

DRIVING INSTRUCTIONS FOR OPERATING 2,200 H.P.

TYPE 4 DIESEL HYDRAULIC LOCOMOTIVES

Nos. D.800-D.829, D.831, D.832 and D.866-D.870

LOCOMOTIVE DATA

Type	.....	.....	.....	4.
Wheel arrangement	.....	.....	.....	B.B.
Weight in running order	.....	.....	.....	78 tons (approx.)
Tractive effort at 27.6% adhesion	.....	.....	.....	48,200 lb.
Bogie centres	.....	.....	.....	37ft. 9in.
Bogie wheelbase	.....	.....	.....	10ft. 6in.
Total wheelbase	.....	.....	.....	48ft. 3in.
Wheel diameter	.....	.....	.....	3ft. 3½in. (new)
Maximum width overall	.....	.....	.....	8ft. 10in.
Maximum length overall	.....	.....	.....	60ft. 0in.
Maximum height overall	.....	.....	.....	13ft. 0¾in.
Minimum curve negotiable	.....	.....	.....	4½ chains

MAXIMUM PERMITTED SPEED

..... 90 m.p.h.

NOTE:- Locomotives not fitted with modified bogies are permitted a maximum speed of 80 m.p.h. and a notice to this effect is fitted in the cab.

Fuel tank (engine and steam generator)	.....	.....	.....	800 gallons.
Lubricating oil sump and heat exchanger (2)	.....	.....	.....	40 gallons (each).

Coolant:—

	<i>Each engine (2)</i>	<i>Total</i>
<i>Each radiator, header tank and piping (2)</i> 89 gallons	21 gallons	110 gallons (each)
Transmission gearbox and heat exchanger (2)	25 gallons (each).
Final drive gearbox (4)	1¾ gallons (each).
Boiler water tank	940 gallons.
Brakes	Vacuum controlled straight air, and hand.
Sanding	Pneumatic.

POWER EQUIPMENT

12 cylinder diesel engine (2)	.....	Maybach M.D.650.
Direction of rotation	.....	Anti-clockwise looking on drive end.
L.H. bank of cylinders	.....	1-6
R.H. bank of cylinders	.....	7-12
		} Looking on drive end.

Cylinder bore and stroke	.....	185mm. x 200mm.
Cylinder firing order	.....	12-1-8-5-10-3-7-6-11-2-9-4.
Combined fuel pump injector		L'Orange IV injector.
Injector timing	.....	8° before T.D.C.
Pressure at which fuel injector nozzle should be set	.....	1,850 lb./sq. in. (126 atmospheres).
Dynostarter (2)	.....	Brown Boveri, G.C.a 104-S (20.3 kw. on D.800-D.802) (17.3 kw. on D.803-D.829/D.831/D.832, D.866-D.870).
Hydraulic Transmissions (2)		Mekydro K.104 U.
Cardan shafts (power drives) (6)	.....	Maybach.
Cardan shafts (to dynostarter) (2)	.....	Hardy Spicer (with Layrub coupling).
Battery	.....	D.P. Battery Co. Ltd. 56 cells RSKB 276 (D.800-D.802). 48 cells RSKB 276 (D.803-D.829/D.831/D.832 and D.866-D.870).
Lighting and starting circuit		130 volts (D.800-D.802). 110 volts (D.803-D.829/D.831, D.832 and D.866-D.870).
Air compressor (1)	.....	Laycock-Knorr VV 100/100.
Vacuum exhauster (2)	.....	Westinghouse 4V110 L.

GAUGES AND INDICATORS FITTED IN EACH CAB

(a) Gauges

1. Duplex vacuum gauge.
2. Main air reservoir pressure gauge.
3. Brake cylinder air pressure gauge (Bogie 1 and Bogie 2).
4. Speedometer.
5. Engine speed moment contactor (shows speed of near engine only).
6. Cooling water temperature moment contactor (shows temperature of near engine only).
7. Transmission oil temperature moment contactor (shows temperature of near transmission only).
8. Voltmeter
9. Ammeter.
10. C.W.A. steam pressure gauge.

(b) Indicator Lights

1. Deadman's indicator light (red "D").
2. Engine speed regulator indicator light (red "R").
3. Transmission changing indicator light (red "T")—momentarily indicates when converter is disengaged during gear ratio changes.

