS CLAMPED OVER THE HEADSTOCK OF THE RAIL WAGON, AT THE END THAT IS COUPLED TO THE BATTERY LOCOMOTIVE. THE WINCH DRUM IS DRIVEN BY A HYDRAULIC MOTOR THROUGH A FRICTION CLUTCH AND A REDUCTION GEARBOX.

1.5 TONNE WAGON MOUNTED RAIL WINCH (C0NTINUED)

SPECIAL FEATURES CONTINUED

THE HYDRAULIC MOTOR IS POWERED BY AN ELECTRICALLY DRIVEN FIXED DISPLACEMENT PUMP, WITH A PRESSURE RELIEF VALVE TO LIMIT THE MAXIMUM PRESSURE OF THE OIL DELIVERED.

VARIOUS SAFETY FEATURES ARE INCORPORATED IN THE DESIGN TO PREVENT OVER TENSIONING OF THE ROPE DURING THE PULLING ON OPERATION.

THE TAIL ROLLER UNIT IS CLAMPED OVER THE OTHER HEADSTOCK OF THE RAIL WAGON WITH THE ROLLER OUT BOARD OF THE WAGON.

THE TRIANGULAR SECTION BOLSTERS ARE POSITIONED ALONG THE LENGTH OF THE WAGON DECK AND ARE LOCATED OVER THE STANCHION STOWAGE PLATES.

WINCH TEST LOADS – MEASURED IN TONNES WITH THE ROPE IN TENSION.

1) HYDRAULIC PRESSURE RELIEF VALVE SETTING = 1.4t
2) FRICTION CLUTCH SLIPPING = 1.58t
3) MOTOR STALL = 1.70t

ROPE DETAILS

MANUFACTURER: BRITISH ROPES
TYPE: ENDURANCE 35LS STEEL WIRE ROPE
CONSTRUCTION: 35 X 7 WSC

A MULTI–STRAND ROPE OF 35 STRANDS EACH COMPRISING OF 7 WIRES.

MINIMUM BREAKING LOAD	=	10.7t
SAFE WORKING LOAD	=	2.14t
PROOF LOAD TEST	=	4.28t

RAIL WEIGHTS

BS NO 95 RHB

RAIL LENGTH (M)	WEIGHT (KG)
18.3 (60FT)	860
13.7 (45FT)	665
9.1 (30FT)	430

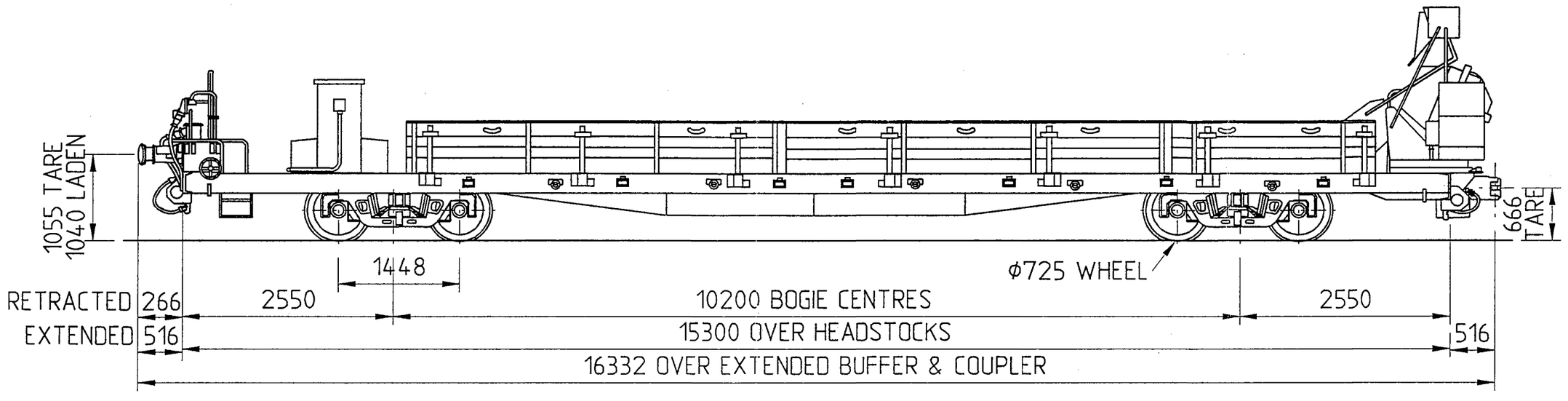
BS NO 113A

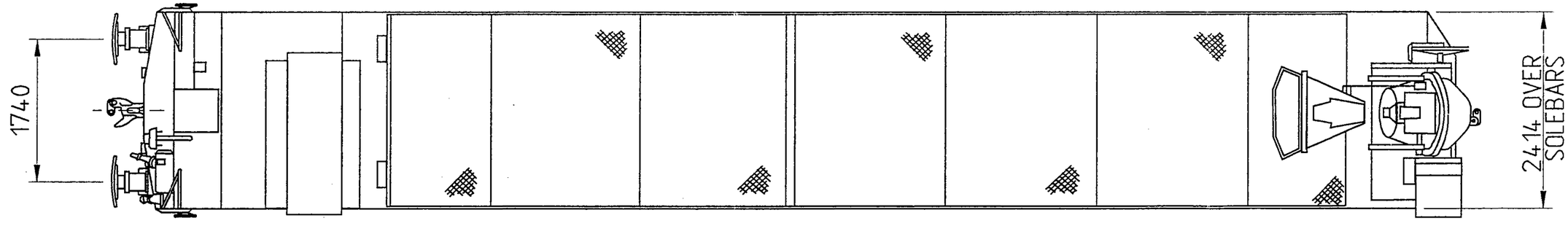
RAIL LENGTH (M)	WEIGHT (KG)
18.3 (60FT)	1030
13.7 (45FT)	770
9.1 (30FT)	515

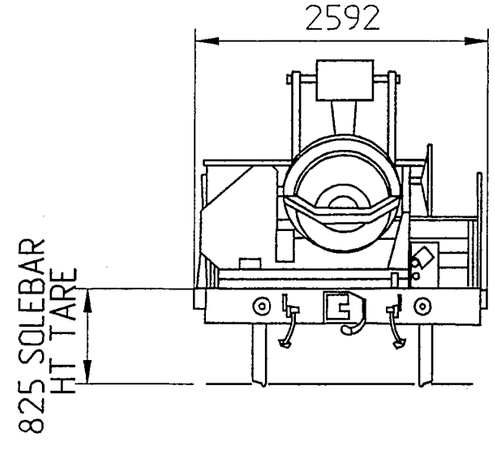
21 X 18.3M (60FT) BULL HEAD RAILS MAY BE CARRIED ON A 20t RAIL WAGON WITH THE SHORT RAIL LOADING EQUIPMENT.

17 X 18.3M (60FT) FLAT BOTTOM RAILS MAY BE CARRIED ON A 20t RAIL WAGON WITH THE SHORT RAIL LOADING EQUIPMENT.

CEMENT MIXER WAGON







NO.RANGE: CMW950 - CMW955	23/11/93	LUL14a

CEMENT MIXER/MATCH WAGONS

TITLE	CONCRETE MIXER AND 30 TONNE MATCH WAGONS
FUNCTION	TO CARRY AND MIX CONCRETE MAKING MATERIALS FOR USE DURING TUBE TUNNEL RECONDITIONING WORK SECONDARY FUNCTION TO CARRY AND MIX CONCRETE MAKING MATERIALS FOR USE IN INFRASTRUCTURE MAINTENANCE WORK ANCILLIARY FUNCTION ALTHOUGH ITS CAPACITY HAS BEEN REDUCED THE WAGON CAN STILL BE USED FOR GENERAL PURPOSE DUTIES
NUMBER RANGE	CMW 950 – CMW 955 MW 956 – MW 961
DELIVERY DATE – MANUFACTURERS NAME	1987 PROCOR CONCRETE MIXER – FREDERICK PARKER LTD 1981 M/A SET – A R CONTROL – 1981
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) 2027
MODIFICATION DETAILS	SEE APPENDIX ALSO: MODIFIED CHUTES
TARE WEIGHT	CONCRETE MIXER 20160 KG MATCH WAGON 17960 KG
LOAD CAPACITY	CONCRETE MIXER 16.6 CUBIC METRES MATCH WAGON 19.5 CUBIC METRES
BRAKING SYSTEM	AIR BRAKED DAVIES AND METCALFE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE

CEMENT MIXER/MATCH WAGONS (CONTINUED)

COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE LOW END 26"/666 mm HIGH END 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		ROLLER BEARING TIMKEN SP120
LIMITATIONS IN OPERATION		IN ITS FULLY AND CORRECTLY STOWED CONDITION THE CONCRETE MIXER MOUNTED ON THE WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY MUST ONLY WORK WHEN TRACTION CURRENT IS 'OFF'

SPECIAL FEATURES

ELECTRICS

THROUGH ELECTRICS ARE PROVIDED ON BOTH WAGONS

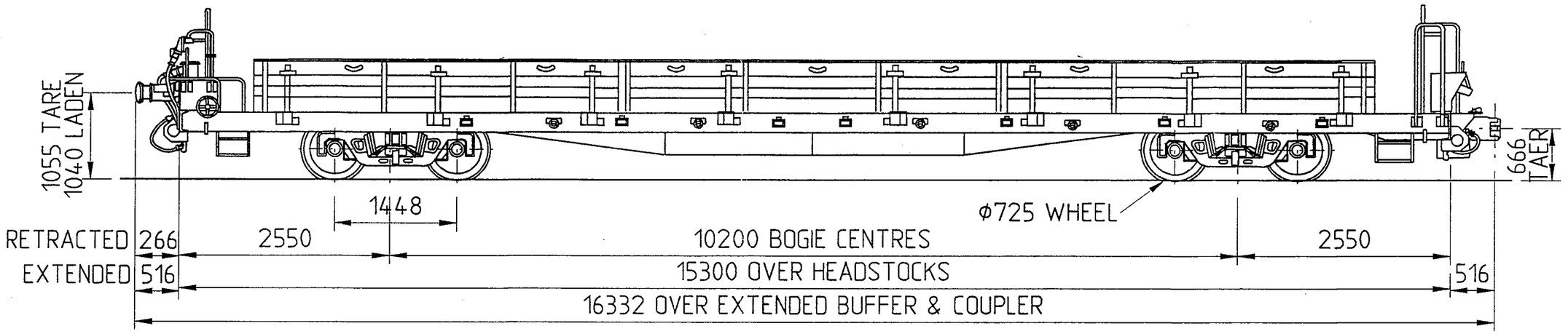
MIXER WAGON

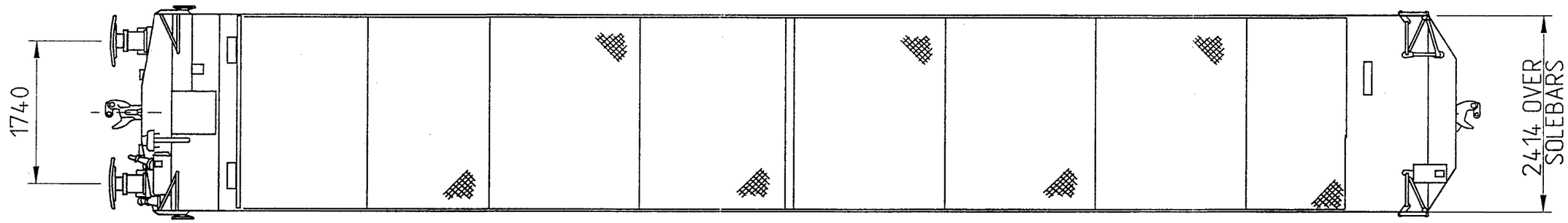
TWO THROUGH JUMPER RECEPTACLES – RED
TWO THROUGH JUMPER RECEPTACLES – BLUE
ONE 320V 40A DC SUPPLY "WHITE" JUMPER RECEPTACLE
TWO AC AUX POWER SOCKETS WITH ONE 110V 63A 3 PHASE RECEPTACLE AND ONE 110V 16A SINGLE PHASE RECEPTACLE
ONE DUMMY JUMPER SOCKET WITH PROVING CIRCUIT
ONE THREE PHASE CONTROL UNIT

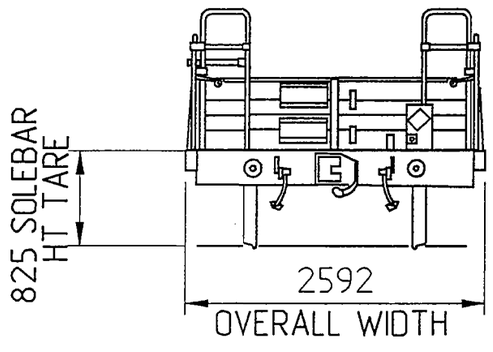
MATCH WAGON

TWO THROUGH JUMPER RECEPTACLES – RED
TWO THROUGH JUMPER RECEPTACLES – BLUE,
TWO AC AUX POWER SOCKET WITH ONE 110V 63A 3 PHASE RECEPTACLE AND ONE 110V 16A SINGLE PHASE RECEPTACLE
ONE DUMMY JUMPER SOCKET WITH PROVING CIRCUIT

MATCH WAGON







NO.RANGE: MW956 - MW961	23/11/93	LUL14b

CEMENT MIXER/MATCH WAGONS

TITLE	CONCRETE MIXER AND 30 TONNE MATCH WAGONS
FUNCTION	TO CARRY AND MIX CONCRETE MAKING MATERIALS FOR USE DURING TUBE TUNNEL RECONDITIONING WORK SECONDARY FUNCTION TO CARRY AND MIX CONCRETE MAKING MATERIALS FOR USE IN INFRASTRUCTURE MAINTENANCE WORK ANCILLIARY FUNCTION ALTHOUGH ITS CAPACITY HAS BEEN REDUCED THE WAGON CAN STILL BE USED FOR GENERAL PURPOSE DUTIES
NUMBER RANGE	CMW 950 – CMW 955 MW 956 – MW 961
DELIVERY DATE – MANUFACTURERS NAME	1987 PROCOR CONCRETE MIXER – FREDERICK PARKER LTD 1981 M/A SET – A R CONTROL – 1981
DESIGN LIFE EXPIRES	(TAKEN AT 40 YEARS) 2027
MODIFICATION DETAILS	SEE APPENDIX ALSO: MODIFIED CHUTES
TARE WEIGHT	CONCRETE MIXER 20160 KG MATCH WAGON 17960 KG
LOAD CAPACITY	CONCRETE MIXER 16.6 CUBIC METRES MATCH WAGON 19.5 CUBIC METRES
BRAKING SYSTEM	AIR BRAKED DAVIES AND METCALFE AUTOMATIC EMPTY/LOAD VALVE SCREW PARKING BRAKE

CEMENT MIXER/MATCH WAGONS (CONTINUED)

COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE LOW END 26"/666 mm HIGH END 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		ROLLER BEARING TIMKEN SP120
LIMITATIONS IN OPERATION		IN ITS FULLY AND CORRECTLY STOWED CONDITION THE CONCRETE MIXER MOUNTED ON THE WAGON CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY MUST ONLY WORK WHEN TRACTION CURRENT IS 'OFF'

SPECIAL FEATURES

ELECTRICS

THROUGH ELECTRICS ARE PROVIDED ON BOTH WAGONS

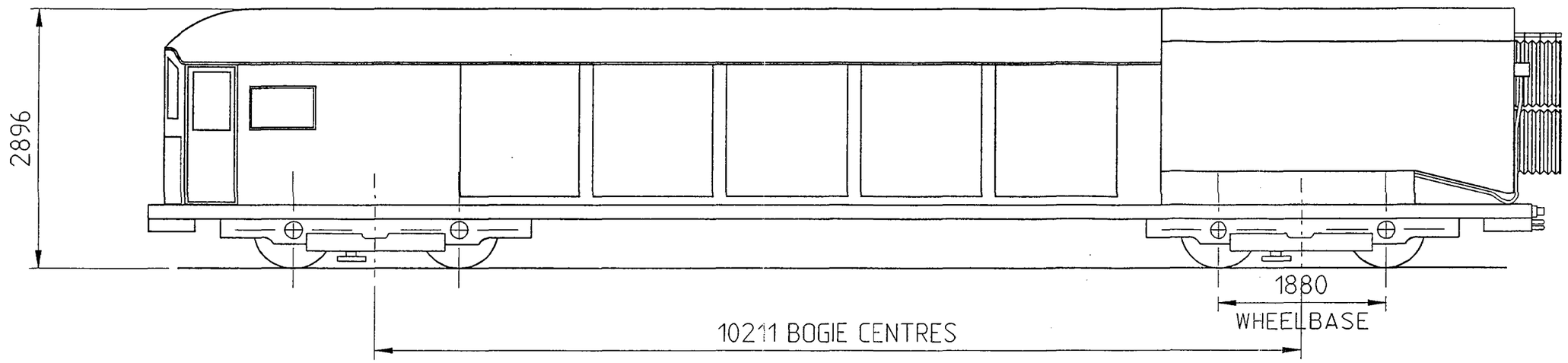
MIXER WAGON

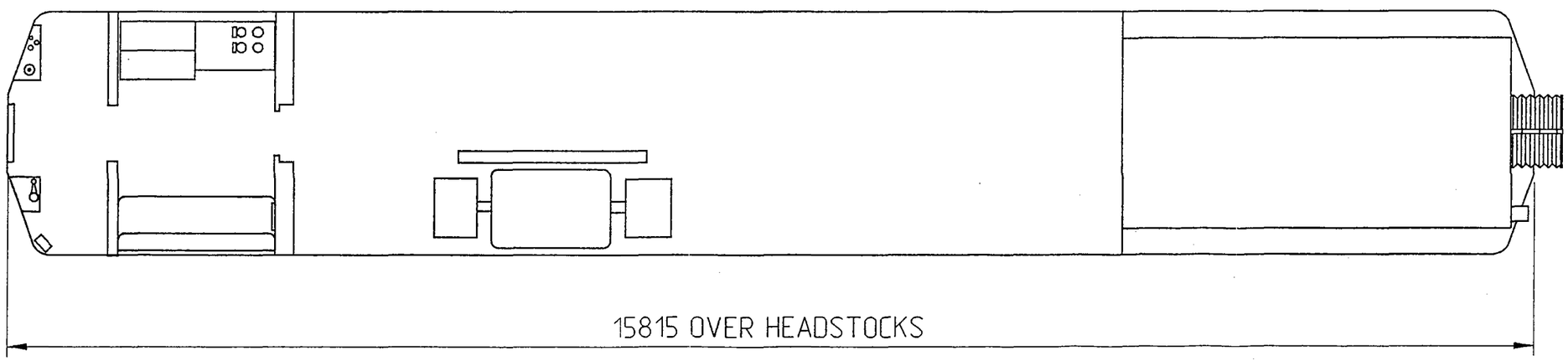
TWO THROUGH JUMPER RECEPTACLES – RED
TWO THROUGH JUMPER RECEPTACLES – BLUE
ONE 320V 40A DC SUPPLY "WHITE" JUMPER RECEPTACLE
TWO AC AUX POWER SOCKETS WITH ONE 110V 63A 3 PHASE RECEPTACLE AND ONE 110V 16A SINGLE PHASE RECEPTACLE
ONE DUMMY JUMPER SOCKET WITH PROVING CIRCUIT
ONE THREE PHASE CONTROL UNIT

