

Armored Trains 11/07/04 © Steven Lorenz

Introduction. Armored trains were used by both sides on the Eastern Front of WWII. Because rail vehicles varied from large engines and multi-turreted armored railcars to light armored cars with rail wheels new special rules have been added to the standard armor rules of **Panzer War**. Included with these rules are a compilation of data tables that cover many common engines and armored cars. Most of the armored trains here are intended to be for tactical battles and skirmishes between armored trains and partisans, or tanks and infantry of front line units. Super heavy railroad guns, flak trains and other strategic uses of trains are not covered.

1.0 Scale. Since $\frac{1}{85}$ scale (6mm) models are greatly out of proportion with 1:2000 ground scale some special considerations must be undertaken. At this scale the train models are seven times too large for the space they take up. To measure distance to sight or target from railcar to target would make the scale problem worse. One way to handle this is to measure all distances from either the center railcar model or the engine model to the target. Usually the engine of an armored train will be the center vehicle so this is no problem. At this scale a model can represent seven cars in length.

Nomenclature - English readers will see I'm using the American reference for car for what they would call a wagon.

2.0. Communications. The controlling element of a train will normally be either in the engine's cab or in a command car. Some kind of communication system is usually present in the train. Usually a phone line or voice tube is connected among the cars. Sometimes observers with radios are detached from the train to act as artillery spotters. If a car or section of a car of a train is destroyed this breaks communication beyond that point.

2.1. Orders for movement changes must be given in the **Orders** phase. For initiative purposes trains already in motion will be considered to be moving full. Thus a moving train will always lose initiative and move before other moving vehicles. Except if an enemy armored train is also in the game, then dice for initiative between them.

2.2. Orders for trains only consist of changing the speed of a train or having it remain at the same level. As such the player must write down the ending speed (for the turn) of the train. In addition the first turn the armor train appears on the table the owning player must write down the starting speed.

2.3. Even if a train or train moving element is no longer under the command of the player its speed must be kept

track of to regulate its movement.

3.0. Movement. Train movement rules are different than tank movement rules. Trains only move on tracks. Trains in motion are considered to remain moving from turn to turn. (Unlike tanks that are assumed to make short halts to fire.) Trains may only change speed by a fixed amount from turn to turn. Train cars behind the engine must be coupled to the engine to be moved (pulled) by it. Train cars in front of the engine need not be properly coupled to the engine to be pushed by it. However, cars not coupled are not considered part of the train military unit for command or morale purposes.

3.0.1. Front and Rear. For the purposes of motion the *front* of a train means in the direction of motion irrespective of direction the engine or individual cars are facing.

3.0.2. Trains are composed of at least one engine or motorized car and a number of towed cars. An engine will be able to move under its own power while towed cars must be joined to an engine before they can start moving. The rules allow for pushing or towing a total of up to 10 towed cars per engine. Certain armored trolleys or armored draisines can move on their own. These vary from large powerful multi-turreted behemoths to light armored cars fitted with rail wheels. Most only have power enough to move or pull one heavy towed car or several light flatcars. Often these are used to scout the rails ahead of the armored train. On the other hand several trolleys/draisines can be joined together to form a train of their own.

3.1. The distance a train is allowed to move in a turn is determined by the average speed at which the train travels during the turn. If there is no change of speed during the turn then the distance traveled is just that, the distance is the speed. If the speed changes then the distance is the average of the starting speed and the ending speeds. For example if the speed of the train at the start of the turn is 200 and the train is ordered to increase speed to 300 the distance traveled is the average which is 250.

Front			Side 1		Side 2	
10	Stack	3	Boiler	4r	Cab	3
9	Boiler	3	Boiler	3r	Cab	3
8	Boiler	3	Boiler	3	Cab	3
7	Boiler	3	Boiler	3	Cab	3
6	Boiler	3	Boiler	3r	Cab	3
5	Boiler	3	Boiler	4r	Boiler	4r
4	Hull	3	Hull	4	Hull	4
3	Chassis	4	Chassis	4	Chassis	4
2	Wheel	6	Wheel	6	Wheel	6
1	Wheel	3	Wheel	3	Wheel	3
	Top	2				
size 4						
Speed 100, 300			1-8-0 WDr=2		1 x 7.62 MG AA	

engine power maximum speed

3.1.1. The engine speed factors are listed on the engine information table as something like '[100 .. 500]'. The first number (100) is the power of acceleration (speed increase) that

the engine can make from one turn to the next. The last number (500) is the maximum speed the engine can ever have.

