

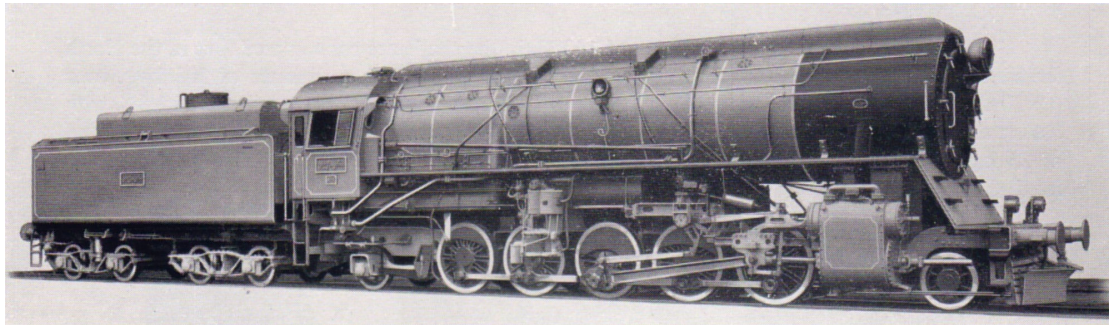
# IRANIAN STATE RAILWAYS



4 ft. 8½ in. Gauge

1952-53

2-10-2 (52)



Cylinders.....	(2) 24.01 in. Diam. x 26 in. Stroke	Maximum Axleload.....	16.75 tons
Diameter Coupled Wheels.....	4 ft. 3 in.	Weight :	
Working Pressure.....	199 lb.	Engine in Working Order.....	108.5 "
Tractive Effort at 85% Pressure.....	49,800 lb.	Tender " " .....	67.3 "
		Total " " .....	175.8 "

The 2-10-2 freight locomotive illustrated above, one of -64 built in 1952 and 1953 for the Iranian State Railways, is an entirely new design and is one of the most powerful engines ever sent to the Middle East.

