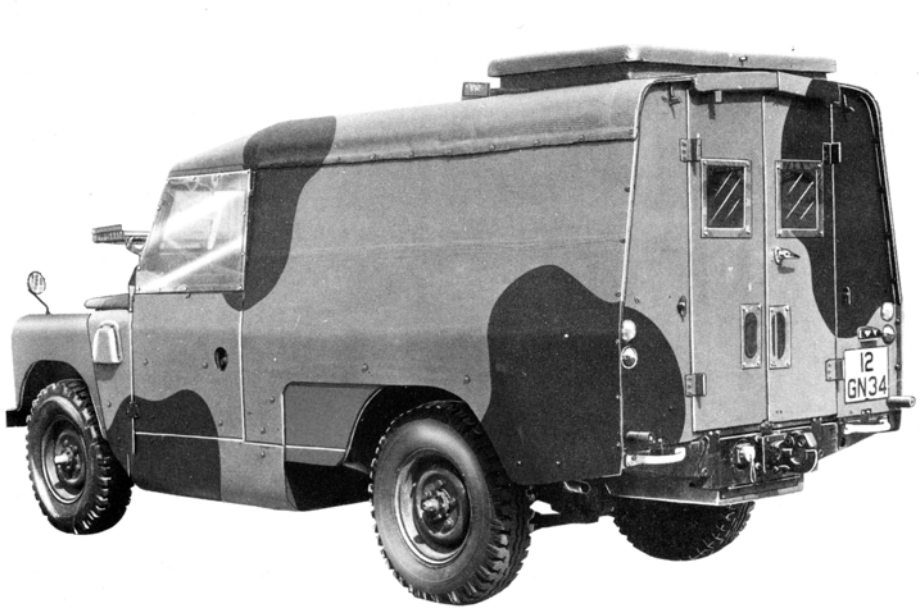
SHORLAND PROTECTION FROM GUNFIRE

Literature for Shorlands Mark 1 and Mark 2 and indeed the early Mark 3, made no specific claims as to the degree of protection offered against small arms fire and roadside bombs. The MOD required this information before deciding whether to equip the UDR (Ulster Defence Regiment) with the new Shorland Mark 3 and they also required reliability trials to be undertaken. The UDR was already using some 15 Shorlands Mark 1 that had previously been in service with the RUC (Royal Ulster Constabulary).

In June 1971 MVEE (Military Vehicles & Engineering Establishment) were directed to draw up the requirements for such trials, which would consist of an automotive reliability trial and quite separately a comparative immunity to attack trial. On 8 July it was decided that the cost of an automotive reliability trial was not justified in relation to the cost of purchasing the new Shorlands. Instead the manufacturer was to provide warranty clauses to guarantee the automotive reliability.

On 8 July the requirements for ballistic tests to be conducted in Northern Ireland were drawn up by the Weapons Trials Branch of MVEE. Three vehicle types were to be tested, Shorlands Mark 1 and Mark 2 and a ¾ Ton Land Rover fitted with VPK (Vehicle Protection Kit consisting of *Makrolon* panels over the windows and GRP – Glass Reinforced Plastic over the body).



¾ Ton Rover fitted with VPK

These three vehicles were to be subjected to a range of attacks from SMG (Sub-Machine Gun) Sterling 9 mm and/or Thomson, 7.62 mm rifle and GPMG (General Purpose Machine Gun). In addition there would be attacks using nail bombs, petrol bombs and Claymore mines employing 10 of each type. These tests were not just to compare the protection afforded by the two Shorlands but also to compare the results with the VPK Land Rover in terms of cost effectiveness and weight of the GRP.

The trials were conducted on 26-28 July but in a more restrained way. It was decided to omit the VPK Land Rover from the trial and to limit the attack on the Shorlands. The Mark 1 was provided by HQ Northern Ireland and the Mark 3 from Short Bros and Harland Ltd. Neither vehicle was to be tested to destruction and indeed the lenders stipulated that there should be minimal damage.