MATCH WAGON

TWO THROUGH JUMPER RECEPTACLES – RED
TWO THROUGH JUMPER RECEPTACLES – BLUE,
TWO AC AUX POWER SOCKET WITH ONE 11OV 63A 3 PHASE RECEPTACLE AND ONE 110V 16A SINGLE PHASE RECEPTACLE
ONE DUMMY JUMPER SOCKET WITH PROVING CIRCUIT

TUNNEL CLEANING TRAIN CARS 1 & 5 (MOTOR CARS)





NO.RANGE: TCC1, TCC5	23/11/93	LUL15a

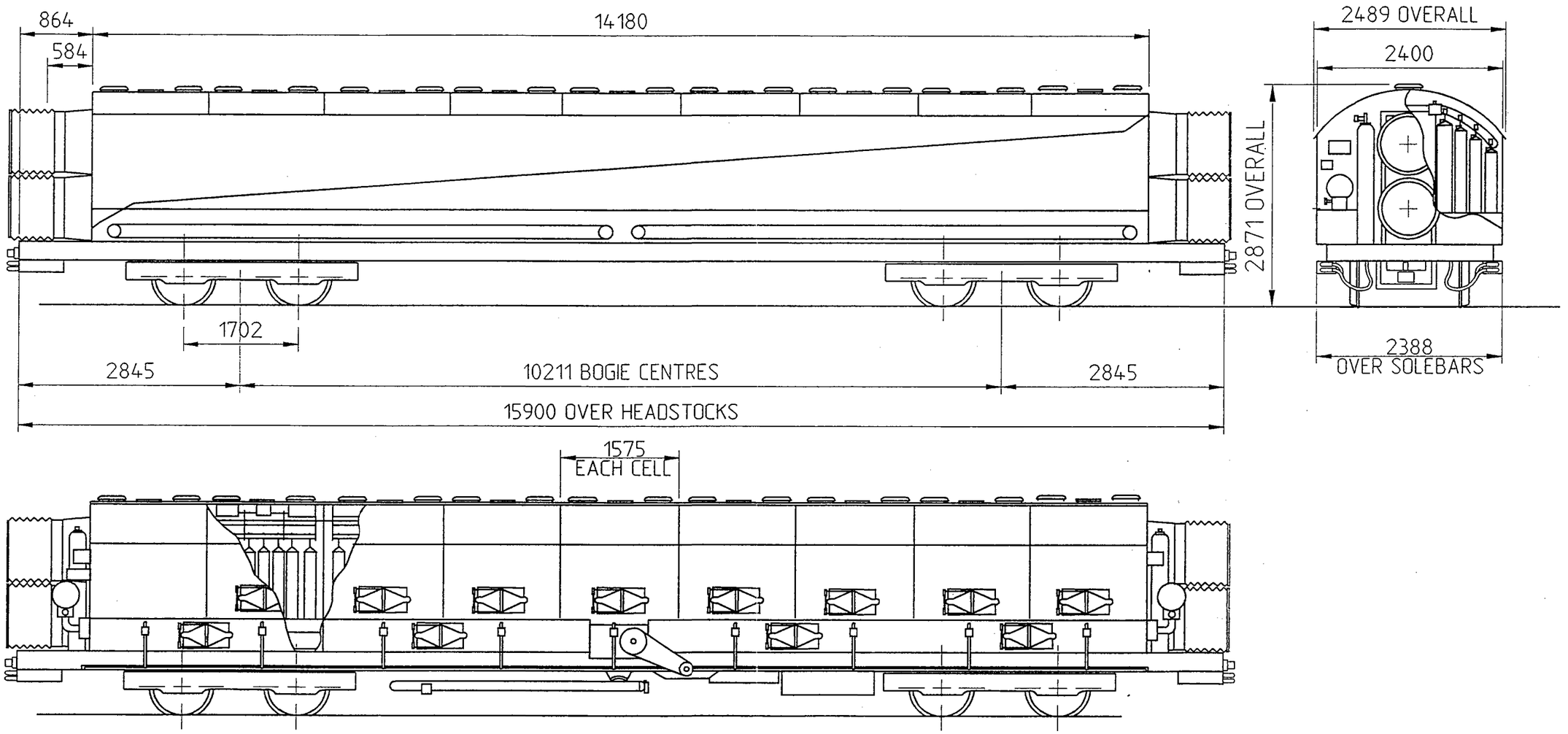
TUNNEL CLEANING TRAIN

TITLE		TUNNEL CLEANING TRAIN
FUNCTION		TO REMOVE TUNNEL DUST AND REFUSE FROM TUBE TUNNELS INCLUDING THE REMOVAL OF DUST FROM CABLE RUNS, AND TO REMOVE DUST AND REFUSE FROM STATION PLATFORM AREAS IN SUB-SURFACE TUNNELS
NUMBER RANGE		TCC 1 – TCC 5
DELIVERY DATE – MANUFACTURERS NAME		TCC 2 – TCC4 LONDON UNDERGROUND LTD 1978 TCC 1, TCC 5 EX 1938 STOCK MOTOR CARS
DESIGN LIFE EXPIRES		TCC1, TCC5 – 1998 TCC2 – TCC4 – 2000
MODIFICATION DETAILS		1) NEGATIVE SHOEGEAR ARC SHIELDING 2) MODIFIED SPEED CONTROL 3) MODIFIED SPEED HYDRAULIC CIRCUIT 4) NYLON BRUSHES ON CLEANER CAR TO CONTAIN AIRBLASTS 5) 110V VACUUM CLEANER & TRANSFORMER SOCKETS 6) MODIFIED FIRE/EXPLOSION PREVENTION SYSTEM 7) MODIFIED HEAD LIGHTS (PROPOSED)
GROSS WEIGHT		173 TONNES
BRAKING SYSTEM		AIR BRAKED
COUPLINGS	TYPE HEIGHT FROM RAIL	WEDGE LOCK 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		SERVICE SPEED 0.5 TO 6 MPH (0.8 TO 10 kph) MAX 40 MPH (64 kph)
AXLE BOX TYPE		ROLLER TCC1, TCC5 TIMKEN TCC2–4 HOFFMAN SKF

TUNNEL CLEANING TRAIN (CONTINUED)

LIMITATIONS IN OPERATION	CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY CONFORMS TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' CAN ONLY WORK WHEN TRACTION CURRENT IS 'ON' CAN ONLY WORK IN A POSSESSION. AN ENGINEER'S CURRENT AREA OR AS 'LAST TRAIN' RESTRICTED ALL TUNNEL SIDINGS SEE SECTION 1B LONDON UNDERGROUND RULE BOOK – REGULATION C1 (E)
SPECIAL FEATURES	THE TRAIN IS COMPOSED OF FIVE CARS. TCC1 CONTAINS DRIVING AND OPERATING CONTROLS, SUCTION FAN AND HYDRAULIC DRIVE POWER UNIT; TCC2 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT; TCC3 CONTAINS HEAVY REFUSE COMPARTMENTS AND BLOWING AND SUCTION NOZZLES; TCC4 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT AND TCC5 CONTROLS SUCTIONS FAN AND M/A SET MOTIVE POWER TRAVELLING: ELECTRIC TRACTION MOTORS MOTIVE POWER WORKING: HYDRAULIC DRIVE MOTORS

TUNNEL CLEANING TRAIN, CARS 2 & 4 (FILTER CARS)



NO.RANGE: TCC2, TCC4	23/11/93	LUL15b

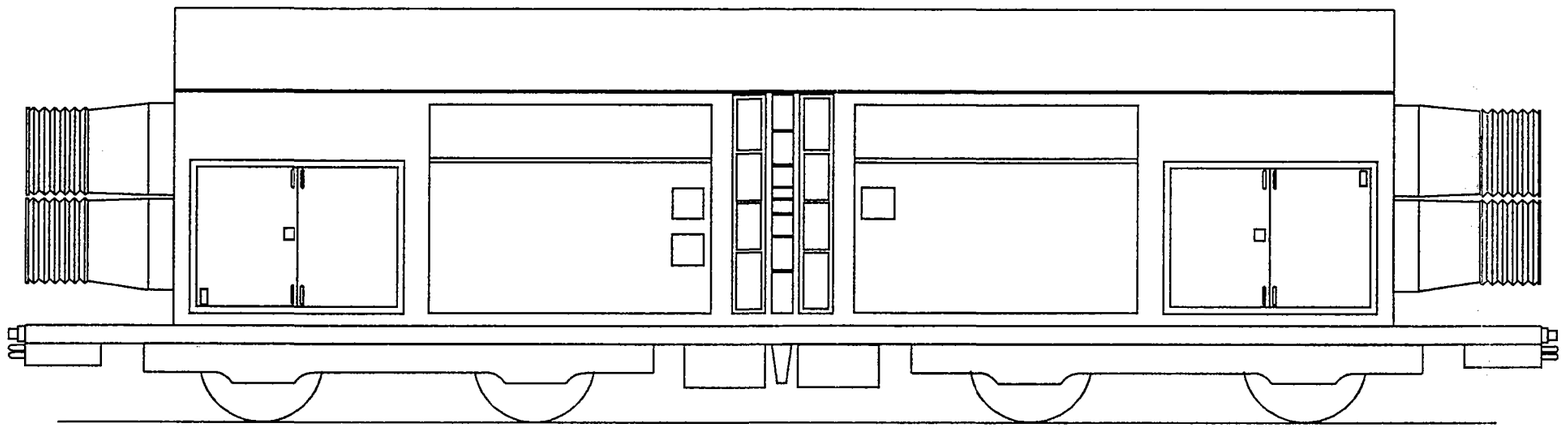
TUNNEL CLEANING TRAIN

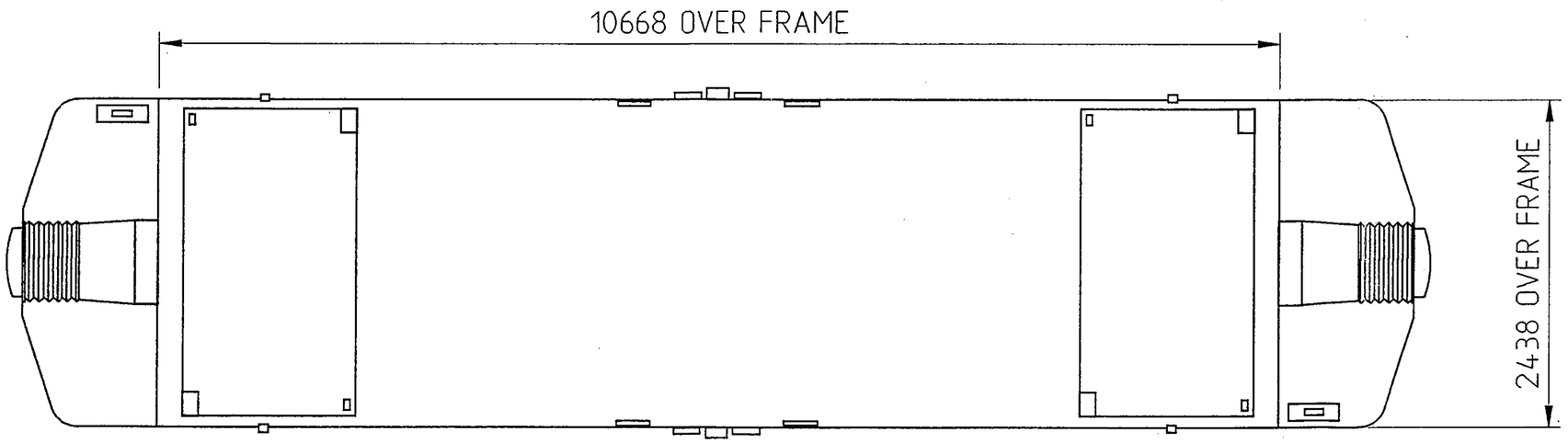
TITLE		TUNNEL CLEANING TRAIN
FUNCTION		TO REMOVE TUNNEL DUST AND REFUSE FROM TUBE TUNNELS INCLUDING THE REMOVAL OF DUST FROM CABLE RUNS, AND TO REMOVE DUST AND REFUSE FROM STATION PLATFORM AREAS IN SUB-SURFACE TUNNELS
NUMBER RANGE		TCC 1 – TCC 5
DELIVERY DATE – MANUFACTURERS NAME		TCC 2 – TCC4 LONDON UNDERGROUND LTD 1978 TCC 1, TCC 5 EX 1938 STOCK MOTOR CARS
DESIGN LIFE EXPIRES		TCC1, TCC5 – 1998 TCC2 – TCC4 – 2000
MODIFICATION DETAILS		1) NEGATIVE SHOEGEAR ARC SHIELDING 2) MODIFIED SPEED CONTROL 3) MODIFIED SPEED HYDRAULIC CIRCUIT 4) NYLON BRUSHES ON CLEANER CAR TO CONTAIN AIRBLASTS 5) 110V VACUUM CLEANER & TRANSFORMER SOCKETS 6) MODIFIED FIRE/EXPLOSION PREVENTION SYSTEM 7) MODIFIED HEAD LIGHTS (PROPOSED)
GROSS WEIGHT		173 TONNES
BRAKING SYSTEM		AIR BRAKED
COUPLINGS	TYPE HEIGHT FROM RAIL	WEDGE LOCK 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		SERVICE SPEED 0.5 TO 6 MPH (0.8 TO 10 kph) MAX 40 MPH (64 kph)
AXLE BOX TYPE		ROLLER TCC1, TCC5 TIMKEN TCC2–4 HOFFMAN SKF

TUNNEL CLEANING TRAIN (CONTINUED)

LIMITATIONS IN OPERATION	CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY CONFORMS TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' CAN ONLY WORK WHEN TRACTION CURRENT IS 'ON' CAN ONLY WORK IN A POSSESSION. AN ENGINEER'S CURRENT AREA OR AS 'LAST TRAIN' RESTRICTED ALL TUNNEL SIDINGS SEE SECTION 1B LONDON UNDERGROUND RULE BOOK – REGULATION C1 (E)
SPECIAL FEATURES	THE TRAIN IS COMPOSED OF FIVE CARS. TCC1 CONTAINS DRIVING AND OPERATING CONTROLS, SUCTION FAN AND HYDRAULIC DRIVE POWER UNIT; TCC2 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT; TCC3 CONTAINS HEAVY REFUSE COMPARTMENTS AND BLOWING AND SUCTION NOZZLES; TCC4 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT AND TCC5 CONTROLS SUCTIONS FAN AND M/A SET MOTIVE POWER TRAVELLING: ELECTRIC TRACTION MOTORS MOTIVE POWER WORKING: HYDRAULIC DRIVE MOTORS

TUNNEL CLEANING TRAIN CAR 3 (NOZZLE CAR)





NO.RANGE: TCC3	23/11/93	LUL15c

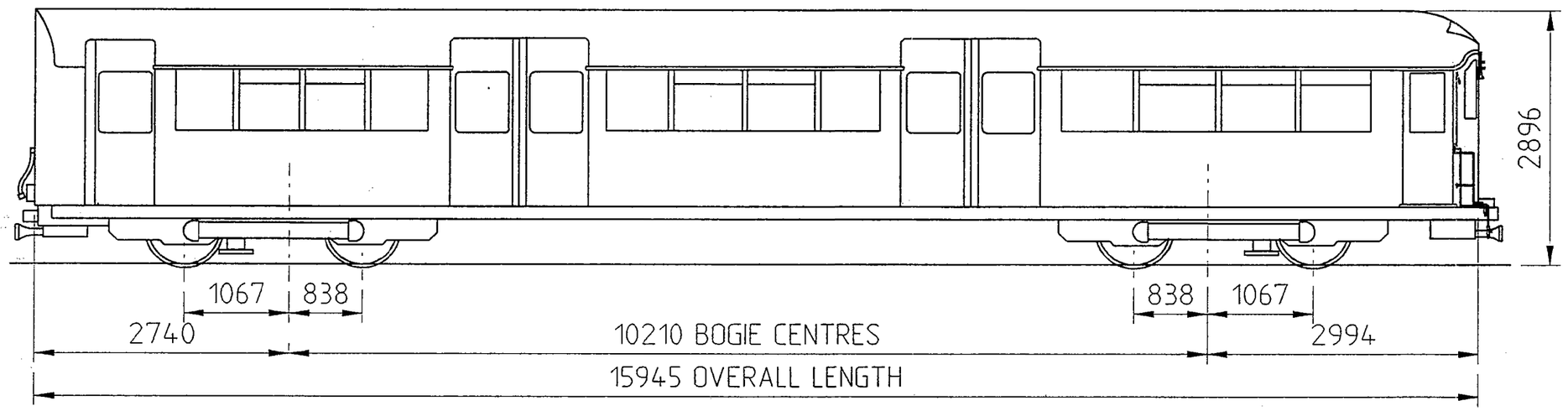
TUNNEL CLEANING TRAIN

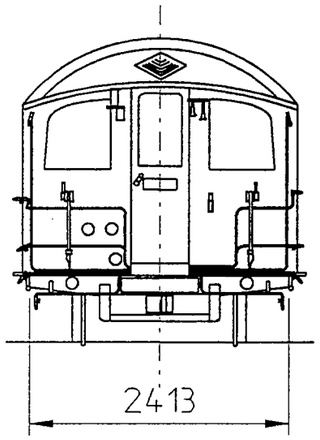
TITLE	TUNNEL CLEANING TRAIN
FUNCTION	TO REMOVE TUNNEL DUST AND REFUSE FROM TUBE TUNNELS INCLUDING THE REMOVAL OF DUST FROM CABLE RUNS, AND TO REMOVE DUST AND REFUSE FROM STATION PLATFORM AREAS IN SUB-SURFACE TUNNELS
NUMBER RANGE	TCC 1 – TCC 5
DELIVERY DATE – MANUFACTURERS NAME	TCC 2 – TCC4 LONDON UNDERGROUND LTD 1978 TCC 1, TCC 5 EX 1938 STOCK MOTOR CARS
DESIGN LIFE EXPIRES	TCC1, TCC5 – 1998 TCC2 – TCC4 – 2000
MODIFICATION DETAILS	1) NEGATIVE SHOEGEAR ARC SHIELDING 2) MODIFIED SPEED CONTROL 3) MODIFIED SPEED HYDRAULIC CIRCUIT 4) NYLON BRUSHES ON CLEANER CAR TO CONTAIN AIRBLASTS 5) 110V VACUUM CLEANER & TRANSFORMER SOCKETS 6) MODIFIED FIRE/EXPLOSION PREVENTION SYSTEM 7) MODIFIED HEAD LIGHTS (PROPOSED)
GROSS WEIGHT	173 TONNES
BRAKING SYSTEM	AIR BRAKED
COUPLINGS TYPE HEIGHT FROM RAIL	WEDGE LOCK 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED	SERVICE SPEED 0.5 TO 6 MPH (0.8 TO 10 kph) MAX 40 MPH (64 kph)
AXLE BOX TYPE	ROLLER TCC1, TCC5 TIMKEN TCC2–4 HOFFMAN SKF