Example: Turn 1. A train with speed factors of '100 .. 470' has moved 200.

Turn 2. The player now increases the speed of the train to 300. Train travels a total distance of 250.

Turn 3. The train again increases speed, now to 400. The distance the train model moves is 350.

Turn 4. The train can increase its speed more but it can now only go to 470, its maximum. (Harder math but the train moves 435.

Turn 5. The train continues at the speed of 470. It can never exceed this speed. It thus moves at 470.

3.1.2. Cars without engine power have their speed listed as [towed]. These travel at the speed of the engine. As the scope of the game does not include traction rules there will be a defined maximum of 10 of cars per locomotive or 4 per diesel trolley.

3.2. Breaking/Slowing. A train can break or decrease speed at engine power rate. Namely the first number of the speed factors. **Emergency breaking** can also be done. In this the decrease of speed is 50% greater than that of breaking. But no element on the train that emergency breaks in a turn may fire weapons, communicate nor sight new targets in that turn. **3.3. Coasting.** Trains or loose cars that have lost connection to the train but are not applying breaking power will lose speed on their own at 50 GSU per turn.

Example: A train moving at 300 has lost a car due to coupler loss (Chassis kill) at the end. The train can continue to move at 300 the following turn. The lost car will drift the following turn a speed of 250. (Moving at total distance of 275.) It will slow by 50 each successive turn until it reaches zero speed.

3.4. Derailment. Engine derailment means the speed goes to 0. This often is a result of Mobility kill.

3.4.1. Trains moving at over 250 speed have a chance of rolling over. For speeds of 250-500 there is a 50% chance per car for each car to roll over. For speeds over 500 the chance to rollover is 75% per car.

3.4.2. Moving cars that derail or have mobility killed are still dragged/pushed by the coupled engine. This reduces the maximum speed of the entire train by 100 per derailed/immobile car. Cars in front of the engine and moving over 250 have a 50% chance of derailing the car immediately behind it if the following car is lesser weight than the first. Only 25% if the following car is heavier. Roll only once per car.

3.5. Tracks that are destroyed will derail all cars and engines moving across the section of track that is destroyed. Tracks can be destroyed by mines, bombs,

sabotage or shells. Direct fire at tracks is not very practical as they are a -6 size target. The armor basis is 2. Also the destruction number is [D-1].

3.6. Uncoupling. Train cars may be uncoupled by the crew in one complete turn if the train is stopped and neither car is on fire. If the train is moving or burning it takes two complete turns to uncouple a rail car. It takes two turns to couple two rail cars if they are stopped and adjacent. Only the train's owner may couple or uncouple a train. If the train is under small arms or artillery fire increase the time to perform the previous activities by one turn.

3.7. Unloading - Trains must be stopped to unload troops and vehicles. It takes no time to unload from open topped cars. It takes ¼ turn to unload from enclosed railcars. To unload a train from special ramped flatcars any car in the path of the ramp (end of the flatcar) must be uncoupled and cleared away. It takes three turns and the use of one squad of infantry to employ the ramp. Once the ramp is employed the AFV on the flatcar may drive down the ramp and leave the train at normal speed.

3.8. One peculiar type of draisine was built by the Poles. This incorporated a tank, tankette or other armored vehicle mounted on a flatcar through the use of a mechanism to power the car. While mounted on the car the entire element is treated as a trolley car. When the draisine stopped the armored vehicle could dismount and fight and move as a vehicle.

3.9. Loss of power. An engine that suffers mobility damage can no longer increase nor maintain its speed. It and its train will lose speed at 50 per turn until it comes to rest.

3.10. Ramming. Because trains may not always be able to stop as fast as they want it is possible that a moving train rams other trains, tanks or other vehicles parked or moving on the rails. The tables describing ram damage are at the end of these rules. Roll once for the train damage and once for the AFV damage.