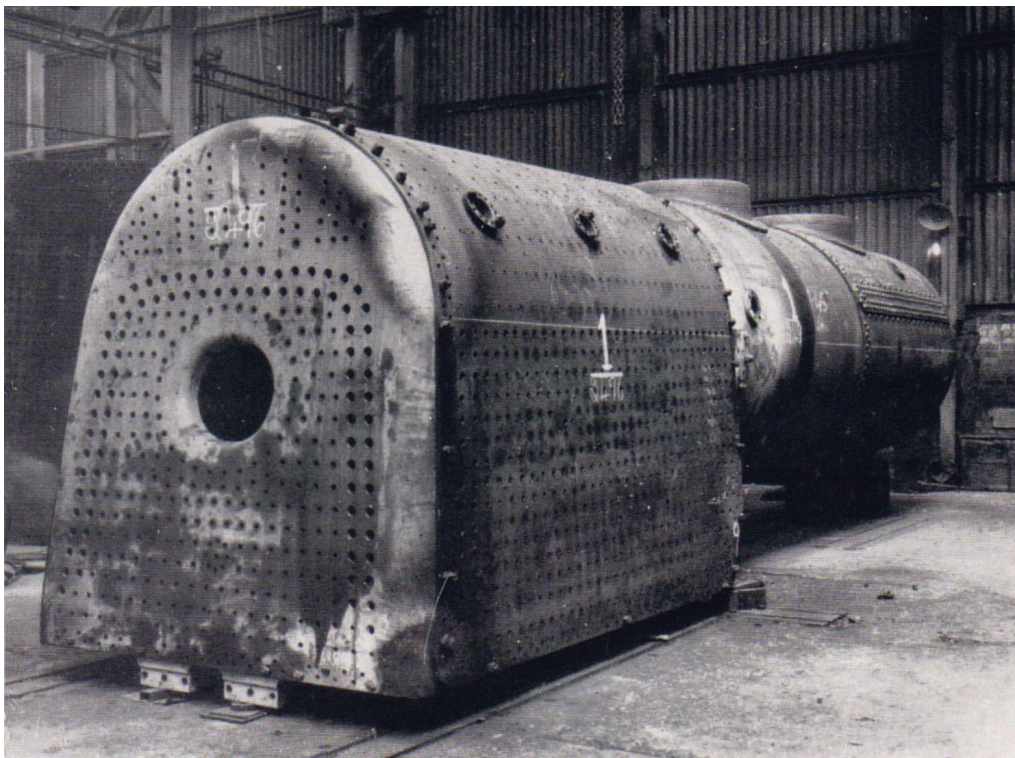


*2-10-2  
Locomotives  
being steamed at  
Bandar  
Shahpur*



The Trans-Iranian Railway, connecting Bandar Shahpur on the Persian Gulf with Teheran, the capital, and Bandar Shah on the Caspian Sea, is one of the world's greatest railway engineering achievements, and these locomotives have to stand up to operating conditions perhaps unequalled in their difficulty.

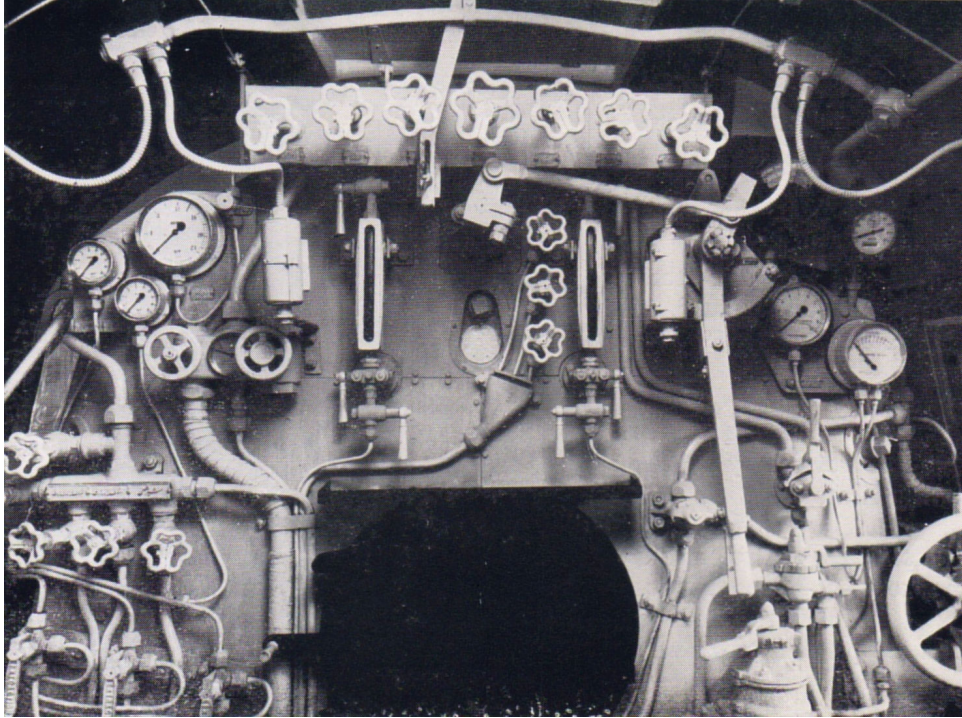
On the Southern plain temperatures of 140°F. in the shade are encountered, but in the North the winter conditions are most rigorous. From Andimeshk to Doroud, a distance of 208 kms. over the Elvend Mountains, there are innumerable tunnels and almost continuous gradients of 1.5% with curves and reverse curves as sharp at 180 metres radius. The specification laid it down that a speed of 25 k.p.h. should be maintained with trains of 600 tons on this section, and this condition was fulfilled with ease.