This ruled out the tests with Claymore mines, nail bombs and petrol bombs. The Shorlands themselves were only subjected to the Service FN Rifle firing round 7.62 mm Ball at 50 metres. In these tests the side armour of each Shorland was not defeated.

The Shorland Mark 3 after testing (Photo via Geoff Fletcher)

The Shorland Mark 3 showing the 50 metre strike to the right of the target cross & deliberate hits at the door edge (Photo via Geoff Fletcher)

The Mark 3 target undergoing scrutiny. Note the motor trade plates 108 OI allocated to Shorts Bros & Harland Ltd (Photo via Geoff Fletcher)

Further testing of armour penetration was conducted on one foot square examples of the two types of armour plate used in the Shorlands.

Mark 1 armour 7.25 mm thick Brinell Hardness 363
Mark 3 armour 8.25 mm thick Brinell Hardness 415

On the Mark 3 armour even down to a range of 10 metres the armour was not defeated.

Plate of 415 Brinell Harness as used on the Shorland Mark 3. Viewed from the back showing no penetration.

The same plate viewed from the impact side.

The Mark 1 armour did not do so well, at a range of 50 metres with approximately 26 hits, 7 penetrated the plate and 4 cracked and bulged the armour. At 10 metres 2 hits produced 2 defeats of the plate.

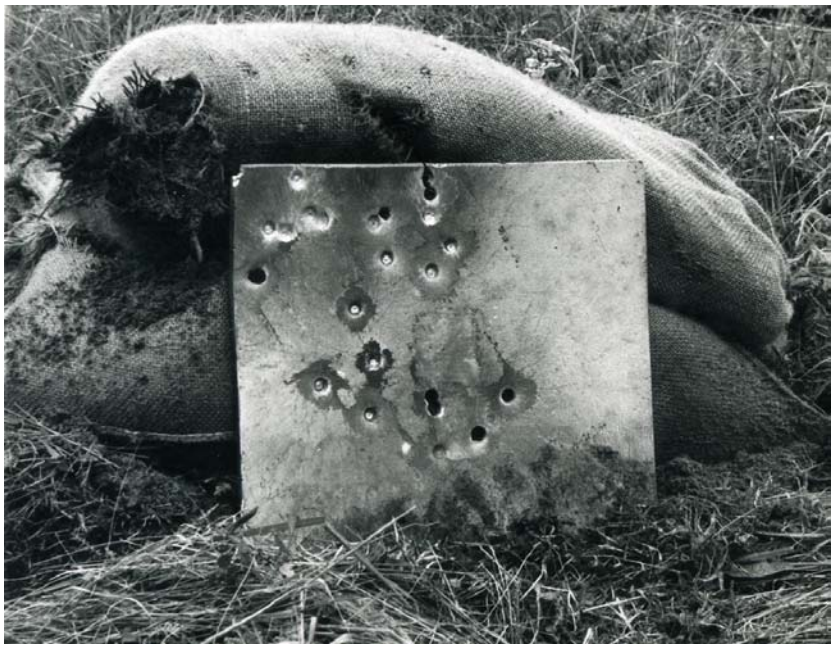
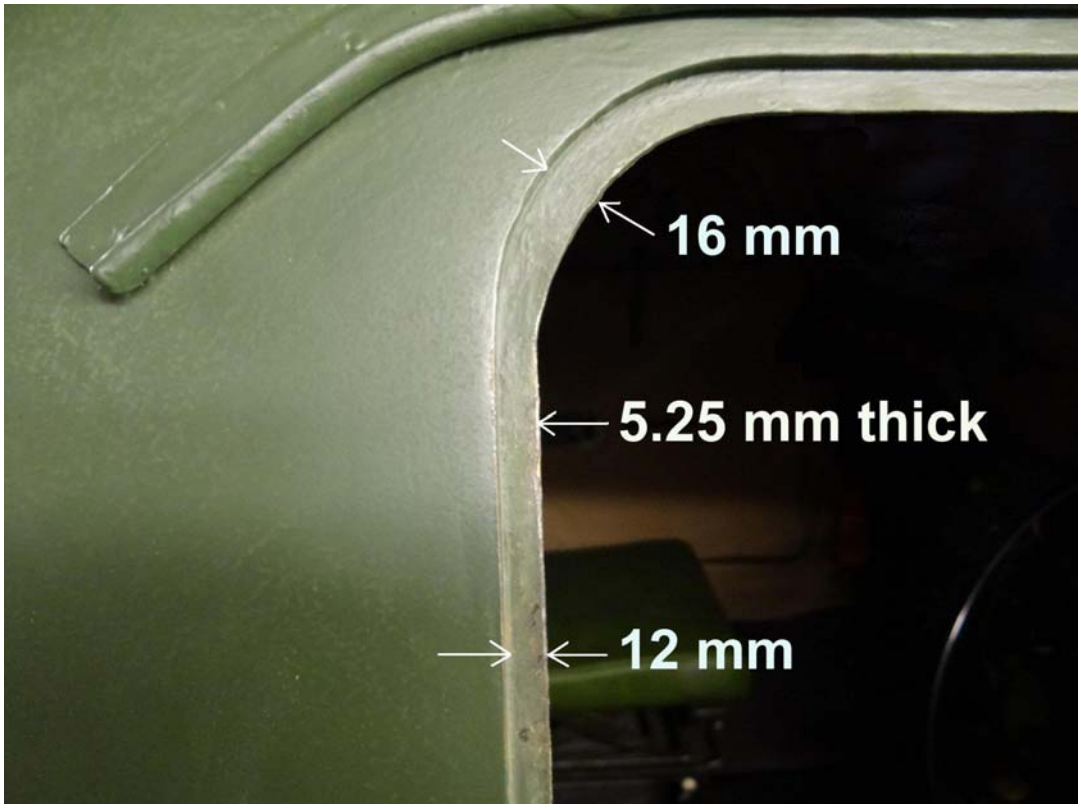