4. Engine stopped, OR, reverted to idling due to a coolant or transmission oil excess temperature fault, indicator light (red "E").
5. Directional gears not changed indicator lights (yellow GI and GII).
6. Low cooling water level indicator light (yellow).
7. Cooling water excess temperature indicator light (yellow).
8. Engine lubricating oil temperature indicator light (NOT IN USE).
9. Transmission fault indicator light (yellow).
10. Transmission oil excess temperature indicator light (yellow).
11. Engine overspeed indicator light (yellow).

(c) Code Lights

1. White code repeater light (4 on D.800-D.812, 5 on D.813 onwards).
2. Red code repeater light (1).

IN EACH ENGINE COMPARTMENT

Gauges

1. Engine oil pressure gauge.
2. Thermometer—engine cooling water inlet.
3. Thermometer—engine cooling water outlet.
4. Thermometer—engine lubricating oil.
5. Watchman heater fuel pressure gauge (D.802 onwards).

IN BOILER/STEAM GENERATOR COMPARTMENT

1. Fuel contents gauge (1).
2. Boiler/steam generator feed water contents gauge (1).
3. Radiator header tank contents gauge (2).

ON SUPERSTRUCTURE SIDES

1. Fuel oil contents gauge at each filling point (2).
2. Main fire extinguisher controls (one each side).

SWITCHES IN EACH CAB

(a) Driver's Desk

1. Power.
2. Compressor.
3. Exhauster.
4. Fire alarm bell.
5. Passenger/Goods (D.818 onward).
6. Instrument (light switch).
7. Sanding.

8. Cab lights.
9. Cab heater.
10. Window demister.
11. Train heating emergency stop (D.803 onward).
12. Groups I and II (Stop/Off/On/Start).

(b) **Cubicle I (Top)**

1. Thermostat shorting switch for cold starting.
2. Engine and transmission isolater (local control only/multiple control/local control out).
3. Indicator light test switch (D.803 onward).
4. Vacuum governor shorting switch (sealed).
5. Engine speed supervision shorting switch (sealed).
6. Transmission oil temperature shorting switch (sealed).
7. Cooling water temperature shorting switch (sealed).
8. Cooling water level shorting switch (sealed).
9. Timing relay—engine start shorting switch (sealed).
10. Timing relay—transmission shorting switch (sealed).
11. Engine speed regulator shorting switch (sealed).
12. Starting shorting switch (sealed).
13. Changeover relay shorting switch (sealed).
14. Locomotive brake release switch.
15. 1st/2nd locomotive switch.
16. Single exhauster cut-out switch (D.867-D.870).

(c) **Cubicle I (Front)**

1. Engine speed moment contactor main switch.
2. Cooling water temperature moment contactor main switch.
3. Transmission oil temperature moment contactor main switch.
4. Engine speed moment contactor test button.
5. Cooling water temperature moment contactor test button.
6. Transmission oil temperature moment contactor test button.
7. Engine speed moment contactor reset button.
8. Cooling water temperature moment contactor reset button.
9. Transmission oil temperature moment contactor reset button.
10. Transmission fault reset button (Inside cubicle behind moment contactors).

Miniature circuit breakers labelled as follows.

Top row:-

11. Code lamps
12. Engine room and cab rear lights
13. Fuel level units ("A" cab only).

14. Alarm bell ("B" cab only).
15. Instruments.
16. Inverter for moment contacters.
17. Main control.
18. Indicating and starting control circuits.
19. Engine run solenoid.
20. Speed regulator motor.
21. Electric cab heaters.
22. Food warmer.
23. Battery emergency connection ("A" cab only).
NOTE: The battery emergency connection miniature circuit breaker is normally OPEN and should only be closed for emergency use of the battery when working in multiple.
24. Desk, nose and cab front lights.

Bottom row:-

25. Reversing solenoids.
26. Cooling water circulating pumps (D.800 and D.801 only) ("B" cab only) OR Cooling water heating unit (D.802 onward) ("B" cab only).
27. Lubricating oil priming pump.
28. Fuel oil pump and control lubricating oil pump.
29. Fuel oil pump.
30. Cooling water circulating pump (D.800 and D.801 only) OR train heating boiler D.803-D.812 and D.866-D.870 only ("B" cab only).
31. Changeover relay and voltmeter.
32. Changeover relay.
33. Voltage regulator.
34. Voltage regulator.
35. Excitation dynostarter.
36. Cab heater, window demister.
37. Sockets.