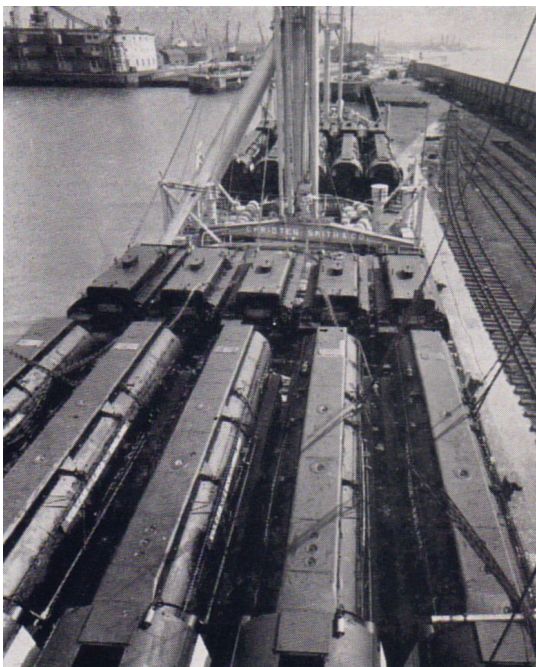
*One of the Boilers in course of construction*

North of Teheran the railway rises to a height of over 7,000 ft. when crossing the Elburz range and here the terrain is even stiffer, and includes a section 66 kms. long of continuous 2.8% gradient over which trains of 300 tons have to be handled in all weathers.

Built entirely to metric dimensions and arranged for oil firing, these engines have a tractive effort of 49,800 lb. at 85% pressure and are provided with large boilers having a total evaporative heating surface of 2,731.2 sq. ft.



*View inside  
the Cab of one  
of the 2-10-2  
Locomotives*



*2-10-2 Locomotives on board ship at Liverpool*

The firebox is round-topped with a welded steel inner shell and the superheater has 36 elements. There are two domes, the front one housing tray and baffles for water purification, and the rear one an Owen's double beat regulator. The large capacity sandboxes are also located on top of the boiler.

The rolled steel bar frames are 110 mm. (4-33 in.) thick and extend the full length of the engine bed and are adequately stayed throughout by steel castings and fabricated vertical stretchers.

Forged steel pedestal guides are provided, fitted with renewable manganese steel liners which work against similar liners in the axleboxes; these latter are of cast steel with gunmetal bushes lined with white metal and they are provided with Armstrong oilers in the keeps.



The springing is of the overhead type compensated in two groups and each cylinder is cast integral with half the smokebox saddle.

The leading truck has a cannon type axlebox fitted with Timken roller-bearings and these are also applied to the outside-bearing axleboxes of the radial arm trailing truck. All the coupled wheel centres are of the S.C.O.A.-P. type.

Lubrication is by oil throughout and that of the valves and pistons is provided by a 12 feed Wakefield mechanical lubricator.

The Westinghouse brake equipment is fed by a powerful 7 in. cross-compound air compressor mounted under the platform, and both driver's automatic and independent brake valves are provided.



*Unloading a 2-JO-2 Locomotive at Bandar Shahpur*

Other accessories include two Davies & Metcalfe live steam injectors, three Ross Pop safety valves, Klinger water gauges, three

Williams type steam-operated blow-off cocks, steam-operated cylinder draincocks, air-operated sanding valves, Laycock steam-heating valve, Teloc speed recorder, and steam chest pressure gauge with pyrometer indicator.

The Stone's electric lighting equipment is exceptionally complete and, in addition to the usual head, tail, and other lights, a searchlight is provided on each side of the boiler for use at stations and on the curves in the mountains.

The tender tanks are of welded construction carried on an all-welded underframe and the water and oil fuel capacities are 6,600 gallons and 8.4 tons respectively.

The two diamond-framed tender bogies are also fitted with Timken roller-bearing axleboxes.

The locomotives were all shipped in Messrs. Belships' vessels and unloaded at Bandar Shahpur jetty where in spite of a coupled wheelbase of 19 ft. 84 in. they were hauled round a 120 metre radius curve without difficulty.