Plate of 363 Brinell Hardness as used on the Shorland Mark 1.
Viewed from the front showing significant damage.

In both vehicles the door frames were provided with 5.25 mm steel edging to provide a trap against the direct entry of bullet splash. The breadth of this edging was no less than 12 mm.



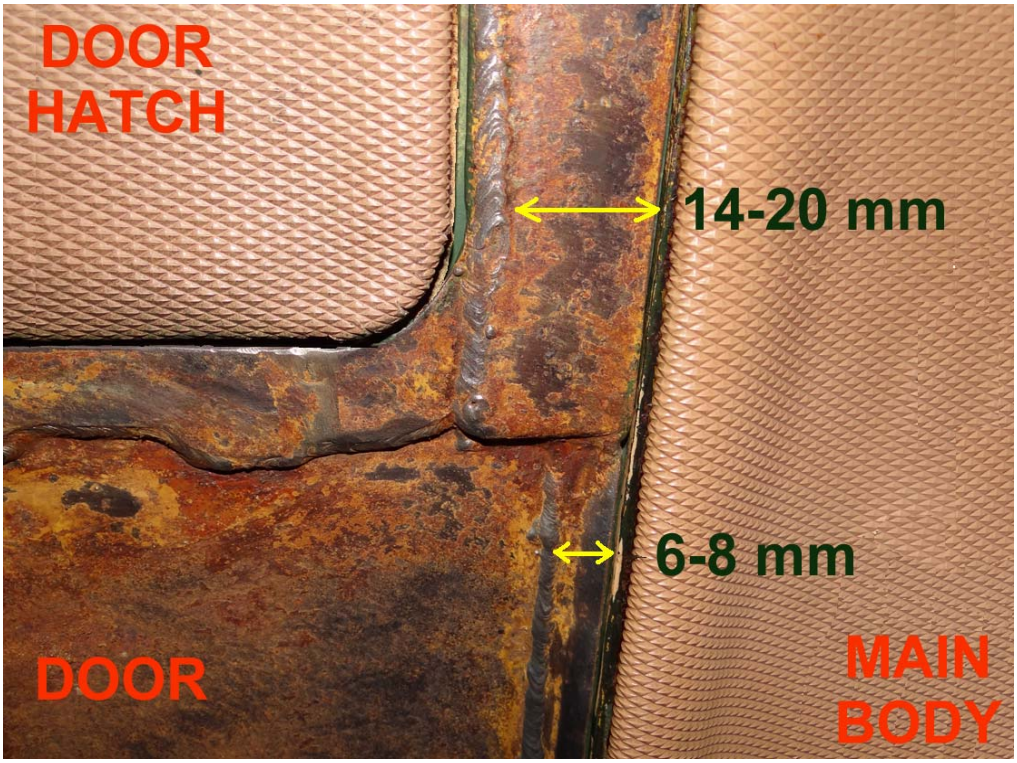
However this does not provide protection against the effect of bullet splash being deflected through 90 degrees and causing injury. To protect against this the entire inside perimeter of the door has a splash trap consisting of a 2 mm steel flange.