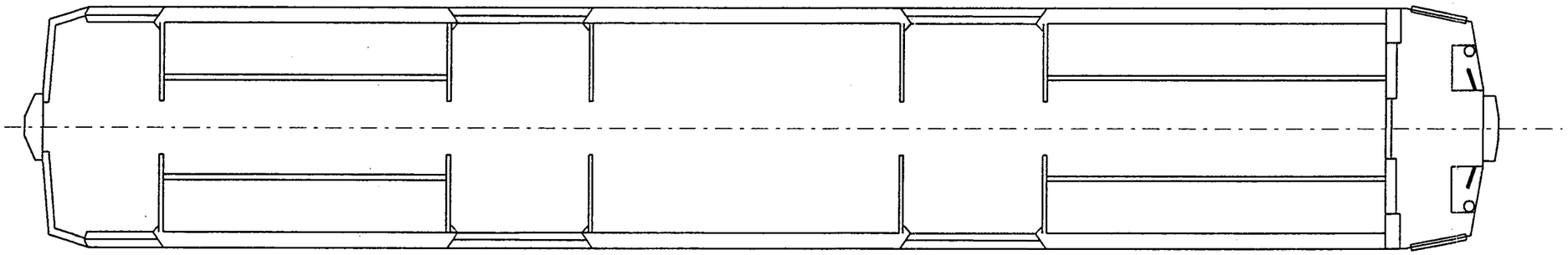
TUNNEL CLEANING TRAIN (CONTINUED)

LIMITATIONS IN OPERATION	CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY CONFORMS TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' CAN ONLY WORK WHEN TRACTION CURRENT IS 'ON' CAN ONLY WORK IN A POSSESSION. AN ENGINEER'S CURRENT AREA OR AS 'LAST TRAIN' RESTRICTED ALL TUNNEL SIDINGS SEE SECTION 1B LONDON UNDERGROUND RULE BOOK – REGULATION C1 (E)
SPECIAL FEATURES	THE TRAIN IS COMPOSED OF FIVE CARS. TCC1 CONTAINS DRIVING AND OPERATING CONTROLS, SUCTION FAN AND HYDRAULIC DRIVE POWER UNIT; TCC2 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT; TCC3 CONTAINS HEAVY REFUSE COMPARTMENTS AND BLOWING AND SUCTION NOZZLES; TCC4 CONTAINS DUST FILTRATION AND DISCHARGE EQUIPMENT AND TCC5 CONTROLS SUCTIONS FAN AND M/A SET MOTIVE POWER TRAVELLING: ELECTRIC TRACTION MOTORS MOTIVE POWER WORKING: HYDRAULIC DRIVE MOTORS

WEEDKILLING TRAIN







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NO.RANGE: L150, L151	23/11/93	LUL16

WEEDKILLING TRAIN

TITLE		WEEDKILLING TRAIN
FUNCTION		TO SPRAY WEEDKILLING CHEMICALS ONTO THE FOUR-FOOT, CESS AND ONTO EMBANKMENTS BEYOND THE CABLE RUNS OF RUNNING LINES TO SPRAY WEEDKILLING CHEMICALS ONTO SIDINGS AND DEPOT TRACK
NUMBER RANGE		L 150 – L 151
DELIVERY DATE – MANUFACTURERS NAME		TWO CONVERTED 1938 BALLAST MOTOR CARS – CONVERTED 1986. WEEDKILLING EQUIPMENT CHIPMAN LTD
DESIGN LIFE EXPIRES		1997
MODIFICATION DETAILS		1) FALSE FLOOR 2) 50V SUPPLY LABELS 3) WIRING OF HEADLIGHTS 4) PIM (SPEEDO) CONNECTIONS 5) WEEDKILLING TRAIN STABLING SITE 6) RADAR UNIT 7) WIRING MODS. TO STORAGE UNIT 8) WINDSCREEN WASHER SYSTEM 9) VENTILATOR 10) DRAIN POINTS IN CAR L.150 11) ROUTE INFORMATION HOLDER 12) ISOLATING SWITCH FOR 50V D.C. SUPPLY 13) DRAINS CUT-OUTS IN PUMP FRAME 14) INSTALLATION OF 110V WARNING LAMP 15) OPERATORS SEAT 16) CHEMICAL STORE DOOR RAMP 17) CHEMICAL STORE WIRE SUPPORT BRACKET 18) CHEMICAL STORE SILL RAMP 19) ACCESS TO WEEDKILLING TRAIN
GROSS WEIGHT		65 TONS APPROXIMATELY
BRAKING SYSTEM		AIR BRAKED
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		MAX 40MPH (64 kph)
AXLE BOX TYPE		ROLLER HOFFMAN/SKF

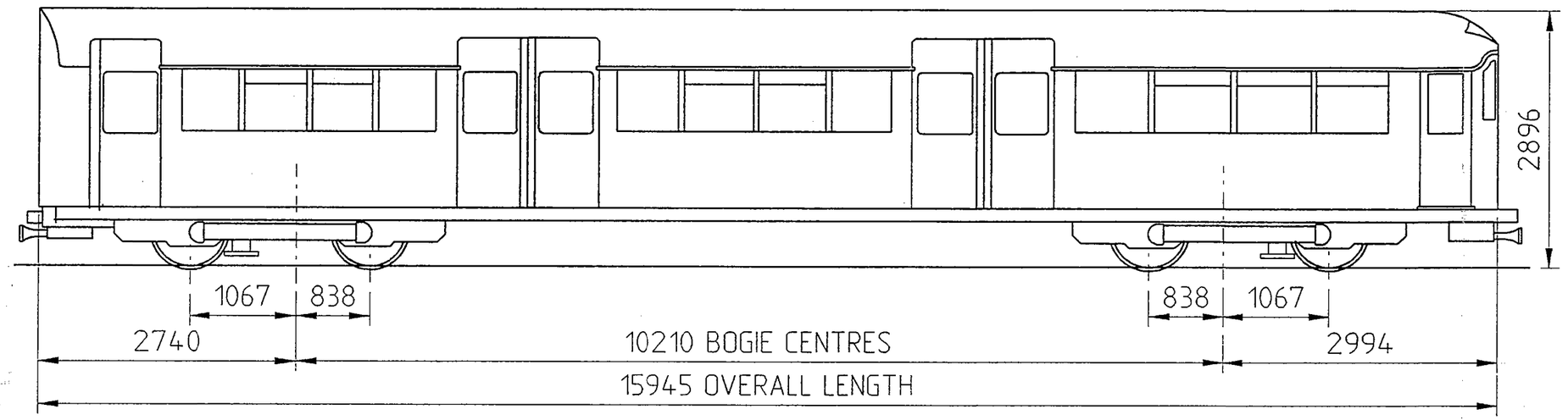
[redacted]

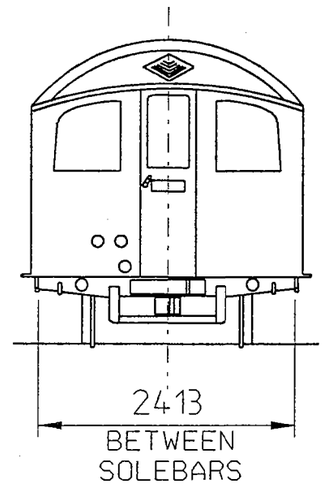
WEEDKILLING TRAIN (CONTINUED)

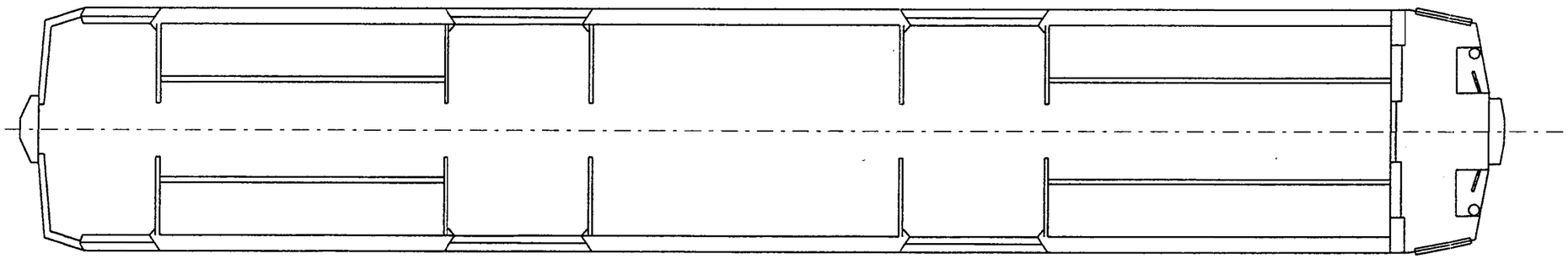
LIMITATIONS IN OPERATION	CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY CONFORMS TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' CAN ONLY WORK WHEN TRACTION CURRENT IS 'ON' THE CHEMICAL SPRAY EQUIPMENT ON THIS TRAIN MUST ONLY BE OPERATED BY STAFF HOLDING A 'CERTIFICATE OF COMPETENCE' AS A SPRAY TRAIN OPERATOR, ISSUED BY THE NATIONAL PROFICIENCY TESTS COUNCIL FOR AGRICULTURE AND HORTICULTURE
SPECIAL FEATURES	CAR L150 CONTAINS CHEMICAL STORAGE TANKS, CHEMICAL RING MAIN PUMPS, CHEMICAL WATER PUMPS, CHEMICAL WATER PUMPS, M/A SET AND DRIVING AND OPERATING CONTROLS. CAR 151 CONTAINS WATER STORAGE TANKS, CHEMICAL METERING PUMPS AND DRIVING AND OPERATING CONTROLS. A CHEMICAL/WATER MIXTURE IS ALWAYS SPRAYED FROM THE REAR OF THE TRAIN IN DIRECTION OF TRAVEL. MAXIMUM WIDTH OF SPRAY CURTAIN: 5M EITHER SIDE OF CENTRELINE OF TRACK ON WHICH THE TRAIN IS TRAVELLING.

[redacted]

GAUGING TRAIN PILOT CARS







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NO.RANGE: L146, L147	23/11/93	LULI7a

GAUGING TRAIN

TITLE		GAUGING CAR AND PILOT MOTOR CARS
FUNCTION		GAUGING THE MEASUREMENT OF RESTRICTED CLEARANCE OF TUNNEL SECTIONS TO CHECK ANY OBSTRUCTIONS THAT WOULD FOUL STRUCTURE GAUGE. THESE INCLUDE: SIGNAL EQUIPMENT TUNNEL SEGMENTS NOSING STONES CONCRETE WORK CABLE WORK NOISE REDUCTION EQUIPMENT
NUMBER RANGE		GAUGE CAR G663 PILOT CAR L 146 – L 147
DELIVERY DATE – MANUFACTURERS NAME		GAUGE CAR BIRMINGHAM RC & W LTD 1931 CONVERTED 1963 PILOT CAR METRO–CAMMELL 1938
DESIGN LIFE EXPIRES		L.146 – L.147 2000 G.663 – 1993
MODIFICATION DETAILS		NONE RECORDED
GROSS WEIGHT		PILOT CAR 28 TON GAUGE CAR 16 TON
BRAKING SYSTEM		AIR BRAKED
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD COUPLERS 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		ROLLER HOFFMAN/SKF

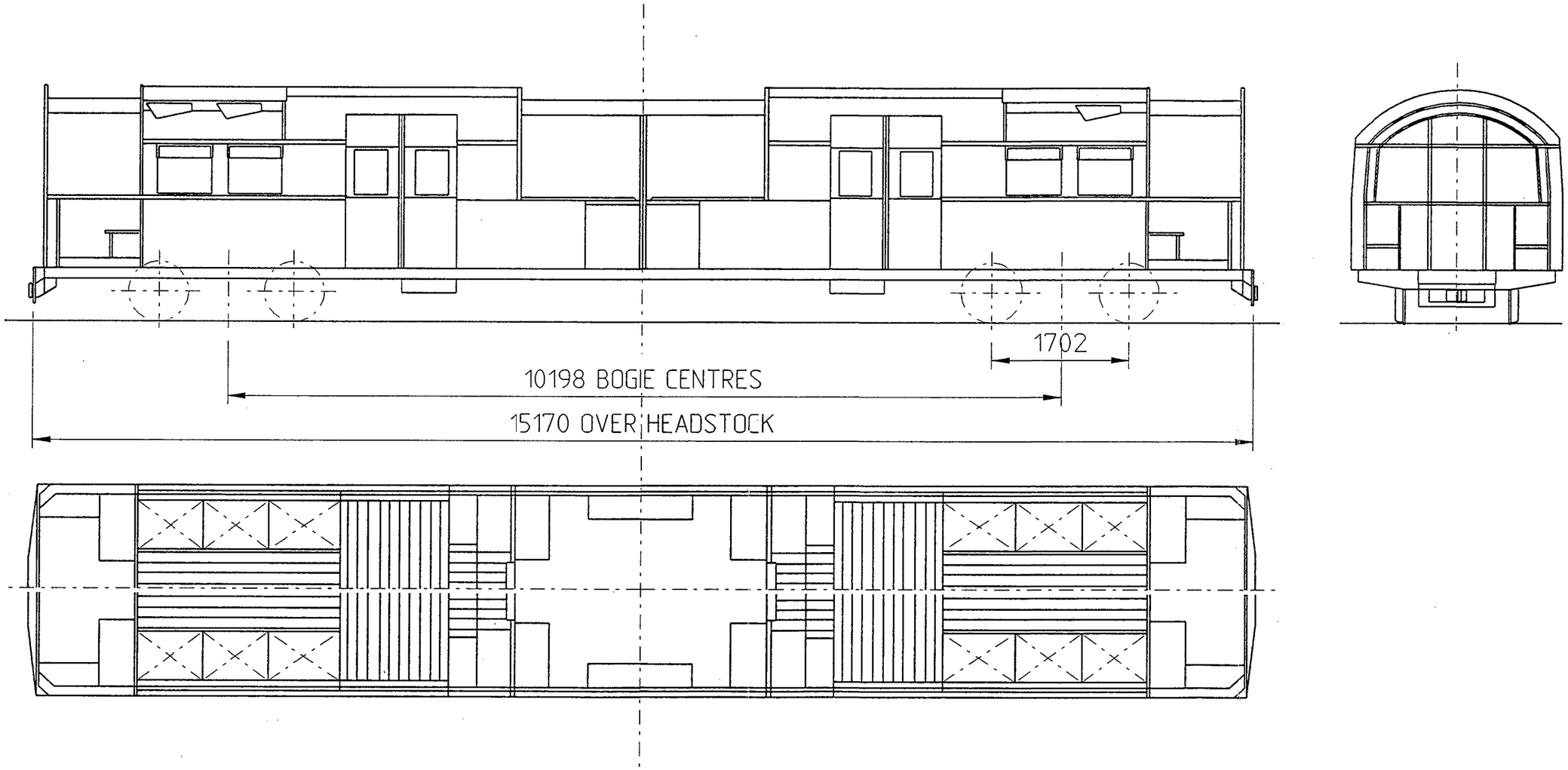
[redacted]

GAUGING TRAIN (CONTINUED)

LIMITATIONS IN OPERATIONS	CONFORMS TO LUL TUBE VEHICLES LOAD GAUGE EXCEPT GAUGE CAR G663 RESTRICTED CENTRAL LINE – WHITE CITY (INCLUDING DEPOT) TO LIVERPOOL STREET WHEN WORKING WITH PILOT MOTOR CARS TRACTION CURRENT MUST REMAIN 'ON' TRAIN MUST OPERATE IN A POSSESSION OR ENGINEER'S CURRENT AREA UNDER THE CONTROL OF THE TRAIN MASTER AND THE TRAIN TEST ENGINEER ACTING AS SITE PERSON IN CHARGE CONFORMS TO THE RULE BOOK DEFINITION OF A TRAIN
SPECIAL FEATURES	GAUGE CAR IS EQUIPPED WITH LOAD GAUGE WOODEN TEMPLATES FITTED WITH METAL FINGERS. DESIGNED TO DETECT INFRINGEMENTS OF STRUCTURE GAUGE

[redacted]

GAUGING CAR



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NO.RANGE: G663	23/11/93	LULI7b

GAUGING TRAIN

TITLE		GAUGING CAR AND PILOT MOTOR CARS
FUNCTION		GAUGING THE MEASUREMENT OF RESTRICTED CLEARANCE OF TUNNEL SECTIONS TO CHECK ANY OBSTRUCTIONS THAT WOULD FOUL STRUCTURE GAUGE. THESE INCLUDE: SIGNAL EQUIPMENT TUNNEL SEGMENTS NOSING STONES CONCRETE WORK CABLE WORK NOISE REDUCTION EQUIPMENT
NUMBER RANGE		GAUGE CAR G663 PILOT CAR L 146 – L 147
DELIVERY DATE – MANUFACTURERS NAME		GAUGE CAR BIRMINGHAM RC & W LTD 1931 CONVERTED 1963 PILOT CAR METRO-CAMMELL 1938
DESIGN LIFE EXPIRES		L.146 – L.147 2000 G.663 – 1993
MODIFICATION DETAILS		NONE RECORDED
GROSS WEIGHT		PILOT CAR 28 TON GAUGE CAR 16 TON
BRAKING SYSTEM		AIR BRAKED
COUPLINGS	TYPE HEIGHT FROM RAIL	WARD COUPLERS 14"/355 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 45 MPH (72 kph) MAX
AXLE BOX TYPE		ROLLER HOFFMAN/SKF

[redacted]

GAUGING TRAIN (CONTINUED)

LIMITATIONS IN OPERATIONS	CONFORMS TO LUL TUBE VEHICLES LOAD GAUGE EXCEPT GAUGE CAR G663 RESTRICTED CENTRAL LINE – WHITE CITY (INCLUDING DEPOT) TO LIVERPOOL STREET WHEN WORKING WITH PILOT MOTOR CARS TRACTION CURRENT MUST REMAIN 'ON' TRAIN MUST OPERATE IN A POSSESSION OR ENGINEER'S CURRENT AREA UNDER THE CONTROL OF THE TRAIN MASTER AND THE TRAIN TEST ENGINEER ACTING AS SITE PERSON IN CHARGE CONFORMS TO THE RULE BOOK DEFINITION OF A TRAIN
SPECIAL FEATURES	GAUGE CAR IS EQUIPPED WITH LOAD GAUGE WOODEN TEMPLATES FITTED WITH METAL FINGERS. DESIGNED TO DETECT INFRINGEMENTS OF STRUCTURE GAUGE