(d) Cubicle I (Front right)

1. Positive grounding test switch.
2. Negative grounding test switch.
3. Battery/dynostarter voltage switch.

(e) Right hand side

1. Deadman's holdover button.
2. Depot supply selector switch (on cubicle II "A" only).
3. Lighting changeover switch (on cubicle II "A" cab only).
4. Main battery switch (in cubicle II "B" cab only).
5. Dynostarter circuit breaker (in cubicle II).

(f) Left hand side

1. Marker light switches (5 on D.800-D.812, 2 on D.813 onwards).
2. Train classification light switch (1) (D.813 onwards).

(g) Back of Cab

1. Lighting switches.
2. Heater switches.
3. Transformer/rectifier isolating switch ("A" cab only) (where fitted).
4. Transformer/rectifier voltage selection switch ("A" cab only).
5. Pre-heating battery supply miniature circuit breaker (2) ("A" cab only) (D.800-D.801).
6. Pre/post heating depot supply miniature circuit breaker (2) ("A" cab only) (D.800-D.801).
7. Pre-heating battery supply switch (2) ("A" cab only) (D.802).
8. Pre/post heating depot supply switches (2) ("A" cab only) (D.802).
9. Cooker switch.

CONTROLS IN EACH CAB

(a) At Driver's Desk

1. Forward/reverse handle (1 handle per locomotive).
2. Power handle (press down for Deadman).
3. Straight air brake handle.
4. Vacuum brake handle.
5. Driver's 2nd locomotive holdover press.
6. Horn control lever.
7. Deadman's pedal.
8. Windscreen wiper control valves (2).
9. A.W.S. reset handle.
10. Passenger/goods changeover cock (D.800-D.817).
11. Control for heater.
12. A.W.S. IN USE/NOT IN USE cock.

(b) Isolating Devices and Controls on Co-Driver's Side

1. Horn control lever (D.818 onwards).
2. Deadman's isolating cock ("B" cab only) (sealed).
3. E.A.B. valve isolating diaphragm ("A" cab only).

(c) Controls on Cab Bulkhead

1. Handbrake.
2. Fire extinguisher control pull handle.

SWITCHES IN ENGINE AND BOILER/STEAM GENERATOR COMPARTMENTS

1. Engine room and boiler/steam generator room light switches.
2. Portable light sockets.
3. Main breaker switch for steam generator (D.813-D.829, D.831, D.832).
4. Fire alarm test button (boiler/steam generator compartment).
5. Lubricating oil priming pump button.
6. Preheating battery supply switch (D.803 onward).
7. Preheating battery supply switch (D.803 onward).

RE-SETTING CIRCUIT BREAKERS

In the event of a circuit breaker tripping, re-set by operating switch.

FUSES FITTED

<i>Equipment</i>	<i>Capacity</i>	<i>Position</i>
Battery main (2)	200 A	One at each end of battery box
Battery charging circuit	125 A	Cubicle II "B" cab
Compressor	50 A	Cubicle II "A" cab
Exhausters (2)	50 A	Cubicle II one in each cab
Heating (boiler/steam generator)	35 A	Cubicle II "A" cab
Lighting	25 A	Cubicle II "A" cab
Transformer/rectifier	10 A	Isolating switch "A" cab or on unit in "A" engine room
Watchman heater (4)	15 A	Two on each heater panel (D.802 onward)
Fuel contents gauge	250 milliamp	Fuel contents gauge power unit in "A" cooling compartment
Lighting transformer	10 A	"A" cab nose
Spanner Mk. I and IB train heating boiler (D.800-D.812, D.866-D.870)	30 A (1) 20 A (1) 5 A (1)	Boiler panel
Spanner Mk. III train boiler (D.818 only)	30 A (1) 20 A (1) 5 A (2)	Boiler panel
Stones O.K. 4616 train heating steam generator (D.813-D.817, D.819-D.829, D.831, D.832)	15 A (4)	Generator control panel