Tests for bullet splash ingress at the side door edges were conducted by firing at both Shorlands at a range of 50 metres. The proper MVEE splash witness cards were unavailable; so this was overcome by attaching stiff Stationery Office card to the door edge under attack and fixing a sheet of 18 gauge steel spaced 50 mm behind.

Both Shorlands exhibited some bullet splash ingress with lead fragments perforating the witness card. In the case of the Mark 1, which received 3 hits in the door edge, all of these produced ingress which coincided with areas where the door splash trap was thinner than on the rest of the door. Similar ingress was identified on the Mark 3 as well.

The report found that in both Shorlands the effective splash trap edging in the area of the hits was no more than 9 mm and as little as 6 mm. The recommendation was that the protection should no be less than 9 mm. The writers of the report seem to have been unaware that the upper part of the door has a deeper box-like splash guard varying between 14-20 mm determined by the welds for the hatch.

The depth of the splash guard around the rest of the door it is 6-8 mm determined by the depth of weld spread. With the *Trakmark* lining and backing foam removed, it can be seen that the top of the door deliberately provides far better protection for the head and neck than some of the areas tested.



It seems an oversight that the splash ingress sites between the uppermost and lower door splash guards were not specifically targeted and compared. This was presumably because nobody had identified that the guards, although of the same 2 mm thickness, were of a different depth. There were also splash guards around the rear escape hatch and door hatches of the shallower type.

Other aspects of the Shorland's protection were not tested. The turret was manufactured by Short Bros and Harland, although it clearly was inspired by the design of the turret on a Ferret armoured car. As the front mantlet is very similar to that of the Ferret it was assumed that the protection would be adequate. Although it was acknowledged that bullet splash into the gun aperture was a risk.

The risk was minimised to a head-on assault as the aperture was protected by side cheek plates.

The front vision blocks, consisting of 9 layers of laminated glass, were made to the thickness and specification for British Service vehicles it was assumed it would give adequate protection against a direct hit from 7.62 mm Ball.

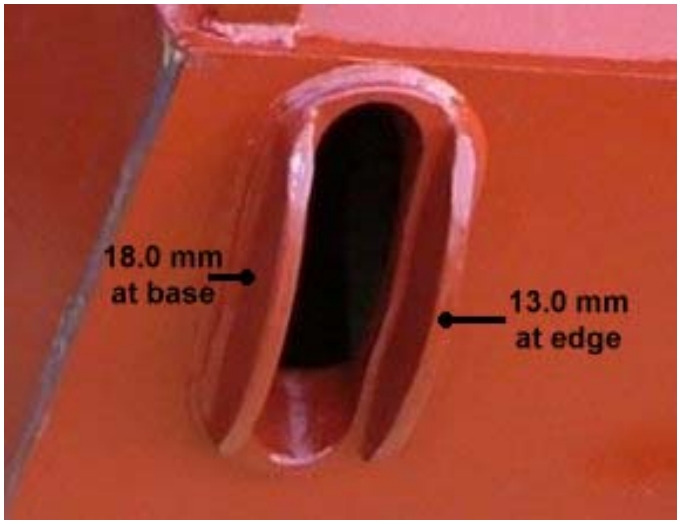
It was felt that the both Marks should provide protection from nail bombs, petrol bombs and roadside bombs. But the protection against a bomb underneath the vehicle could not be assessed without trials.