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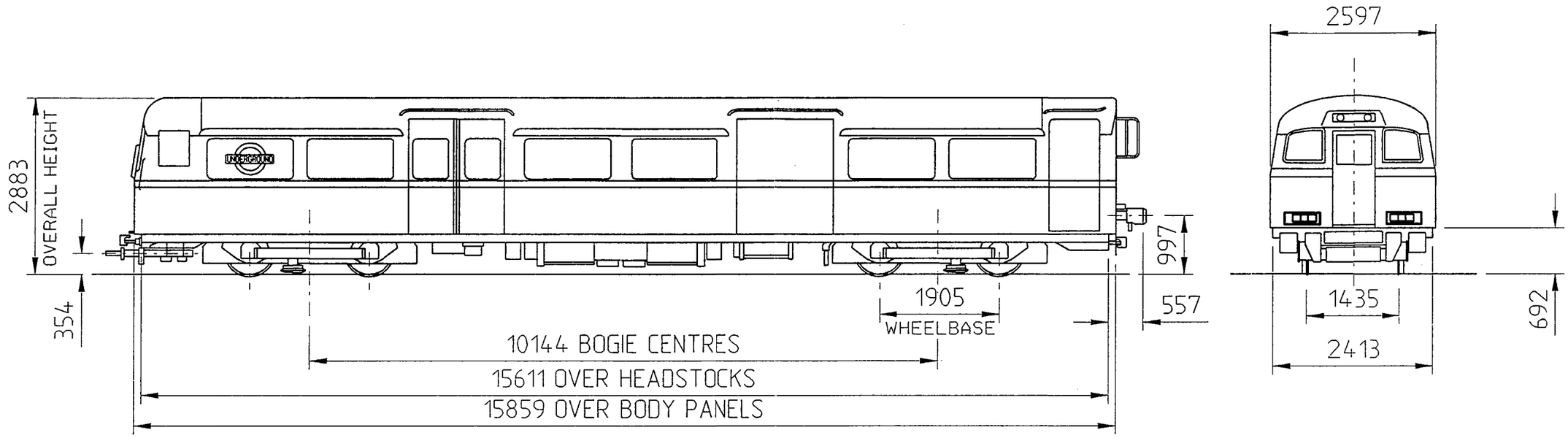
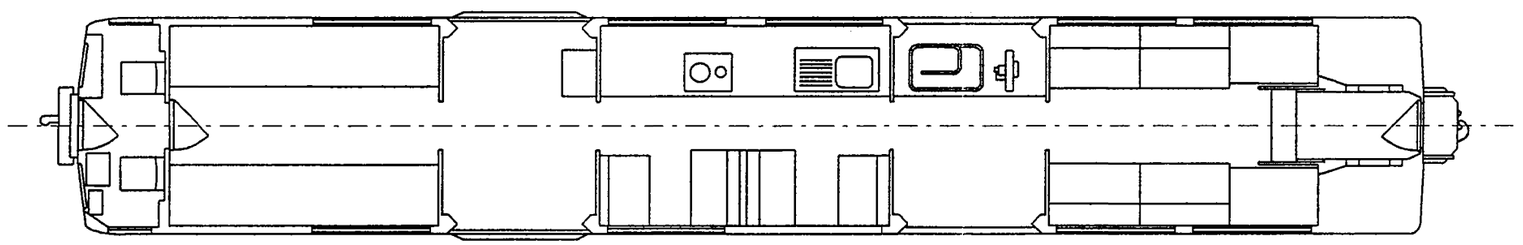
TRACK RECORDING TRAIN PILOT CAR





NO.RANGE: L132, L133	23/11/93	LUL18a

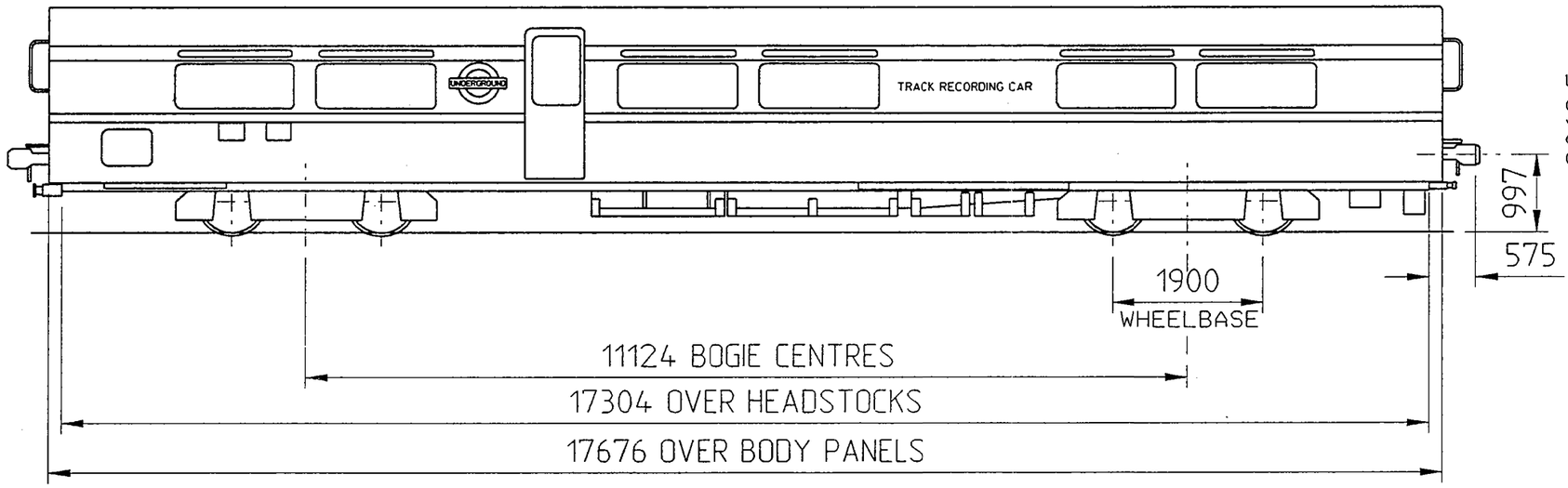
TRACK RECORDING TRAIN

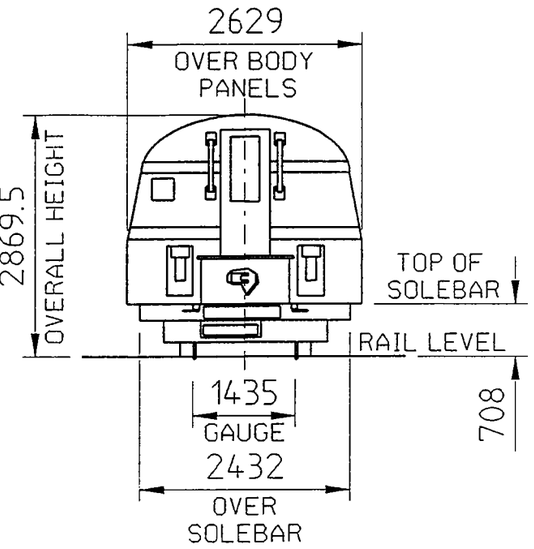
TITLE		TRACK RECORDING TRAIN
FUNCTION		TO MEASURE ELECTRONICALLY TRACK GEOMETRY. TO PRODUCE DEFECT AND STATISTICAL REPORTS FROM MEASURED DATA
NUMBER RANGE		L132, DB999666, L133 (NOTE DB999666 IS ALSO KNOWN AS TRC666 OR TRC912)
OPERATION DESCRIPTION		ON BOARD COMPUTERS AND INSTRUMENTATION PRODUCE DATA TRAVELLING AT NORMAL LINE SPEED ANALOGUE DATA IS PLOTTED ON CHART RECORDERS STATISTICAL AND DEFECT REPORTS ARE GENERATED FROM PLOTTERS, RECORDERS STORE DATA FOR OFF LINE ANALYSIS PAINT IS SPRAYED ON THE TRACK IF CERTAIN FAULTS ARE DETECTED
DELIVERY DATE – MANUFACTURERS NAME		L132/L133 EX–1960 CRAVEN STOCK 3901/3905 CONVERTED BREL DERBY 1987 DB999666 EX–1973 MET–CAM STOCK 514 CONVERTED BREL DERBY 1987
DESIGN LIFE EXPIRES		L132 – L133 – 2000 DB999666 – 2013
MODIFICATION DETAILS		SEE APPENDIX
GROSS WEIGHT		DB 999666 23.80 TONNES PILOT CAR L 132, L 133 32 TONNES
BRAKING SYSTEM		AIR BRAKED – WESTINGHOUSE SPRING PARKING BRAKE ON DB999666
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE (INNER) WEDGELOCK (OUTER) 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 70 MPH (113 kph) MAX (DB 999666) 50 MPH (80 kph) MAX (L 132 / L 133)
AXLE BOX TYPE		ROLLER HOFFMAN/SKF

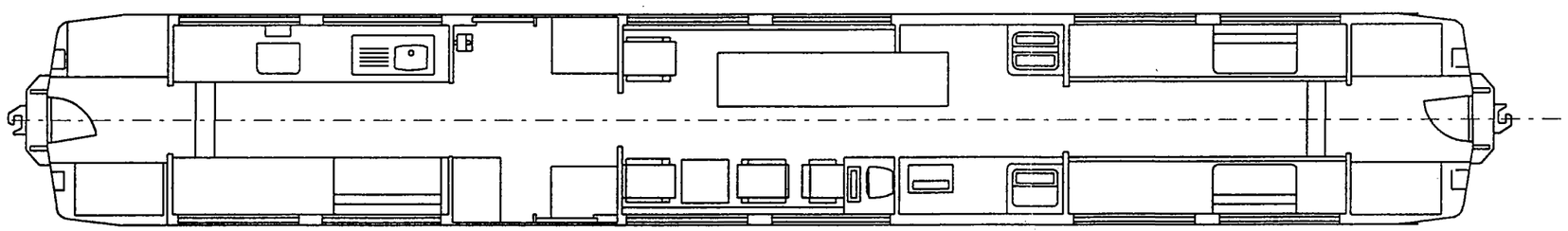
TRACK RECORDING TRAIN (CONTINUED)

LIMITATIONS IN OPERATIONS	REQUIREMENTS TO RUN THE TRV ON ROUTE REQUIRED ARE STN'S OR POSSN CONFORMS TO LUL TUBE LOAD GAUGE WITH FULL ROUTE AVAILABILITY EXCEPT – KENNINGTON LOOP, LONDON ROAD DEPOT, EALING COMMON DEPOT CURVE ON A ROAD CAN ONLY BE WORKED WHEN HAULED BY ITS PILOT CARS OR LOCO WITH ETH POWER FACILITIES THE RECORDING EQUIPMENT MAY ONLY BE USED BY AUTHORISED STAFF
SPECIAL FEATURES	ANCILLIARY EQUIPMENT THROUGH 27 WAY JUMPERS CONTROL JUMPERS (STANDARD BR) POWER SUPPLY ETH 450 – 900 VOLTS DC BR SOCKETS TO PILOT CAR LUL STANDARD TROLLEY JUMPERS

TRACK RECORDING COACH







NO.RANGE: DB999666	23/11/93	LUL18b

TRACK RECORDING TRAIN

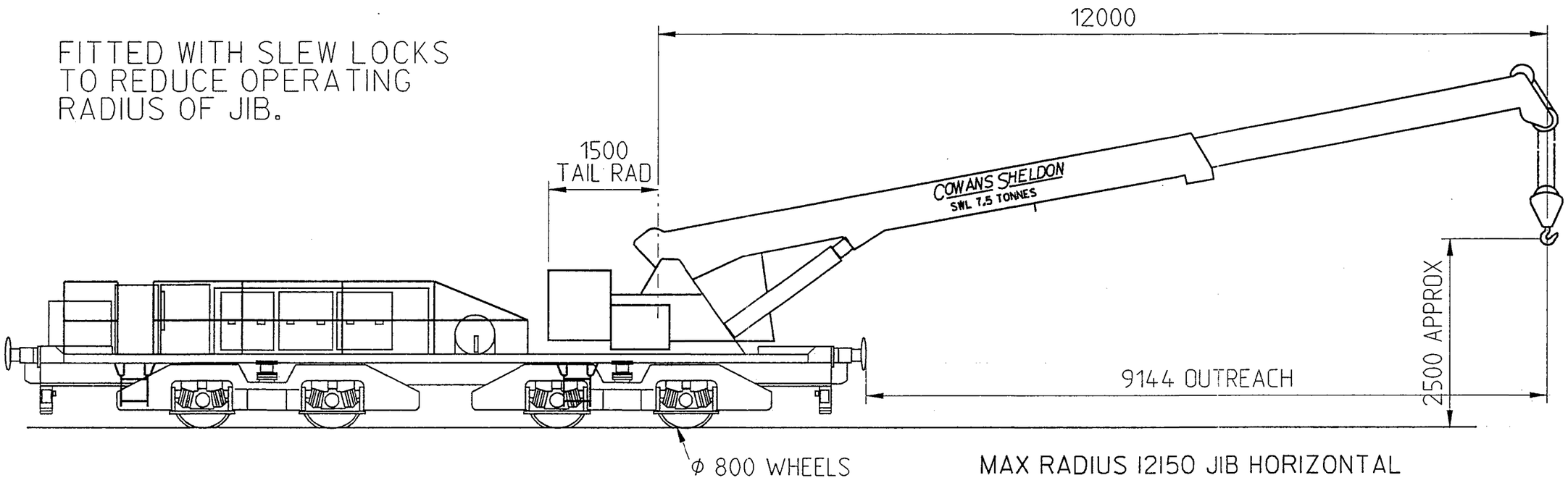
TITLE		TRACK RECORDING TRAIN
FUNCTION		TO MEASURE ELECTRONICALLY TRACK GEOMETRY. TO PRODUCE DEFECT AND STATISTICAL REPORTS FROM MEASURED DATA
NUMBER RANGE		L132, DB999666, L133 (NOTE DB999666 IS ALSO KNOWN AS TRC666 OR TRC912)
OPERATION DESCRIPTION		ON BOARD COMPUTERS AND INSTRUMENTATION PRODUCE DATA TRAVELLING AT NORMAL LINE SPEED ANALOGUE DATA IS PLOTTED ON CHART RECORDERS STATISTICAL AND DEFECT REPORTS ARE GENERATED FROM PLOTTERS, RECORDERS STORE DATA FOR OFF LINE ANALYSIS PAINT IS SPRAYED ON THE TRACK IF CERTAIN FAULTS ARE DETECTED
DELIVERY DATE – MANUFACTURERS NAME		L132/L133 EX–1960 CRAVEN STOCK 3901/3905 CONVERTED BREL DERBY 1987 DB999666 EX–1973 MET–CAM STOCK 514 CONVERTED BREL DERBY 1987
DESIGN LIFE EXPIRES		L132 – L133 – 2000 DB999666 – 2013
MODIFICATION DETAILS		SEE APPENDIX
GROSS WEIGHT		DB 999666 23.80 TONNES PILOT CAR L 132, L 133 32 TONNES
BRAKING SYSTEM		AIR BRAKED – WESTINGHOUSE SPRING PARKING BRAKE ON DB999666
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE (INNER) WEDGELOCK (OUTER) 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		30 MPH (48 kph) SERVICE 70 MPH (113 kph) MAX (DB 999666) 50 MPH (80 kph) MAX (L 132 / L 133)
AXLE BOX TYPE		ROLLER HOFFMAN/SKF

TRACK RECORDING TRAIN (CONTINUED)

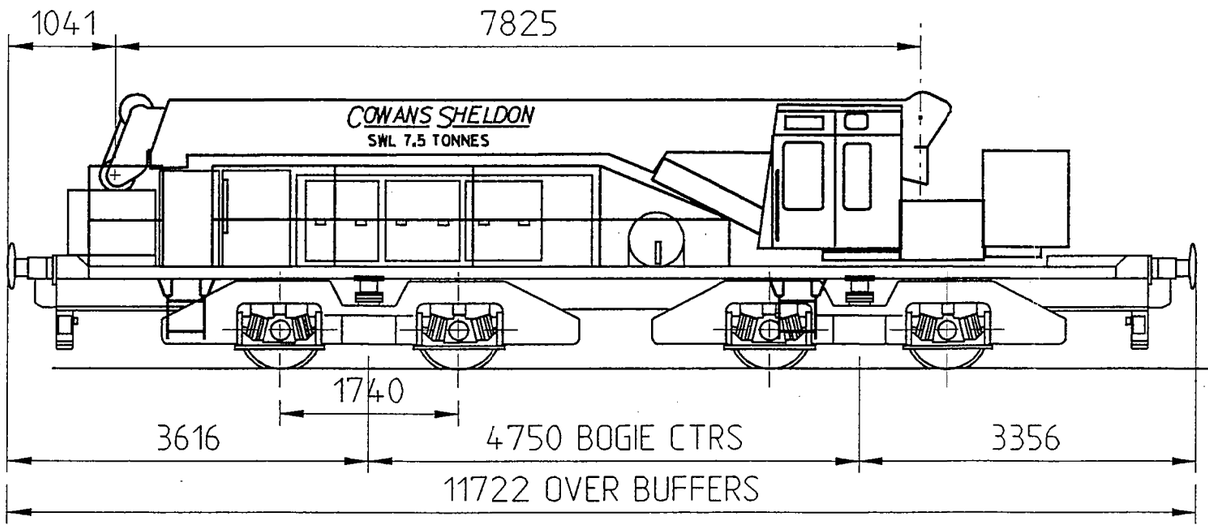
LIMITATIONS IN OPERATIONS	REQUIREMENTS TO RUN THE TRV ON ROUTE REQUIRED ARE STN'S OR POSSN CONFORMS TO LUL TUBE LOAD GAUGE WITH FULL ROUTE AVAILABILITY EXCEPT – KENNINGTON LOOP, LONDON ROAD DEPOT, EALING COMMON DEPOT CURVE ON A ROAD CAN ONLY BE WORKED WHEN HAULED BY ITS PILOT CARS OR LOCO WITH ETH POWER FACILITIES THE RECORDING EQUIPMENT MAY ONLY BE USED BY AUTHORISED STAFF
SPECIAL FEATURES	ANCILLIARY EQUIPMENT THROUGH 27 WAY JUMPERS CONTROL JUMPERS (STANDARD BR) POWER SUPPLY ETH 450 – 900 VOLTS DC BR SOCKETS TO PILOT CAR LUL STANDARD TROLLEY JUMPERS

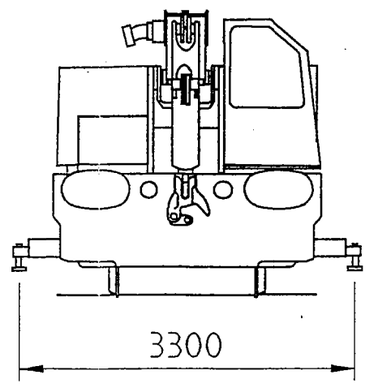
7.5 TONNE RAIL CRANE

FITTED WITH SLEW LOCKS
TO REDUCE OPERATING
RADIUS OF JIB.