4.0. Sighting. Direct fire weapons on cars like those on armored vehicles must sight targets before they are permitted to fire on them. If there are more than one weapon turret on a car they may sight as a group of elements. Count each independent command cupola and turret as a separate sighting element. Thus if a car has a cupola and two turrets it would count as a group of 3 sighting vehicles, i.e. +2.

4.1. If the cupola is not a command element but only an AA MG location do not count it as part of the sighting group.

4.2. Some cars have separate car cupolas that are not mounted on turrets but on the armored railcar itself. This

cupola does the sighting for the artillery turrets on the railcar.

4.3. If the railcar's turrets have cupolas of their own then count each as part of a group for sighting factor bonuses.

5.0 Combat. Combat for armored trains is very much like normal combat for armored vehicles with two main exceptions.

5.1 A train that moves along straight track and does not change its speed during the turn is considered half moving for firing sequence and to-hit factors.

5.1.1. A train that either slows down or speeds up by more than 50 in a turn is considered to be full moving.

5.1.2. A train that does not change speed and moves a distance of 50 or less is considered to be shift moving.

5.1.3. A train that moves from a stop to 25 or less in a turn is considered to be shift moving. Or which moves from 25 to a stop is considered to be shift moving.

5.1.4. A train that moves along curved track at a speed over 50 is considered to be moving full.

5.2. When a weapon firing at a moving train rolls 'to hit' and the exact number needed to hit is rolled on the D10 then the next car (toward the rear of the train) actually receives the hit instead of the intended target car.

5.2.1. In the case of the last car being the target then this is scored as a miss.

5.3. Firing - Combat using artillery, both direct and indirect is the same as it is with tanks. Forward observers may be detached from the train and used to control battery fire. Often the FO will only have a telephone thus to be over a few turns movement from the train the FO and train must be setup at the beginning of the scenario.

5.4. Limited AA - There is a limit to the number of times a Flak or AA gun may fire AP rounds. The limit is 3 fire segments. If multiple hits occur from a firing it does not count as additional firings. But once the 3 turns are used the weapon may only fire HE or AA rounds.

6.0 Hit Location. When a train is a target there are a few differences than when the target is an armored vehicle. First of all there isn't a single Location-Damage table for all engines. Every engine type or car type will have its own damage table.

6.1. Engines and some cars are so large they may be considered to be two section targets from the side. When the adjusted 'to-hit' factor is under 6 the player may choose either section, 'side 1' or 'side 2' as a target. In which case the D10 location of a hit will be rolled normally on that section. If the fully adjusted to-hit number is 6 or more then side 1 or side 2 may be hit with equal random chance. Roll a D6 to see which portion

(side) of the vehicle is hit. In this case 1-3 means 'side 1' is hit. A 4-6 means 'side 2' is hit.

6.1.1. One very large German panzerdraisine (Panzertriebwagen Nr. 16) consisted of 3 articulated sections.

6.1.2. For the purposes of hit location the actual aspect of the car will be taken in account and not the direction of movement.

6.2. Compared to a tank, train engines and cars are usually much longer than they are wide. Engines and cars with the notation of size being L means the length is exceptionally long. When a train element is marked as 'L' the side of the vehicle does not begin at the 45° angle from the front or rear but at the 30° mark. There is no front nor rear deflection area as the entire deflection angle 30-60° becomes a side deflection for these vehicles.

6.3 Certain new hit locations are now introduced.

6.3.1. Boiler - This is the main engine component of a steam engine. If penetrated this may cause a terrific explosion. If the 'D' roll is +4 over the base number of the shell the boiler explodes. It takes the entire engine with it. Also any car in front of the engine is destroyed as well as any behind the engine, but this is usually just the tender.

6.3.2. Cab - This is the control center for the train engine. In some trains this is also the command element for the entire train.

6.3.3. Chassis - This abstract for the structural component of the vehicle. Penetration is not so important as destruction of its integrity. A Chassis kill will result in a coupler fastening loss for the vehicle. If the vehicle is joined at both ends roll randomly to see which coupler is destroyed.

6.3.4. Compartment - Mostly open area of non-volatile storage or station for personnel.

6.3.5. Cupola - Many artillery railcars had their own cupola that was not on one of the turrets. These were artillery spotters and controllers. In fact this is more akin to the conning tower on a ship. Often they could command artillery from any or all the railcars on the train.