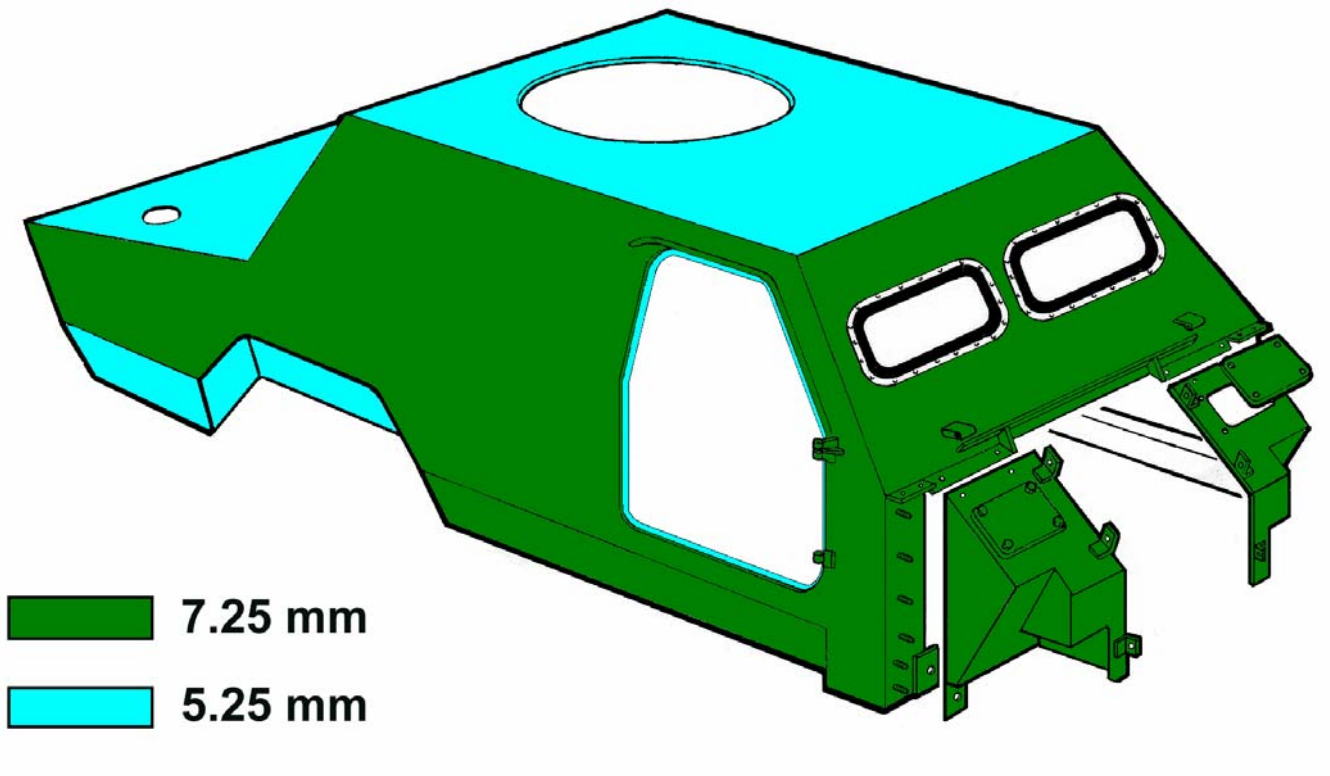
It was concluded the Mark 1 will probably provide protection against 7.26 mm Ball from GPMG or FN Rifle at 150 metres range and the Mark 3 will provide protection at 50 metres range. This was translated into Mark 3 literature as 47 metres as it had been assumed that the trial range was 50 yards, but it was in fact 50 metres and indeed down to 10 metres.

This success seemed to be missed in the Mark 3 promotional material but was picked up in the Series 5 literature that quoted British Army trials proved protection down to 25 yards.