MAX RADIUS 12150 JIB HORIZONTAL





NO.RANGE: C623 - C626	23/11/93	LUL19

7.5 TONNE RAIL CRANE

TITLE		7.5 TONNE DIESEL HYDRAULIC RAIL CRANE
FUNCTION		TO PROVIDE A MEANS OF HANDLING 18.3M (60FT) RUNNING (AND CONDUCTOR) RAILS TO PROVIDE A MEANS OF HANDLING ALL TYPES OF PLANT, EQUIPMENT, PALLETISED GOODS AND ALL TYPES OF MATERIALS USED IN TRACK AND INFRASTRUCTURE MAINTENANCE UP TO THE CAPACITY OF THE CRANE
NUMBER RANGE		C 623 – C 626
DELIVERY DATE – MANUFACTURERS NAME		C 623 – 1983 C 624–6 – 1985 NEI CLARKE–CHAPMAN
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2023 – 2025
MODIFICATION DETAILS		NONE CARRIED OUT ALTHOUGH PROPOSALS MADE IN RESPONSE TO A DERAILMENT MAXIMUM SPEED REDUCED AS A RESULT
GROSS WEIGHT		64 TONNES APPROXIMATELY
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		MAXIMUM TRAVEL SPEEDS: 5.75 TONNE AT 3 mph (5 kph) ON LEVEL TRACK NO LOAD AT 10 mph (16 kph) ON LEVEL TRACK IN TRAIN FORMATION AT 20 mph (32 kph) (SEE MODIFICATIONS)
AXLE BOX TYPE		ROLLER

7.5 TONNE RAIL CRANE (CONTINUED)

LIMITATIONS IN OPERATION	IN ITS FULLY AND CORRECTLY STOWED CONDITION THE CRANE CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY DOES NOT CONFORM TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' MUST ONLY WORK WHEN THE TRACTION CURRENT IS 'OFF' NORMALLY TRAVELS TO AND FROM ITS WORKSITE IN TRAIN FORMATION (AS PART OF AN ENGINEER'S TRAIN)
SPECIAL FEATURES	ABILITY TO BE SELF PROPELLED ON SITE FITTED WITH SLEW LOCKS TO LIMIT ARC OF OPERATION OF JIB

DUTY TABLE

JIB AT ANY LENGTH WITH DERRICK RAM EXTENDED TO GIVE RATED RADII FULL SLEW FREE ON RAIL

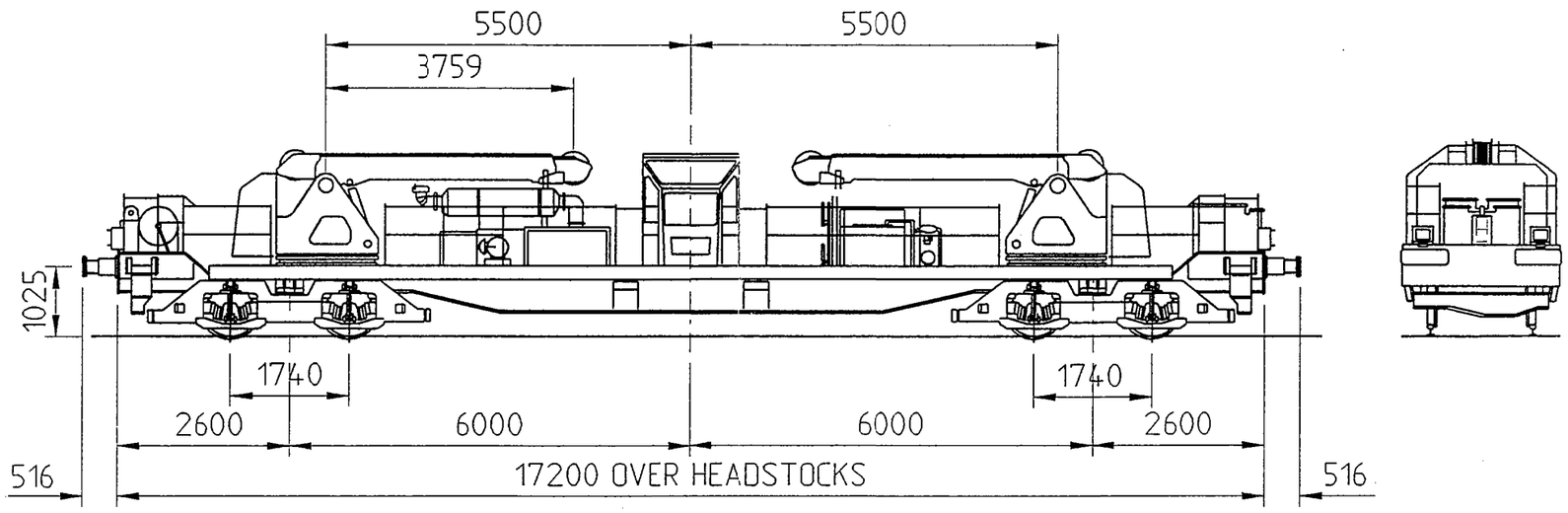
	LEVEL	50 SE	100 SE	150 SE
RADIUS (m)	LOAD (TONNES)	LOAD (TONNES)	LOAD (TONNES)	LOAD (TONNES)
4.5			6	5.75
5	6	6	5.25	5
6	5	4.75	4	3.5
7	4	3.5	3.25	3
8.5	3	2.75	2.25	2
10.5	2	1.75	1.5	1.25
12.15	1.5	1.25	1	1

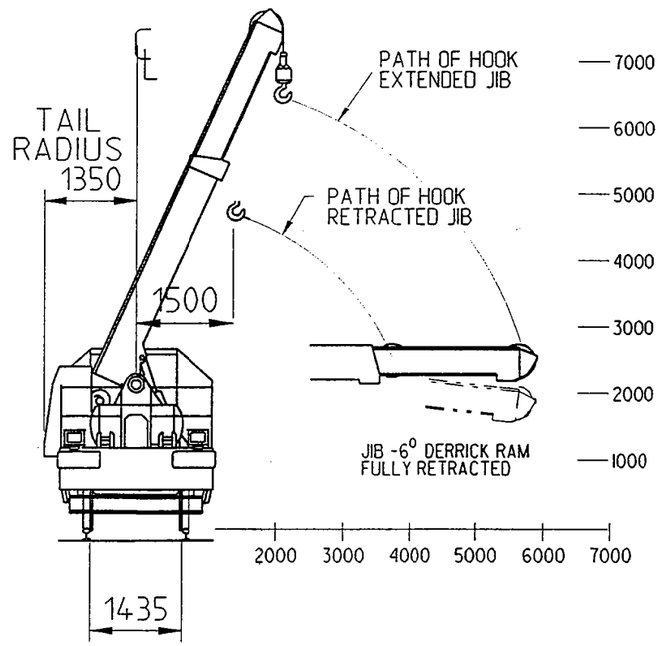
JIB FULLY RETRACTED, FULL SLEW, FREE ON RAIL, LEVEL TRACK
7.5 TONNES AT 5m RADIUS

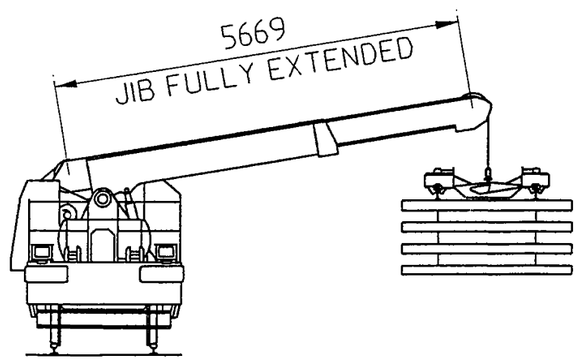
JIB FULLY EXTENDED, FREE ON RAIL, OVER END BETWEEN TRACK CENTRES
2 TONNES AT 12.15m RADIUS

GRAB, FULL SLEW, FREE ON RAIL, UP TO 100mm SE
RATED GRAB FULL UP TO 8.5m RADIUS

IOT TWIN JIB TRACKLAYER







NO.RANGE: C627	23/11/93	LUL20

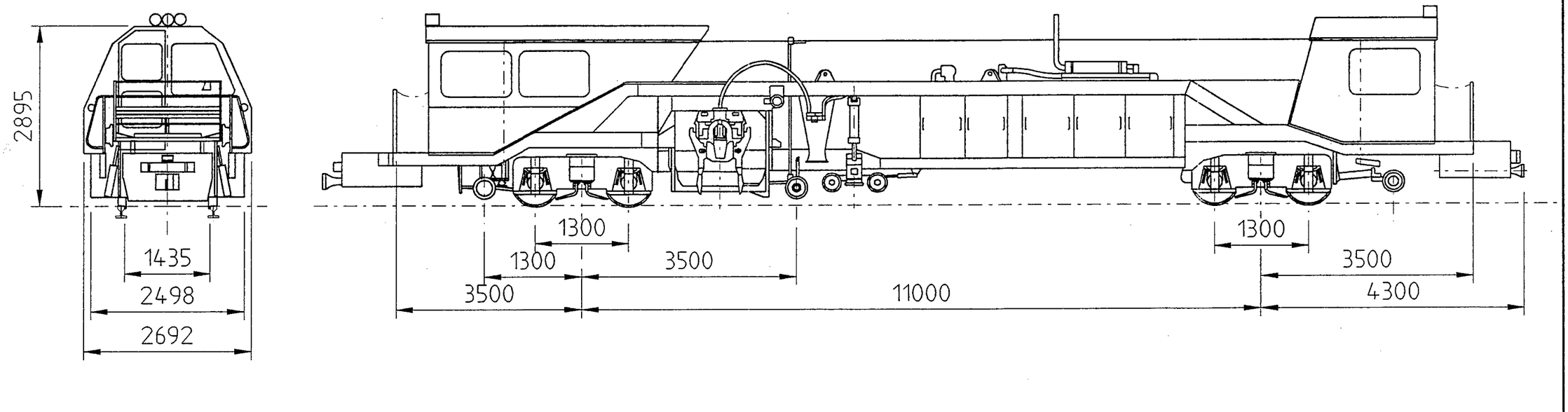
10 TONNE TWIN JIB TRACK LAYER

TITLE		10 TONNE TWIN JIB TRACK LAYING MACHINE
FUNCTION		
PRIMARY FUNCTION		
TO REMOVE AND LOAD REDUNDANT TRACK PANELS ONTO FLAT WAGONS AND OFF-LOADING NEW REPLACEMENT TRACK PANELS		
SECONDARY FUNCTION		
TO PROVIDE A MEANS OF HANDLING ALL TYPES OF PLANT, EQUIPMENT AND MATERIALS USED IN TRACK AND INFRASTRUCTURE MAINTENANCE UP TO THE CAPACITY OF THE MACHINE		
NUMBER RANGE		C 627
DELIVERY DATE – MANUFACTURERS NAME		1986 NEI CLARKE-CHAPMAN
DESIGN LIFE EXPIRES		(TAKEN AT 40 YEARS) 2026
MODIFICATION DETAILS		NONE RECORDED
GROSS WEIGHT		67 TONNES
BRAKING SYSTEM		AIR BRAKED WESTINGHOUSE TRIPLE VALVE
COUPLINGS	TYPE	BUCKEYE
	HEIGHT FROM RAIL	41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		SEE SPECIAL FEATURES
AXLE BOX TYPE		ROLLER

10 TONNE TWIN JIB TRACK LAYER (CONTINUED)

RESTRICTIONS IN USE	CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS
	FULL ROUTE AVAILABILITY
	DOES NOT CONFORM TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN'
	MUST ONLY WORK WHEN THE TRACTION CURRENT IS 'OFF'
	NORMALLY TRAVELS TO AND FROM ITS WORKSITE IN TRAIN FORMATION (AS PART OF AN ENGINEER'S TRAIN)
	THE MACHINE IS CAPABLE OF TRAVELLING WITH LOADS ON EITHER OR BOTH OF ITS JIBS
SPECIAL FEATURES	THE MACHINE HAS BEEN DESIGNED TO LIFT AND TRAVEL WITH A 10 TONNES TRACK PANEL AT A MAXIMUM RADIUS OF 4.5 METRES ON LEVEL TRACK SINGLE JIB CAPACITY = 5.8 TONNES AT 4.5 METRES RADIUS
	THE MACHINE'S DRIVE AND CONTROL CABIN IS POSITIONED IN THE MIDDLE OF THE MACHINE BETWEEN THE TWO JIBS
	MOTIVE POWER: 'DEUTZ' AIR-COOLED DIESEL ENGINE
	MAXIMUM TRAVEL SPEEDS:
	10 TONNE LOAD AT 3.7 mph (6 kph) ON LEVEL TRACK
	NO LOAD AT 10 mph (16 kph) ON LEVEL TRACK
	IN TRAIN FORMATION 50 mph (80 kph)

PLASSER TAMPING MACHINE



NO.RANGE: TMM771 - TMM773	23/11/93	LUL21

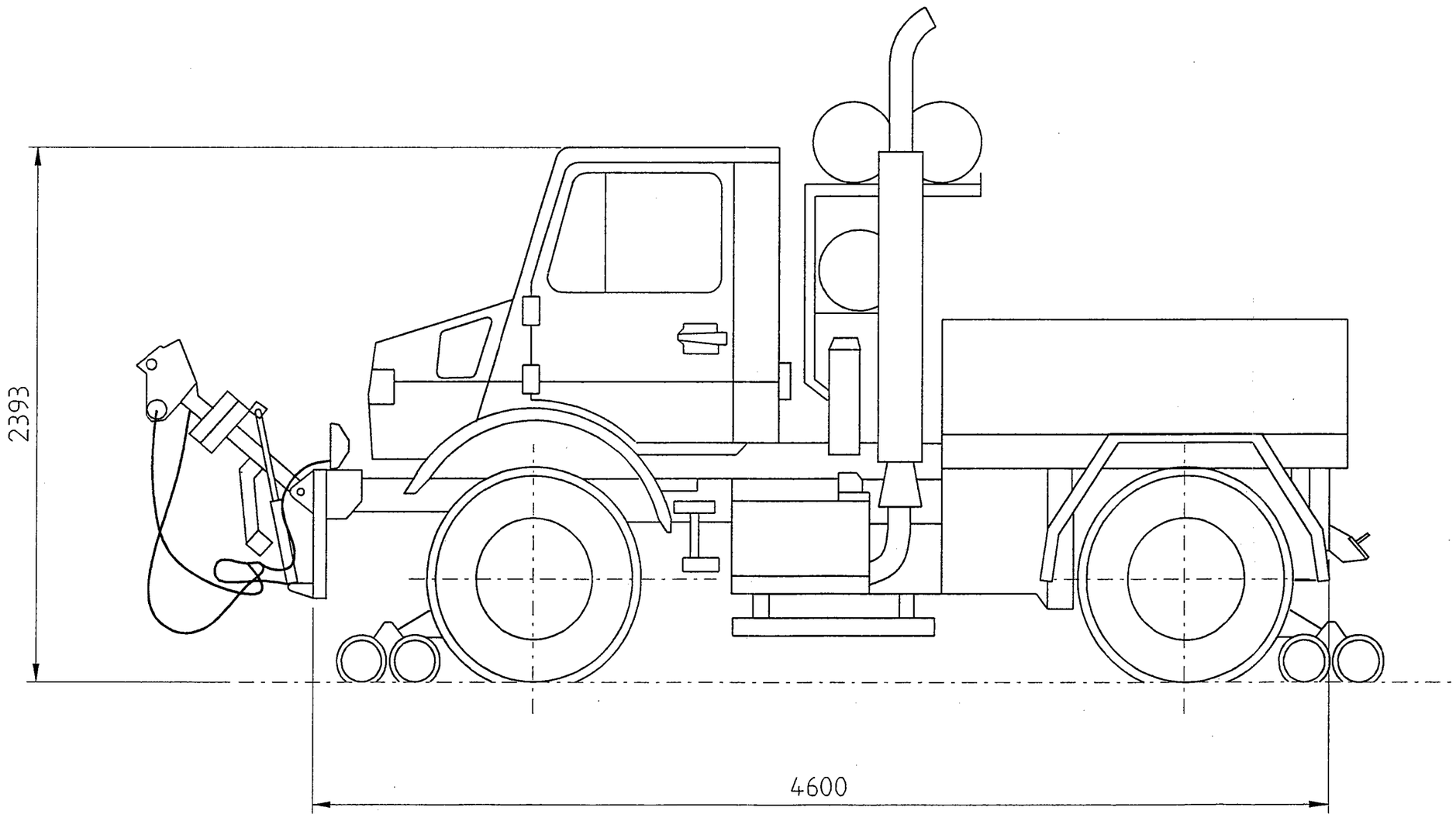
PLASSERMATIC PLAIN LINE TAMPING & LINING MACHINE

TITLE	PLASSER PU 07–16 TAMPING AND LINING MACHINE
FUNCTION	TO CORRECT LONGITUDINAL AND LATERAL GEOMETRIC TRACK ERRORS BY REPOSITIONING EACH SLEEPER PROGRESSIVELY THROUGHOUT THE LENGTH OF ITS WORKSITE AND TO MAINTAIN THE CORRECTED GEOMETRY BY SIMULTANEOUSLY COMPACTING THE TRACK BALLAST BENEATH EACH CORRECTED SLEEPER
NUMBER RANGE	TMM 771 – TMM 773
DELIVERY DATE – MANUFACTURERS NAME	1980 PLASSER AND THEURER RAILWAY MACHINERY LTD
DESIGN LIFE EXPIRES	(TAKEN AT 20 YEARS) 2000
MODIFICATION DETAILS	1. CHORD WIRE TENSIONER (TRAVELLING) 2. EMERGENCY STOWAGE SYSTEM AND PUMP 3. OIL TAIL LAMP BRACKETS 4. OIL DRUM SPANNER 5. TOOL RACK FOR P/WAY SHOVELS 6. CHORD WIRE PROTECTION BAR ON BOGIE 7. FIRE DETECTION CIRCUIT AND EXTINGUISHING SYSTEM 8. DISTRIBUTION VALVE MOUNTING BLOCK 9. HANDED PIVOT PLATES 10. SIDE COVER WARNING PLATE 11. TINE EXTRACTORS 12. SAFETY LABELS 13. SILENCER SHIELD 14. WORM AND RUNNING SHAFT 15. TRI-SOUND SIREN AND SPEECH UNIT 16. LEVELLING TROLLEY BEARING STAND PLATE 17. TINE SPADE WEAR GAUGES 18. STANDPIPE FILTER 19. ROLLER CLAMP LIFTING FRAME REINFORCEMENT 20. REPLACEMENT PULL CABLES 21. AUTOMATIC TRAIN PROTECTION 22. VISUAL DISPLAY PACKAGE (PROPOSED)
GROSS WEIGHT	40 TONNES

PLASSERMATIC PLAIN LINE TAMPING & LINING MACHINE (CONTINUED)

BRAKING SYSTEM		AIR BRAKED TWO PIPE WESTINGHOUSE TWO TRIPLE VALVES
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		MAXIMUM 25 MPH (40 kph) TUNNELLED SECTION 30 MPH (48 kph) OPEN SECTION
AXLE BOX TYPE		ROLLER
LIMITATIONS IN OPERATION		CONFORMS TO LUL 'TUBE' VEHICLE LOAD GAUGE REQUIREMENTS FULL ROUTE AVAILABILITY CONFORMS TO THE LUL RULE BOOK DEFINITION OF A 'TRAIN' <u>MUST</u> ONLY WORK WHEN TRACTION CURRENT IS 'OFF' CAN ONLY BE COUPLED TO VEHICLES FITTED WITH WEDGELOCK COUPLERS IN AN EMERGENCY
SPECIAL FEATURES		MOTIVE POWER: 'DEUTZ' AIR–COOLED DIESEL ENGINE <u>NOTE</u> <u>TAMPER 771</u> THIS MACHINE WAS INVOLVED IN A FIRE INCIDENT AND ON REPAIR WAS RE BUILT TO A DIFFERENT STANDARD. THIS MEANS THAT EQUIPMENT AND CAB ARRANGEMENTS DIFFER FROM THE OTHER TWO MACHINES, ALTHOUGH OPERATION IS THE SAME. DIFFERENCES NOT EXACTLY KNOWN, BUT ONLY INVOLVES EQUIPMENT LOCATIONS

UNIMOG MULTI-PURPOSE VEHICLE



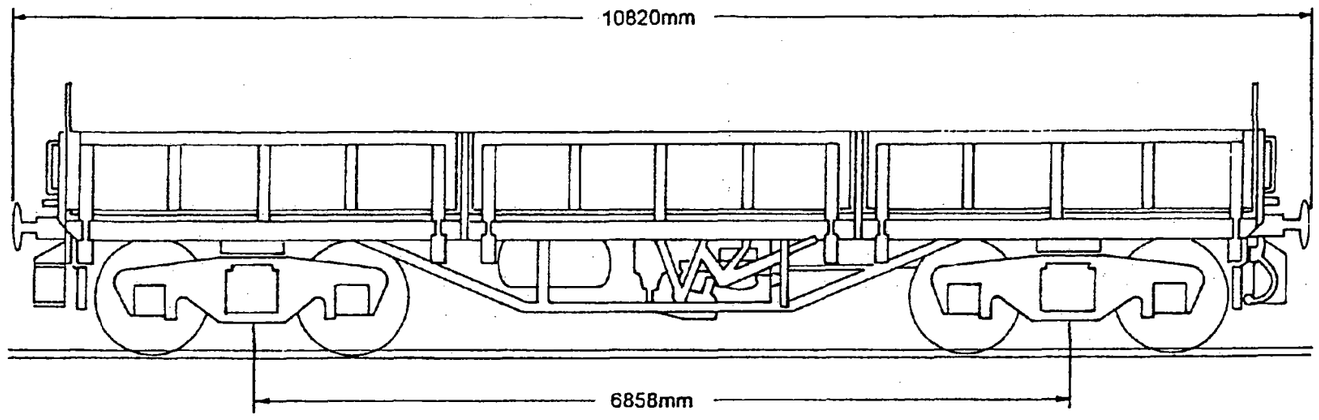
NO.RANGE: L84, L85	23/11/93	LUL22

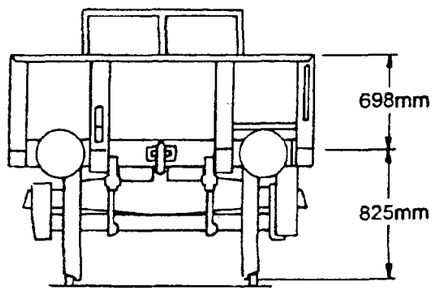
UNIMOG – MULTI PURPOSE MACHINES

TITLE		UNIMOG – MULTI PURPOSE MACHINE
FUNCTION		DEPOT SHUNTING – HAULING WAGONS
NUMBER RANGE		L 84 – L 85
DELIVERY DATE – MANUFACTURERS NAME		L 84 – 1983, L 84 – 1986 UNIMOG
DESIGN LIFE EXPIRES		(TAKEN AT 15 YEARS) L84 – 1998 L85 – 2001
MODIFICATION DETAILS		NONE RECORDED
GROSS WEIGHT		7250 KG APPROX
BRAKING SYSTEM		AIR BRAKED AUTOMOTIVE SYSTEM
COUPLINGS	TYPE HEIGHT FROM RAIL	BUCKEYE 41.5"/1055 mm
SERVICE AND MAXIMUM SPEEDS PERMITTED		RAIL 20 MPH (32 kph) FORWARD, 15 MPH (24 kph) REVERSE ROAD 50 MPH (80 kph)
AXLE BOX TYPE		ROLLER
ROUTE AVAILABILITY		ALL TUBE SECTIONS OUT OF GAUGE
SPECIAL FEATURES		ROAD/RAIL VEHICLE

SPOIL & BALLAST WAGONS (TYPE SB)

ISSUE:- **1** DATE:- **02/05/96**





General View of Wagon

SPOIL & BALLAST WAGONS (TYPE SB)

ISSUE:- **1** DATE:- **02/05/96**

3.1 GENERAL WAGON DESCRIPTION

The following information covers the modification of sixty B.R. Turbot Wagons for use by London Underground Limited, TransPlant in support of its track replacement works. The modified wagons being designated Spoil & Ballast Wagons (Type SB).