Although the armour quoted in these trials was either 7.25 mm or 8.25 mm, it should be realised that not all the armour on the Shorland is that thick. The quoted thickness for the armour refers to the main body shell; it does not refer to the roof, much of the rear end, the engine compartment, the rear lower sloped armour and wheel arches which are all 5.25 mm thick.

The turret armour thickness is the same as the main vehicle body with the exception of the turret mantlet which is 10 mm thick. The diagrams below relate to measurements of armour thickness for the Shorland Mark 1.

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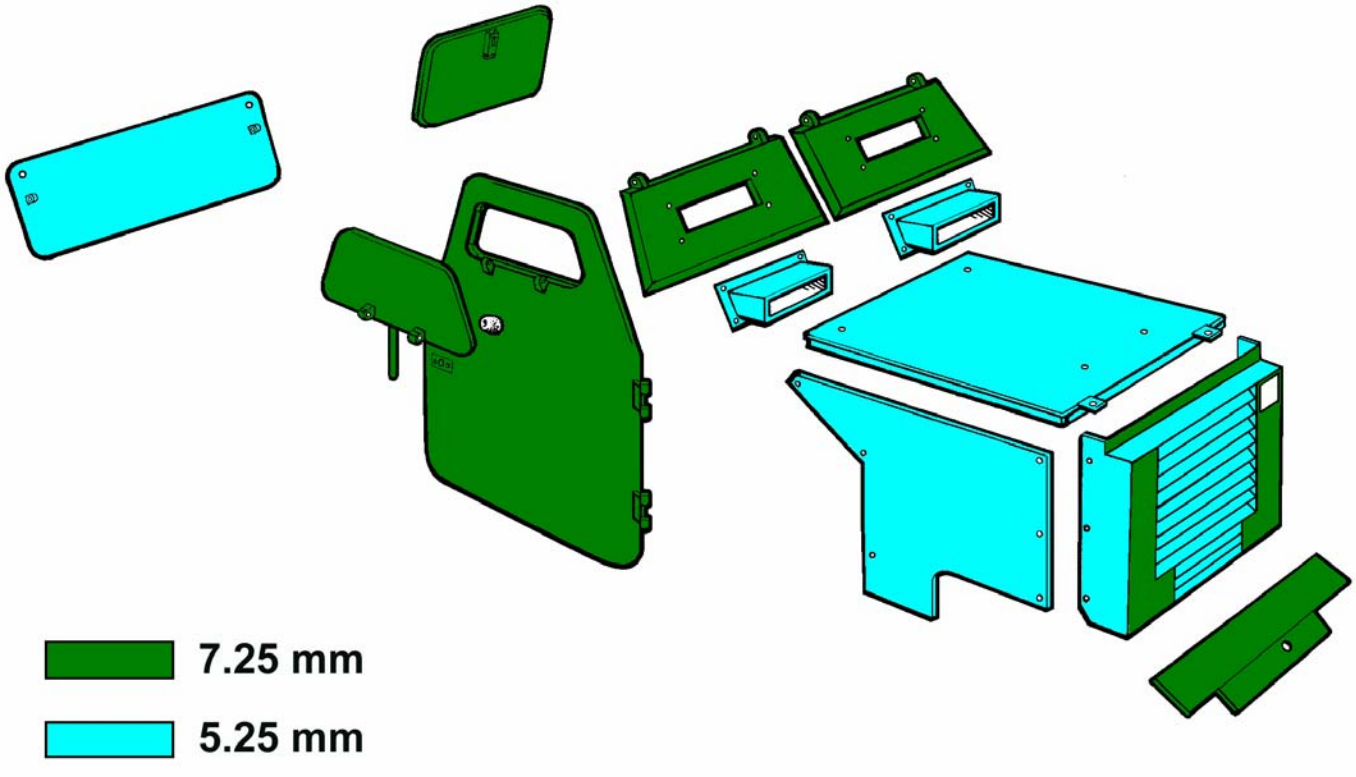
5.25 mm


7.25 mm
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