The main scope of the modifications consists of an air brake modification, fitting of control wiring, body modifications and painting. The work being carried out by ADtranz. Vehicle Repairs Division of Crewe.

Leading Particulars

Vehicle Numbers	SB 231 to SB 290
Payload Capacity:	34 tonnes
Tare Weight:	14 tonnes
Gross Weight:	48 tonnes

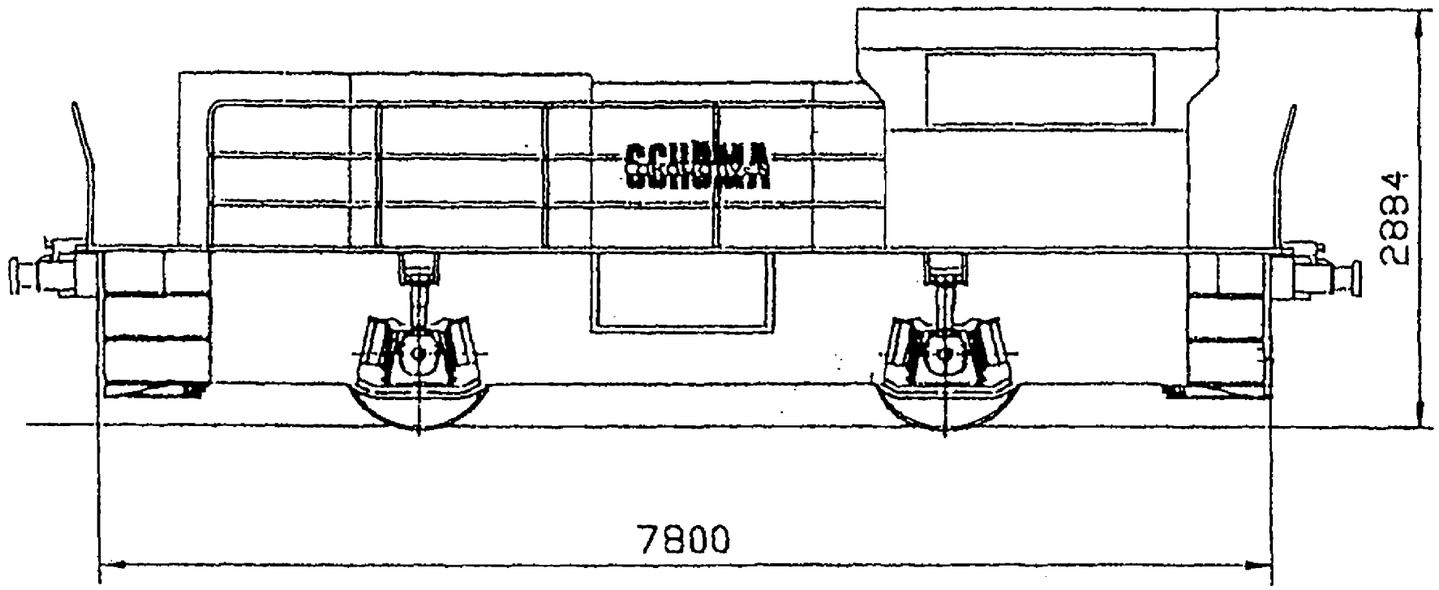
Design Criteria

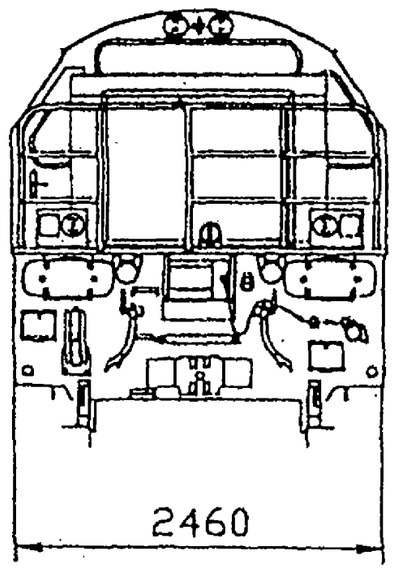
Loading gauge	LTE 49754
Operational Speed:	48 kph (30 mph)
Maximum speed	72 kph (45 mph)
Min horizontal curve	46m rad
Min vertical curve	200m rad
Max super elevation	150mm
Max cant gradient	1 in 150
Max incline gradient	1 in 29

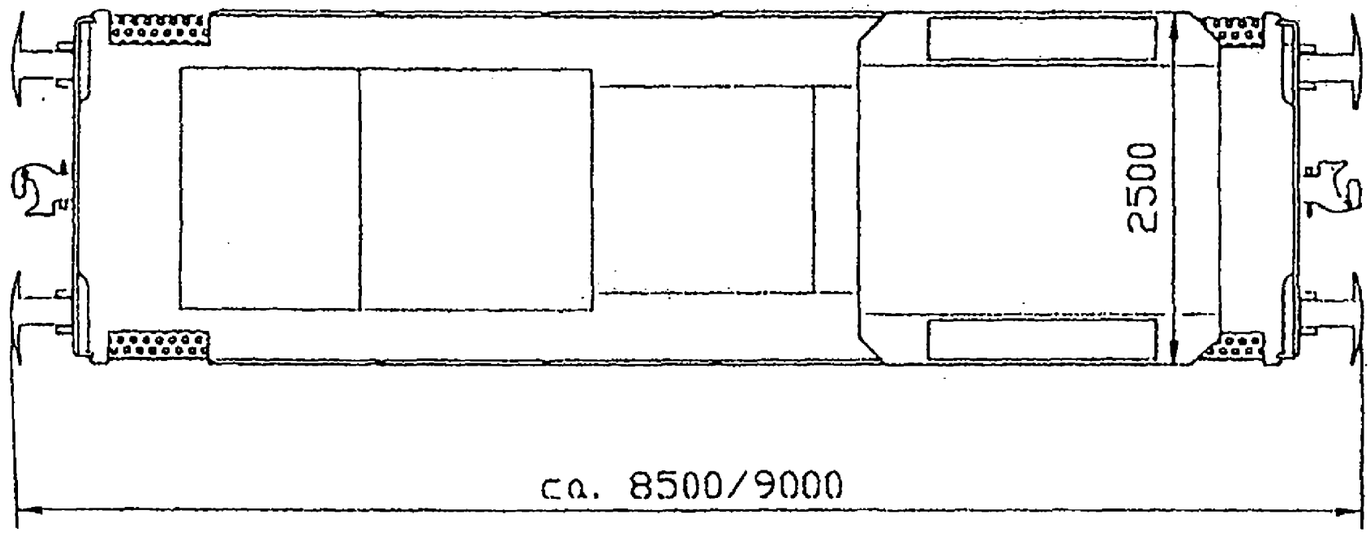
Principal Dimensions

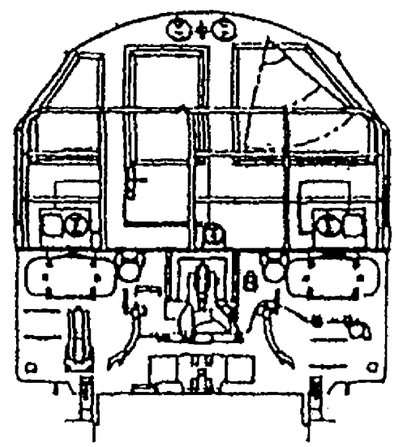
Length over extended buffers	10820mm
Length over headstock	9754mm
Length over deck between headstocks	9726mm
Width over deck:-	
Over floor plates	2427mm
Inside door plates	2435mm
Bulk head height from deck	698mm
Bogie centres	6858mm
Deck height tare	825mm
Height to CL buffing & drawgear tare	1035 $\pm$ 32mm

CFL 500-V-R









4.2. LOCOMOTIVE INTRODUCTION

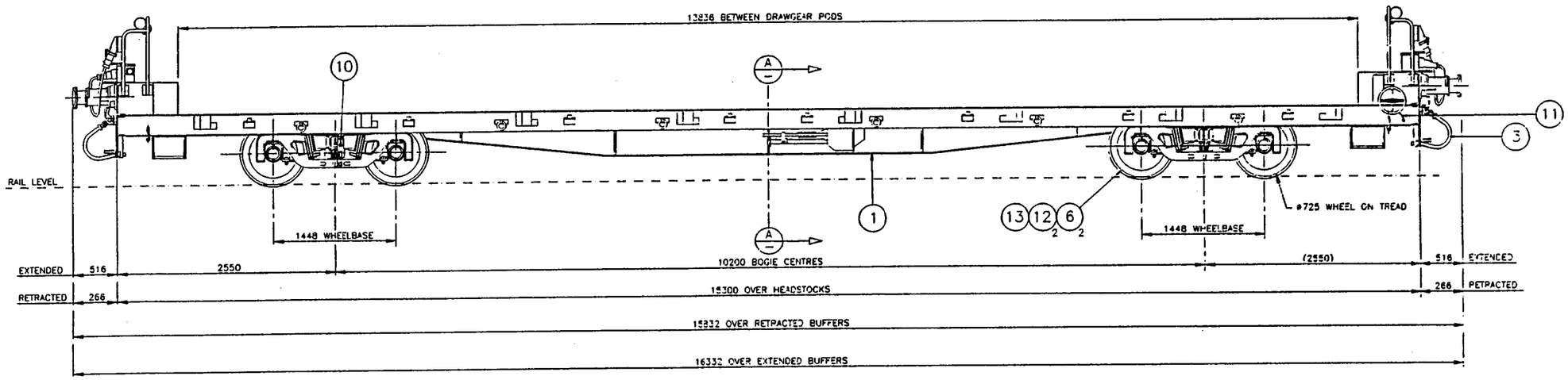
General Specification

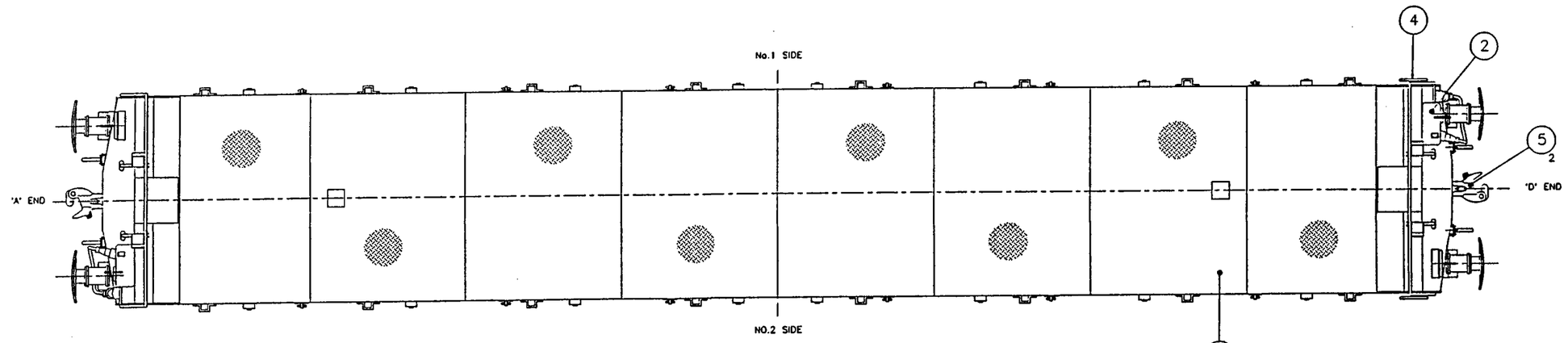
MANUFACTURED BY	SCHOMA LOKOMOTIVEN. DIEPHOLZ, GERMANY.
DELIVERED TO LUL	FEBRUARY, 1996. (LOCO 1) (Fleet of 14)
LOCO TYPE	CFL 500VR CFL Cardan Fluid Locomotive 500 Horse Power (380 Kw) V Voith Transmission R Shunting Locomotive (Rangierlok)
WEIGHT	33.88 tonnes
LENGTH	8500 mm over buffers
BETWEEN AXLES	3500 mm
GAUGE	LUL tube profile
MAX SPEED	50 km/h
SLOW SPEED	1 to 4 km/h (adjustable 0.1 km/h increments)
PRIMARY POWER	6 cylinder, inline diesel engine. Detroit Diesel series 60
TRANSMISSION	Hydro-dynamic Gearbox Voith L3r4 U2
WHEEL SLIDE	Controlled via Krauss Maffei Control Computer
WHEEL SLIP	Controlled via Krauss Maffei Control Computer
BRAKING	2 system, Direct & Automatic (Davis Metcalfe) Deadman operation (vigilance delayed) 7 seconds to alarm, 5 seconds to brake (12 total) All Loco's now fitted with a Tripcock

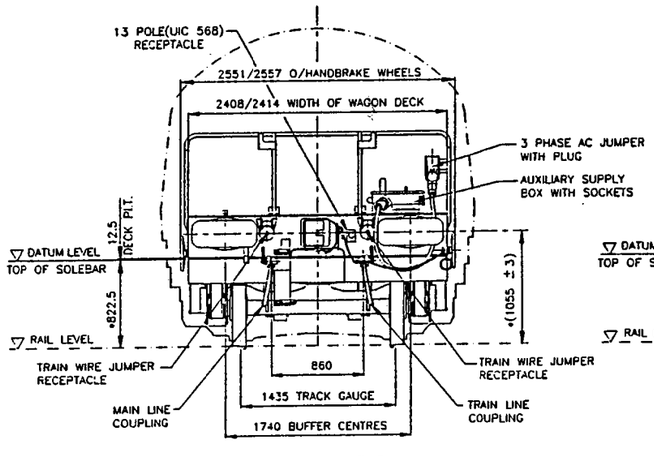
Fluids

ENGINE	40.5 Lts Engine Oil	Rimula X15/40
VOITH TRANSMISSION	120 Lts Hydraulic Oil	Tegula 32
AXLE GEARBOXES (diffs)	12 Lts Oil (per axle)	Spirax 80W/90
COMPRESSOR	4 Lts Oil	Corena P100
FUEL	600 Lts Greenergy City Diesel (Low Sulphur)	
RADIATOR	85 Lts Water/Glycol (50/50)	
WINDSCREEN WASHER	2 Lts Wash Solution	
AIR CONDITIONING	2 Lts Water/Glycol (75/25)	
AIR CONDITIONING	2.5 Kg HFC R407c	

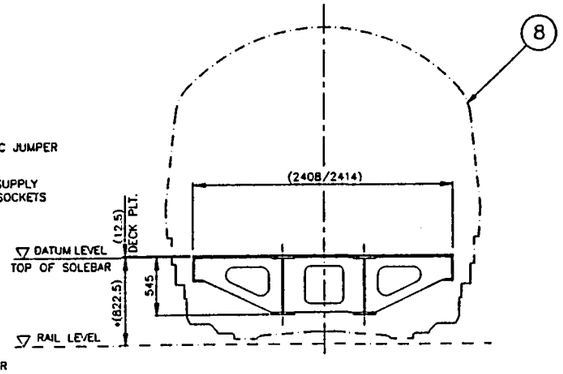
DRAWING No:	REV:							
214/A/01/00/200		FIRST ANGLE PROJECTION	DO NOT SCALE – IF IN DOUBT ASK !	DIMENSIONS Over, to or between surfaces for which limits are not shown to be within the following tolerances. MACHINED ± 0.25 mm GENERAL FABRICATION up to 300 mm ± 1.0 mm; 301 to 1000 mm ± 1.5mm; 1001 to 3000 mm ± 2.0mm; above 3000 mm ± 3.0 mm	WELDING: Unless otherwise stated 1. All Welding to be in accordance with BS 5135 2. All Welds to be continuous 3. Fillet Welds to have leg length equal to smallest plate thickness	REMOVE ALL SHARP EDGES AND CORNERS	BEND RADII TO BE A MINIMUM OF TWICE MATERIAL THICKNESS UNLESS STATED OTHERWISE.







VIEW ON 'D' END.



SECTION A–A.

* THESE HEIGHTS ARE MEASURED FROM TOP OF RUNNING RAIL WITH WAGON AT TARE CONDITION AND WITH NEW WHEELS.

0 1000 2000 3000

PRINCIPAL PARTICULARS	
TARE WEIGHT	20 TONNES MAXIMUM
LOADING CAPACITY	30 TONNES EVENLY DISTRIBUTED
	10 TONNES CONCENTRATED ON CENTRE 2.0m

ITEM	DESCRIPTION	MAT'L	SPEC'N	REMARKS	WELL QTY. PER WAGON	FLAT QTY. PER WAGON	DRUM QTY. PER WAGON	WT. KG.
13	EARTH BONDING			214/A/11/00/208		1		
12	BOGIE/UNDERFRAME SHIMMING			214/A/02/00/244		2		
11	SCREWBRAKE INDICATOR ARRGT.–FLAT			214/A/03/00/242		1		
10	"VTA" CHANGE OVER VALVE			214/A/03/00/240		1		
9	FLOOR PLATE ASS'Y & DETAIL.			214/A/02/00/215		1		
8	GAUGE & KINEMATIC PROFILE.			214/A/05/00/200		1		
7	POWER BRAKE ARRANGEMENT.			214/A/03/00/200		1		
6	BOGIE (FOWELL DUFFRYN)			SBA 40660		2		
5	HEADSTOCK ARRANGEMENT.			214/A/01/00/203.		2		
4	SCREWBRAKE ARRANGEMENT.			214/A/03/00/203.		1		
3	BRAKE PIPING ARRANGEMENT.			214/A/03/00/233. 214/A/03/C0/234. 214/A/03/00/235. 214/A/03/00/236.		1		
2	CONDUIT ARRANGEMENT.			214/A/11/00/206		1		
1	UNDERFRAME ARRANGEMENT.			214/A/02/00/200. 214/A/02/00/201.		1		

Rev	Date	Description	By	Chkd.	App.	App.

Jubilee Line Extension

London Underground Limited, Jubilee Line Extension Project Team, 17 Deore Street - St. James's Park, London SW1H 0DT, Telephone (071) 222 5363 @ 1991

Bombardier Prorail Limited, Norbury, Wakefield, West Yorkshire, WF4 5QH.

Title: GENERAL ARRANGEMENT FLAT WAGON

Ref: B.P.L. Drg. No. 93063/01 — Approved: LJ Lovell

Checked: JM 20/7/94 — Approved: JMB 20/7/94

Scale: 1:20 — Date: 7.1.94 — Drawn: DLM — CAD File Name:

DRAWING No: 214/A/01/00/200 — REV:

GENERAL DESCRIPTION

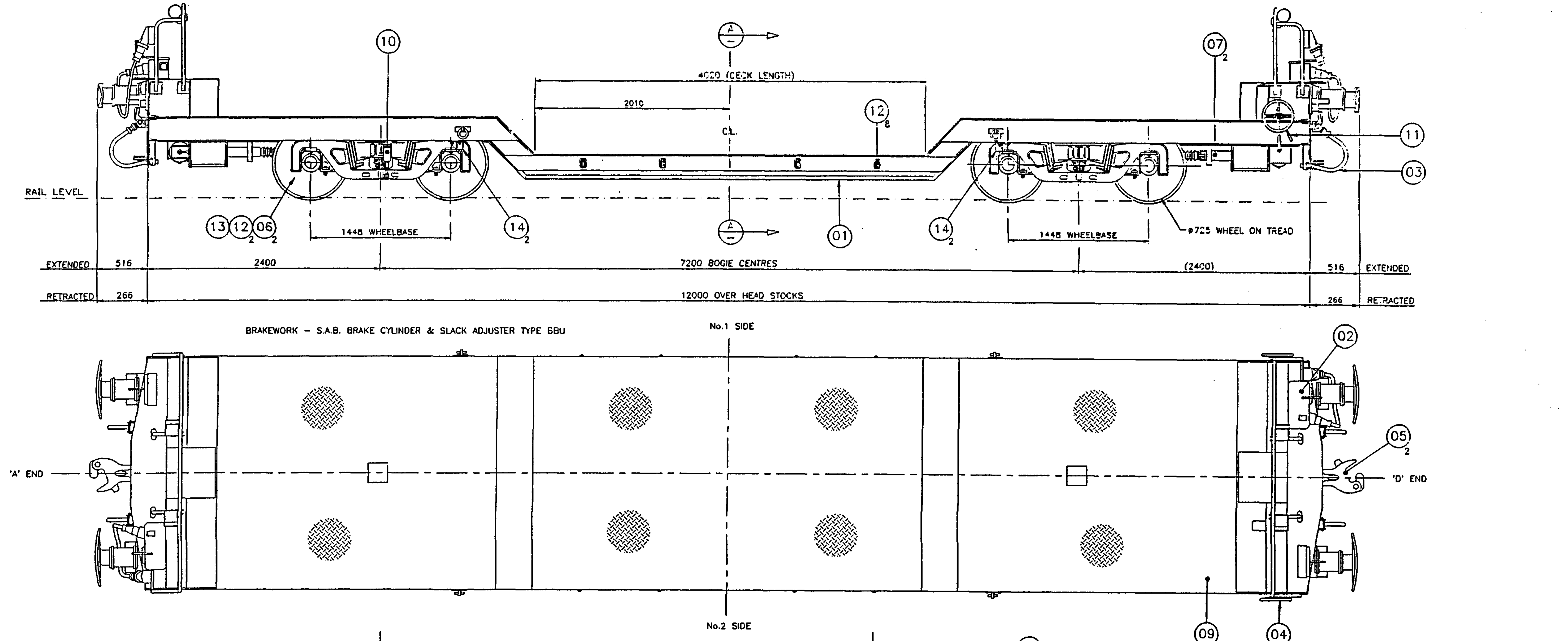
The wagon is a general purpose flat deck wagon supported by two twin axle bogies. The vehicle has a 30 tonne distributed load capacity and 18.7 tonne tare weight.

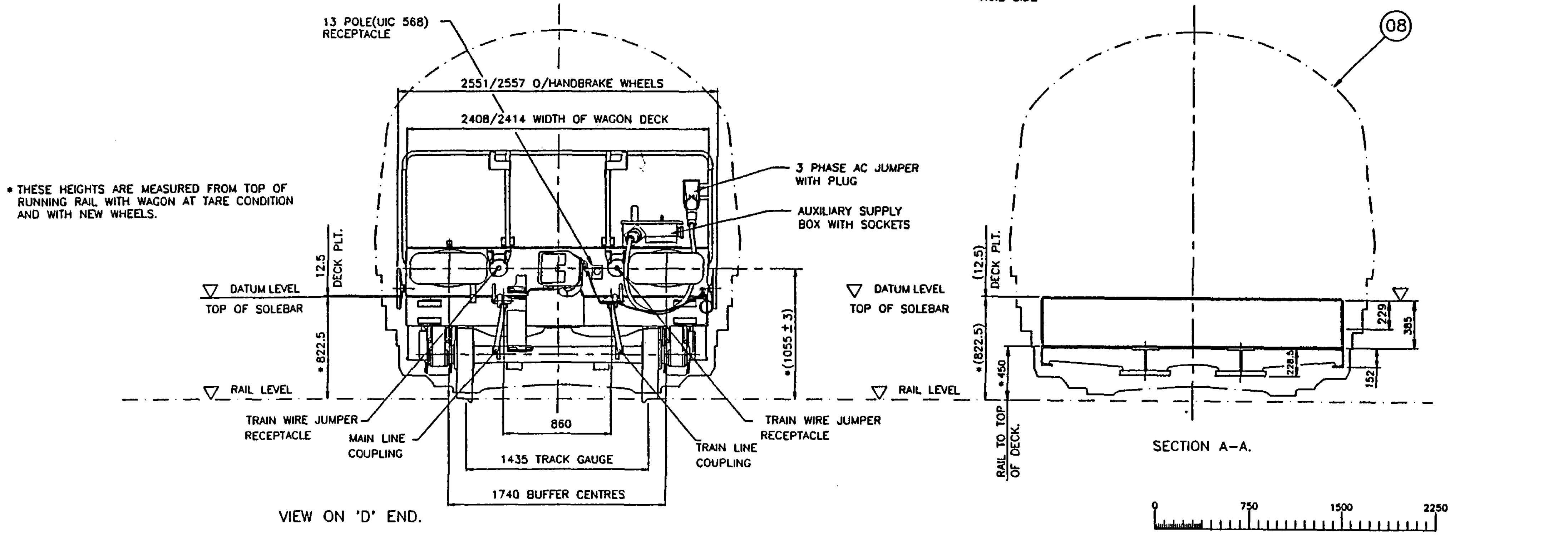
PRINCIPAL DIMENSIONS AND SETTINGS

Length over headstocks	15300 mm
Length over deck between headstocks	13836 mm
Length over extended buffers	16332 mm
Bogie Centres	10200 mm
Deck height (tare condition and new wheels)	835 mm
Height to C.L. buffing and drawgear tare	1055± 3 mm
Loading gauge	LUL drg SK 12212
Min horizontal curve	See section 5, page 14
Min vertical curve	400m rad
Max super elevation	150 mm
Max cant gradient	1 in 29
Service speed	30 mph
Maximum speed	45 mph
Regulator 'A' dimension	48 +0 - 4mm
VTA Changeover setting	8 ±1mm
Brake Block Clearance	6 +0 -1mm
Brake Cylinder Pressure - Tare	2.55 bar
Brake Cylinder Pressure - Laden	3.75 bar
Wheel Profile	LUL Drg. 57933

[redacted]

DRAWING No: 214/A/01/00/201	REV:	FIRST ANGLE PROJECTION	DO NOT SCALE – IF IN DOUBT ASK !	DIMENSIONS Over, to or between surfaces for which limits are not shown to be within the following tolerances. MACHINED ± 0.25 mm GENERAL FABRICATION	WELDING: Unless otherwise stated 1. All Welding to be in accordance with BS 5135 2. All Welds to be continuous 3. Fillet Welds to have leg length equal to smallest plate thickness	REMOVE ALL SHARP EDGES AND CORNERS	BEND RADII TO BE A MINIMUM OF TWICE MATERIAL THICKNESS UNLESS STATED OTHERWISE.





PRINCIPAL PARTICULARS	
TARE WEIGHT	18 TONNES MAXIMUM
LOADING CAPACITY	14 TONNES EVENLY DISTRIBUTED WITHIN WELL
	10 TONNES CONCENTRATED ON CENTRE 2.0m

ITEM	DESCRIPTION	MAT'L	SPEC'N	REMARKS	WELL	FLAT	DRUM	WT. KG.
14	BOGIE ROTATIONAL STOP			214/A/02/00/248	4			
13	EARTH BONDING			214/A/11/00/208	1			
12	BOGIE/UNDERFRAME SHIMMING			214/A/02/00/243	2			
12	WELL LASHING RING ASSY.			214/A/03/00/230 ITEM 25	8			
11	SCREWBRAKE INDICATOR ARRGT.-WELL			214/A/03/00/241	1			
10	"VTA" CHANGE OVER VALVE			214/A/03/00/223	1			
09	FLOOR PLATE ASS'Y & DETAIL.			214/A/02/00/226	1			
08	GAUGE & KINEMATIC PROFILE.			214/A/05/00/201	1			
07	POWER BRAKE ARRANGEMENT.			214/A/03/00/207	2			
06	BOGIE (POWELL DUFFRYN)			SBA 40660	2			
05	HEADSTOCK ARRANGEMENT.			214/A/01/00/206	2			
04	SCREWBRAKE ARRANGEMENT.			214/A/03/00/227	1			
03	BRAKE PIPING ARRANGEMENT.			214/A/03/00/221. 214/A/03/00/215. 214/A/03/00/214. 214/A/03/00/213.	1			
02	CONDUIT ARRANGEMENT.			214/A/11/00/201. 214/A/11/00/200.	1			
01	UNDERFRAME ARRANGEMENT.			214/A/02/00/217. 214/A/02/00/216.	1			

QTY. PER WAGON

Rev.	Date	Description	By	Chkd.	App.	App.

Jubilee Line Extension

Bombardier Prorail Limited, Horbury, Wakefield, West Yorkshire, WF4 5QH.

London Underground Limited
Jubilee Line Extension Project Team
17 Dacre Street – St. James's Park
London SW1H 0DT
Telephone (071) 222 5363
© 1991

Title: GENERAL ARRANGEMENT ~ WELL

Ref: B.P.L. Drg. No. 93064/01	Approved: T.P.
Checked: 30/11/94	Approved: 30/11/94
Scale: 1:15	Date: 6.1.94
Drawn:	CAD File Name:
DRAWING No: 214/A/01/00/201	REV:

GENERAL DESCRIPTION

The wagon is a general purpose well wagon supported by two twin axle bogies. The vehicle has a 14 tonne distributed load capacity and 18.0 tonne tare weight.

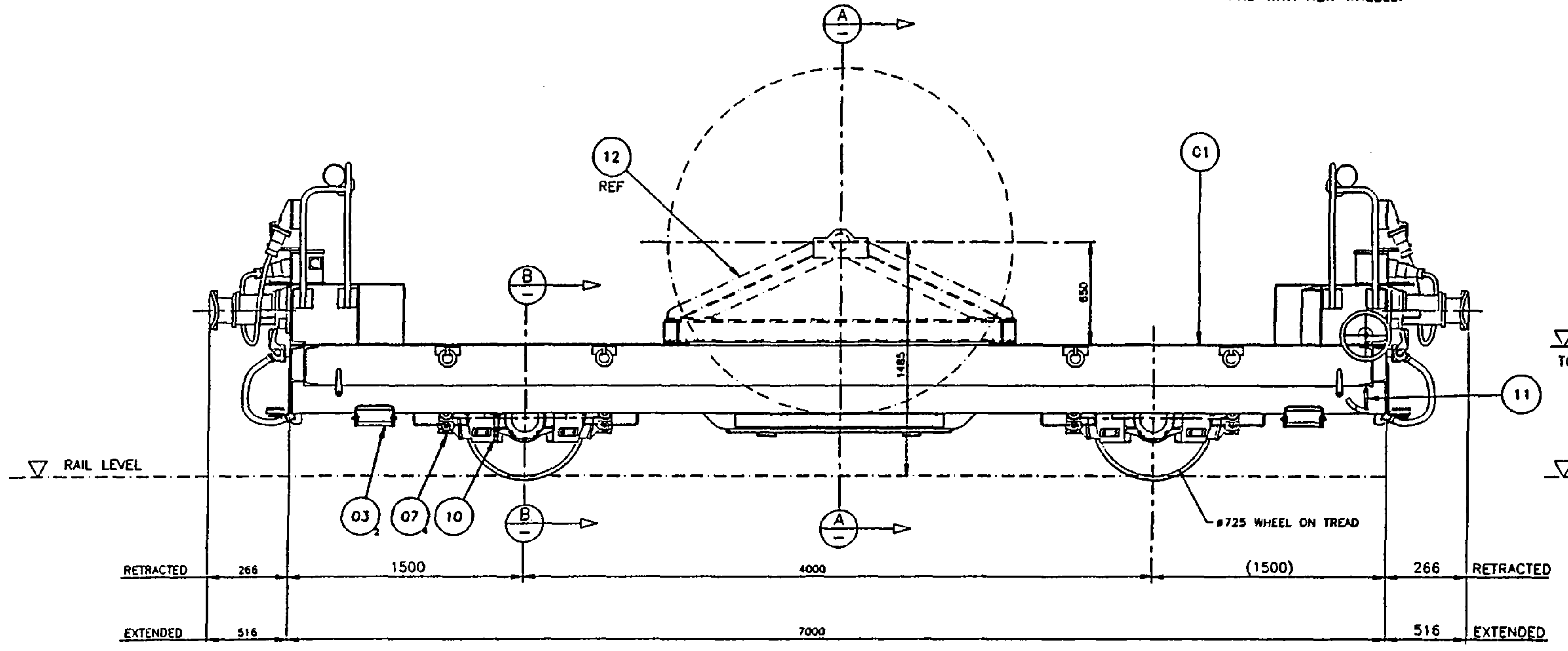
PRINCIPAL DIMENSIONS AND SETTINGS

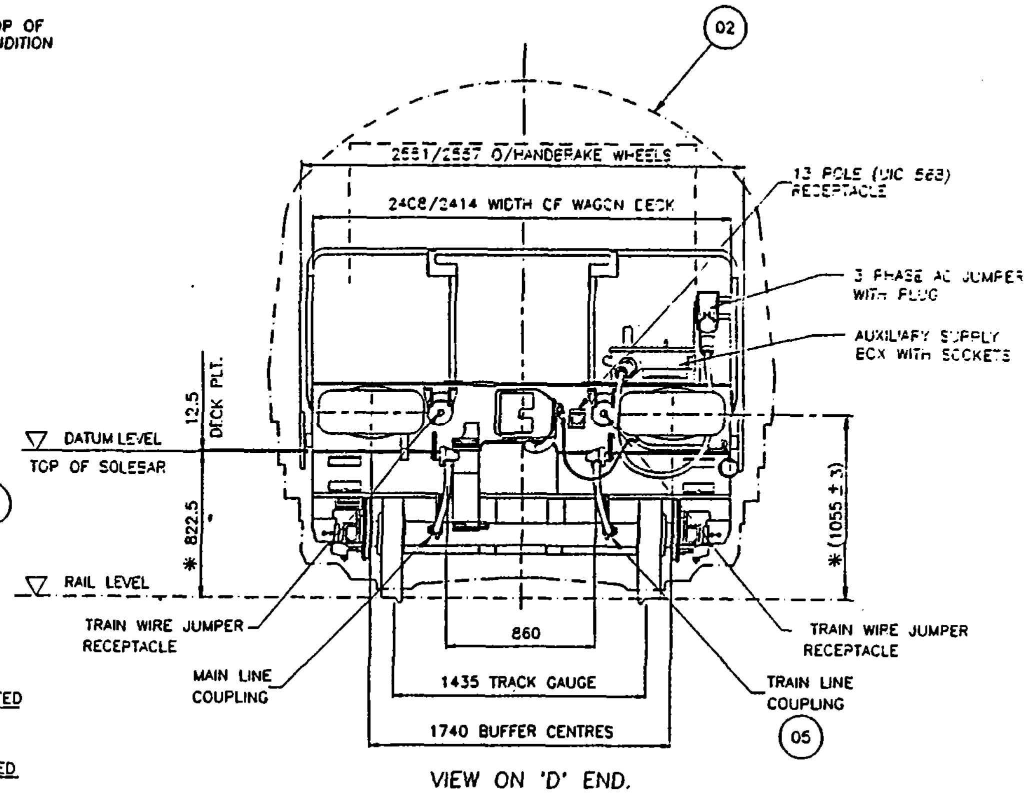
Length over headstocks	12000 mm
Length over deck between headstocks	10536 mm
Length over extended buffers	13032 mm
Bogie Centres	7200 mm
Deck height (tare condition and new wheels)	835 mm
Well height (tare condition and new wheels)	450mm
Height to C.L. buffing and drawgear tare	1055± 3 mm
Loading gauge	LUL drg SK 12212
Min horizontal curve	See section 5, page 14
Min vertical curve	400m rad
Max super elevation	150 mm
Max cant gradient	1 in 29
Service speed	30 mph
Maximum speed	45 mph
Regulator 'A' dimension	14 +0 - 4mm
VTA Changeover setting	4 ±1mm
Brake Block Clearance	6 +0 -1mm
Brake Cylinder Pressure - Tare	2.89 bar
Brake Cylinder Pressure - Laden	3.75 bar
Wheel Profile	LUL Drg. 57933

[redacted]

DRAWING No: 214/A/01/00/202	REV:	FIRST ANGLE PROJECTION	DO NOT SCALE – IF IN DOUBT ASK !	DIMENSIONS Over, to or between surfaces for which limits are not shown to be within the following tolerances. MACHINED ± 0.25 mm GENERAL FABRICATION	WELDING: Unless otherwise stated 1. All Welding to be in accordance with BS 5135 2. All Welds to be continuous 3. Fillet Welds to have leg length equal to smallest plate thickness	REMOVE ALL SHARP EDGES AND CORNERS	BEND RADII TO BE A MINIMUM OF TWICE MATERIAL THICKNESS UNLESS STATED OTHERWISE.

* THESE HEIGHTS ARE MEASURED FROM TOP OF RUNNING RAIL WITH WAGON AT TARE CONDITION AND WITH NEW WHEELS.

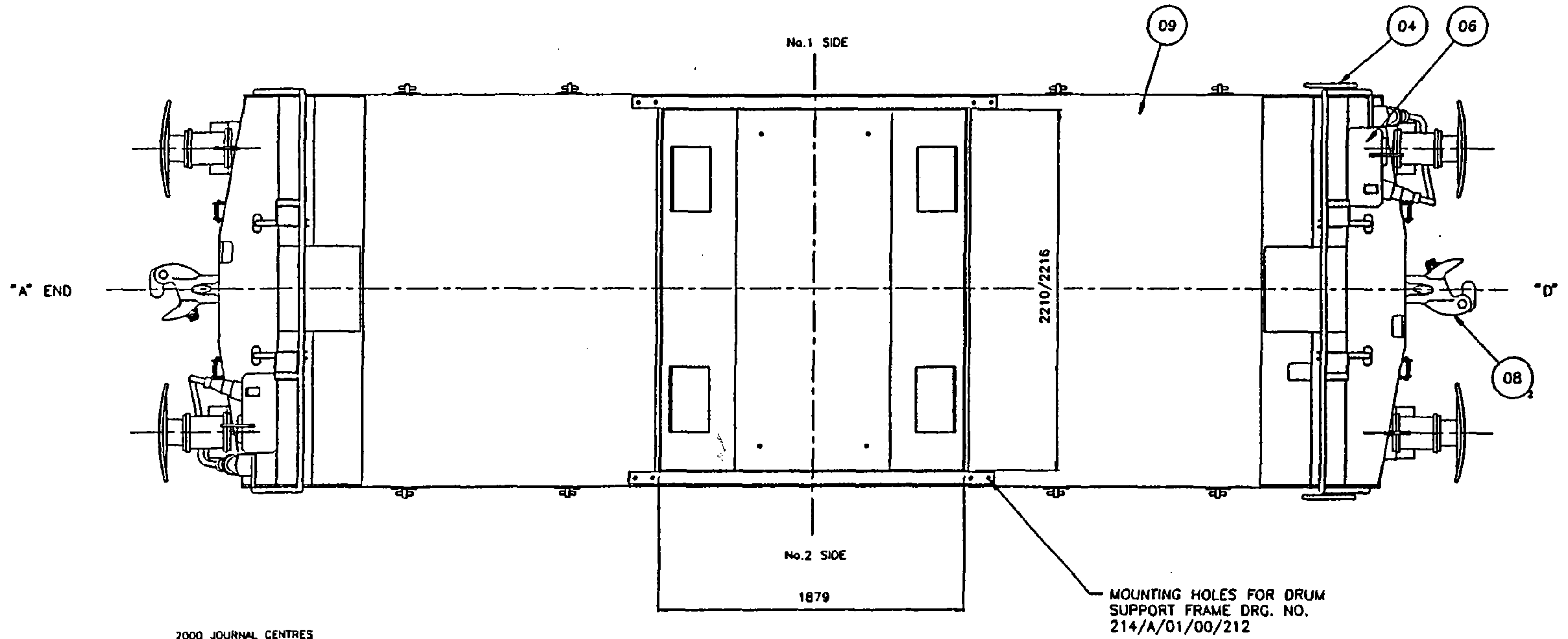


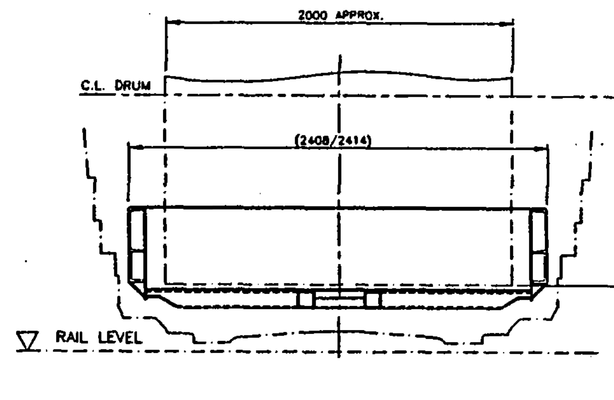


VIEW ON 'D' END.

BRAKEWORK – SAB BRAKE CYLINDER & SLACK ADJUSTER TYPE BBU

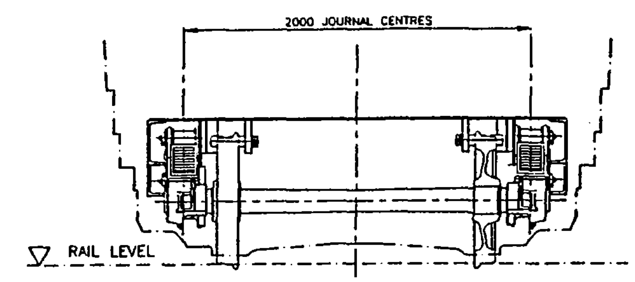
SUSPENSION – LEAF SPRING TO SUIT TARE WEIGHT OF 12.3 TONNES





SECTION A–A.

PRINCIPAL PARTICULARS	
TARE WEIGHT	12.3 TONNES MAXIMUM
CABLE DRUM WEIGHT	8 TONNES



SECTION B–B.

0 750 1500 2250

ITEM	DESCRIPTION	MAT'L	SPEC'N	REMARKS	WELL	FLAT	DRUM	WT. KG.
12	DRUM SUPPORT FRAME			214/A/01/00/211			1	
11	SCEWBRAKE INDICATOR ARRGT.			214/A/03/00/244			1	
10	"VTA" CHANGE OVER VALVE			214/A/03/00/243			1	
9	FLOORPLATE ASSEMBLY & DETAIL			214/A/02/00/233			1	
8	HEADSTOCK ARRANGEMENT			214/A/01/00/207			2	
7	SUSPENSION ARRANGEMENT			214/A/02/00/237			4	
6	CONDUIT ARRANGEMENT			214/A/11/00/205 214/A/11/00/204			1	
5	BRAKE PIPEWORK ARRANGEMENT			214/A/03/00/231 214/A/03/00/230 214/A/03/00/229			1	
4	SCREWBRAKE ARRANGEMENT			214/A/03/00/210			1	
3	POWER BRAKE ARRANGEMENT			214/A/03/00/208			2	
2	GAUGE & KINEMATIC PROFILE			214/A/05/00/202			1	
1	UNDERFRAME ARRANGEMENT			214/A/02/00/220			1	
					QTY. PER WAGON			

Rev.	Date	Description	By	Chkd.	App.	App.

Jubilee Line Extension

Bombardier Prorail Limited, Horbury, Wakefield, West Yorkshire, WF4 5QH.

London Underground Limited, Jubilee Line Extension Project Team, 17 Ossory Street – St. James's Park, London SW1H 0DT, Telephone (071) 222 5363 © 1991

Title: GENERAL ARRANGEMENT ~ DRUM

Scale: 1:15	Date: 7.1.94	Drawn: DLM	CAD File Name:	Ref: B.P.L. Drg. no. 93065/01	Checked: 7-3-94	Approved:	Approved: 7/3/94

DRAWING No: 214/A/01/00/202 REV:

GENERAL DESCRIPTION

The wagon is a cable drum wagon supported by two axles. The vehicle has an 8 tonne load capacity supported on a purpose built frame mounted onto the wagon underframe.

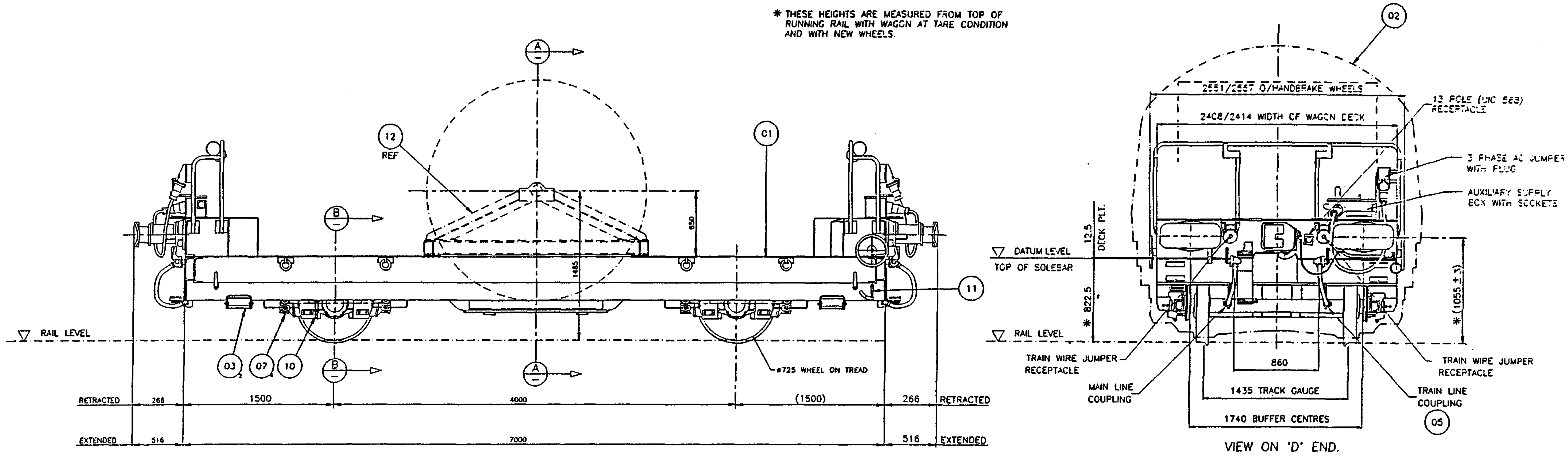
PRINCIPAL DIMENSIONS AND SETTINGS

Length over headstocks	7000 mm
Length over deck between headstocks	5536 mm
Length over extended buffers	8032 mm
Bogie Centres	7200 mm
Deck height (tare condition and new wheels)	835 mm
Height to C.L. buffing and drawgear tare	1055± 3 mm
Loading gauge	LUL drg SK 12212
Min horizontal curve	See section 5, page 14
Min vertical curve	400m rad
Max super elevation	150 mm
Max cant gradient	1 in 29
Service speed	30 mph
Maximum speed	45 mph
Regulator 'A' dimension	9 +0 - 4mm
VTA Changeover setting	7 ±1mm
Brake Block Clearance	6 +0 -1mm
Brake Cylinder Pressure - Tare	2.89 bar
Brake Cylinder Pressure - Laden	3.75 bar
Wheel Profile	LUL Drg. 57933

[redacted]

DRAWING No: 214/A/01/00/202	REV:	FIRST ANGLE PROJECTION	DO NOT SCALE - IF IN DOUBT ASK !	DIMENSIONS Over, to or between surfaces for which limits are not shown to be within the following tolerances.	MACHINED ± 0.25 mm	GENERAL FABRICATION	WELDING: Unless otherwise stated 1. All Welding to be in accordance with BS 5135 2. All Welds to be continuous 3. Fillet Welds to have leg length equal to smallest plate thickness	REMOVE ALL SHARP EDGES AND CORNERS	BEND RADII TO BE A MINIMUM OF TWICE MATERIAL THICKNESS UNLESS STATED OTHERWISE.

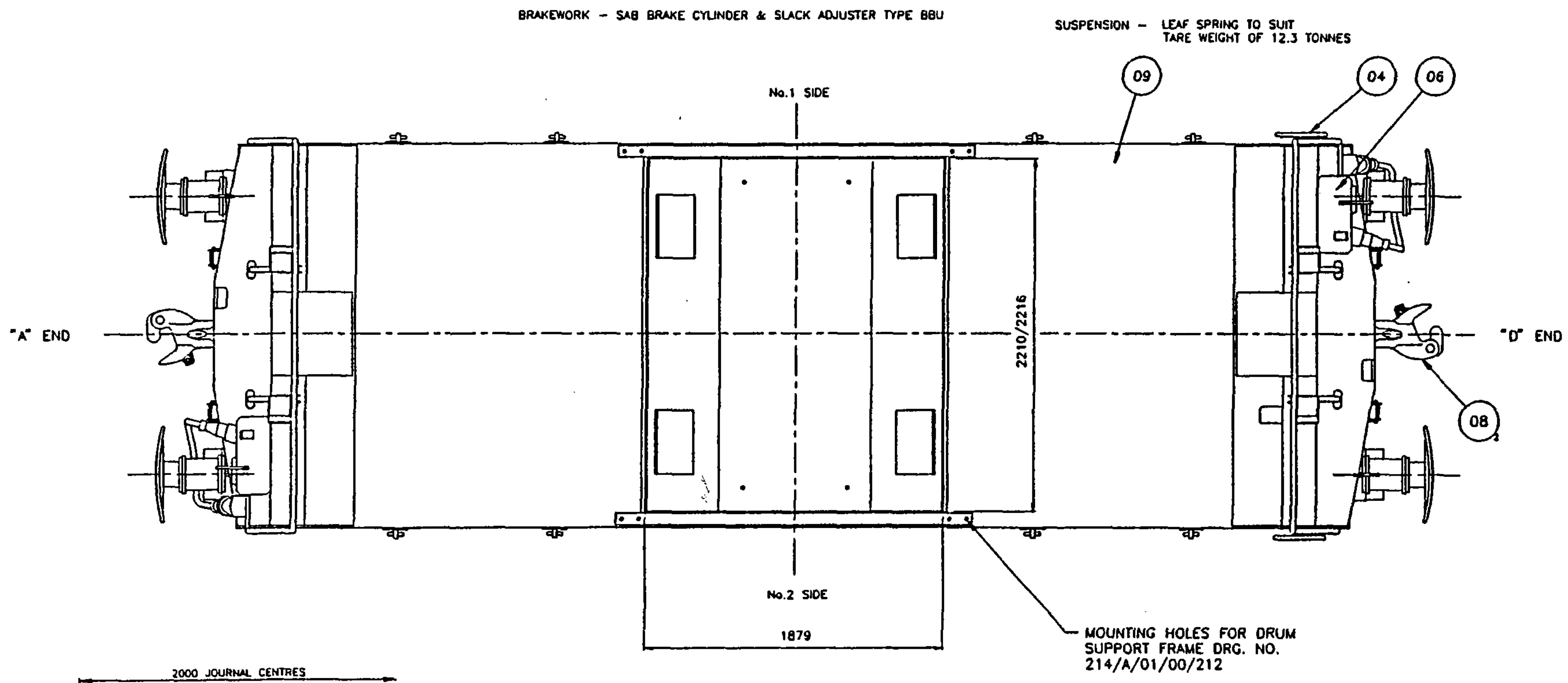
* THESE HEIGHTS ARE MEASURED FROM TOP OF RUNNING RAIL WITH WAGON AT TARE CONDITION AND WITH NEW WHEELS.

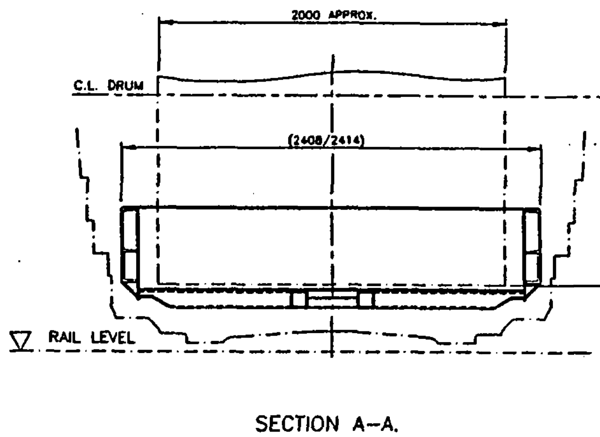


VIEW ON 'D' END.

BRAKEWORK - SAB BRAKE CYLINDER & SLACK ADJUSTER TYPE BBU

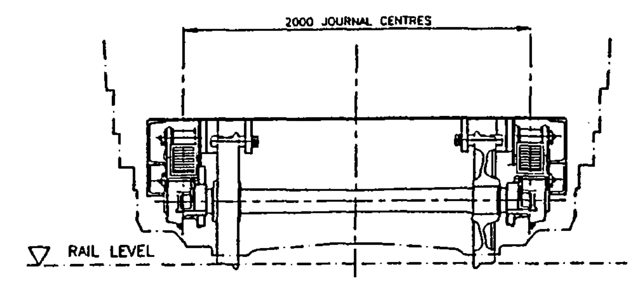
SUSPENSION - LEAF SPRING TO SUIT TARE WEIGHT OF 12.3 TONNES





SECTION A-A.

PRINCIPAL PARTICULARS	
TARE WEIGHT	12.3 TONNES MAXIMUM
CABLE DRUM WEIGHT	8 TONNES



SECTION B-B.

0 750 1500 2250

ITEM	DESCRIPTION	MAT'L	SPEC'N	REMARKS	WELL	FLAT	DRUM	WT. KG.
12	DRUM SUPPORT FRAME			214/A/01/00/211			1	
11	SCEWBRAKE INDICATOR ARRGT.			214/A/03/00/244			1	
10	"VTA" CHANGE OVER VALVE			214/A/03/00/243			1	
9	FLOORPLATE ASSEMBLY & DETAIL			214/A/02/00/233			1	
8	HEADSTOCK ARRANGEMENT			214/A/01/00/207			2	
7	SUSPENSION ARRANGEMENT			214/A/02/00/237			4	
6	CONDUIT ARRANGEMENT			214/A/11/00/205 214/A/11/00/204			1	
5	BRAKE PIPEWORK ARRANGEMENT			214/A/03/00/231 214/A/03/00/230 214/A/03/00/229			1	
4	SCREWBRAKE ARRANGEMENT			214/A/03/00/210			1	
3	POWER BRAKE ARRANGEMENT			214/A/03/00/208			2	
2	GAUGE & KINEMATIC PROFILE			214/A/05/00/202			1	
1	UNDERFRAME ARRANGEMENT			214/A/02/00/220			1	
					QTY. PER WAGON			

Rev.	Date	Description	By	Chkd.	App.	App.

[redacted]

Bombardier Prorail Limited, Horbury, Wakefield, West Yorkshire, WF4 5QH.

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Jubilee Line Extension Project Team
17 Osnaburgh Street - St. James's Park
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Title: GENERAL ARRANGEMENT ~ DRUM

Ref: B.P.L. Drg. no. 93065/01	Approved: T.P. GLD
Checked: 7-3-94	Approved: 7/3/94
DRAWING No: 214/A/01/00/202	REV:

Scale: 1:15	Date: 7.1.94	Drawn: DLM	CAD File Name:

DOC. NO. 93065 - OM / 0001	GENERAL SPECIFICATION OF THE WAGON	ISSUE 01

GENERAL DESCRIPTION

The wagon is a cable drum wagon supported by two axles. The vehicle has an 8 tonne load capacity supported on a purpose built frame mounted onto the wagon underframe.

PRINCIPAL DIMENSIONS AND SETTINGS

Length over headstocks	7000 mm
Length over deck between headstocks	5536 mm
Length over extended buffers	8032 mm
Bogie Centres	7200 mm
Deck height (tare condition and new wheels)	835 mm
Height to C.L. buffing and drawgear tare	1055± 3 mm
Loading gauge	LUL drg SK 12212
Min horizontal curve	See section 5, page 14
Min vertical curve	400m rad
Max super elevation	150 mm
Max cant gradient	1 in 29
Service speed	30 mph
Maximum speed	45 mph
Regulator 'A' dimension	9 +0 - 4mm
VTA Changeover setting	7 ±1mm
Brake Block Clearance	6 +0 -1mm
Brake Cylinder Pressure - Tare	2.89 bar
Brake Cylinder Pressure - Laden	3.75 bar
Wheel Profile	LUL Drg. 57933

[redacted]