6.3.5.1. In early war trains the railcar cupola only controlled the artillery of the railcar. It had no control of other railcars. But a central command cupola, often positioned in the engine cab or in an armored position in the tender was the overall artillery commander/spotter.

6.3.5.2. Artillery of German Panzerzug BP42/BP44 trains could be controlled by any command car on the train.

6.3.6. Stack - This is mostly a no effect hit. The smoke from the engine is lower than normal. This may obscure

artillery observers on the next two cars behind the engine if it is moving.

6.4. Stun - A stun of a superstructure of a two part vehicle will only stun the weapons and crew of the section of the car or engine hit. A stun has no effect on the mobility of any two part engine and any towed car at any location other than the cab of the engine. If the cab of an stopped engine is stunned then the engine may not move until the cab rolls to unstun. If the cab of a moving engine or single part draisine is stunned then the vehicle must continue to move at it current speed less 25 per turn. This until it rolls to unstun.

6.4.1. Destruction of the vehicle by rolling a Destruction die roll higher than the 'D' factor of the shell will result in the entire railcar being engulfed in flame. Rolling exactly equal to the 'D' number also results in the entire railcar being destroyed unless it is has multiple sections. In that case just that section catches fire and is knocked out of action. Other sections are not affected (yet).

Note - I may introduce an advance rule for the fire to spread to the other section for some reason I am in need of more complications.

Train Damage Assessment	
Location	Damage
Boiler	Mob[D]
Cab	TC[D]
Chassis	Mob[D+4]
Compartment	Pass or Cargo [D+1]
Hull	Mob[D], Fire[D+1]
Stack	Smoke Obscurance [D+1]
SuperS	Fire[D]
Turret	Fire[D], Gun[D], TC[D]
Wheel	Mob[Dx] Add the Wheel Defense number (WDn) to D.
D is the destruction factor of the shell. The D10 roll must equal or exceed D to damage. D+1 - Add one to the destruction factor given by the shell. The D10 roll must equal or exceed this number to damage.	

6.4.2. Likewise if an entire railcar is destroyed is destroyed but does not derail it does not affect other railcars or engines on the train unless it derails.

6.4.3. A railcar will be derailed when it is destroyed if it also suffers a Stun effect. Roll once per destroyed car or compartment to see if it is stunned. If the car derails use rule 3.4.2 to determine if it affects other cars of the train.

6.5. Special cars and damage. There are a number of non-combat cars which may be attached to a train that have special abilities.

6.5.1. Tender - Contain fuel (coal) and water for the

engine. In addition some tenders contained condensers to conserve water. When used on an armored train these cars were also armored and sometimes an anti-aircraft gun was mounted on top. Other than destruction by Chassis damage the only damage to the cargo of the tender is to reduce train maximum speed by half.

6.5.2. Flatcar - Just a Chassis and wheels. Low profile so this car is a more difficult target. Usually these will be placed as the foremost car and last car of an armored train. If a mine destroys or derails the car a slow moving train may have enough time to stop before the engine is also derailed.

6.5.3. Boxcar - A Chassis, wheels and wood cover box. While the boxcar itself is a large target it provides soft cover like as wood building per HE Killpower Adjustment (-1) situation 10.

6.6. Train Damage Markers. While damage in **Panzer War** is usually indicated with pins or markers (we use Risk® counters) it may not be practical to move all damage pins each time the train moves. A train can suffer a great many damage markers before it is destroyed or even stopped. So it would be very useful that a train diagram be kept on paper. All damage could be recorded here. Damage that results in smoke and flame would be the only thing shown on the train model.

6.7. Track Damage. The condition of the track is very critical in running the armored train. If the track is broken or misaligned it will lead to derailling the train.

6.7.1. A track can be broken by area fire from a bomb or HE shell attack. Each 50GSU of track in the Area of Effect is a target per Area fire. If a possible hit results then roll a second time to actually hit the track. A '9' or '10' will hit the track. The track has an intrinsic armor base of 2. If the shell or bomb penetrates the roll the Damage factor per the shell/bomb. A damage success destroys that section of track.

6.7.2. As stated previously it is possible to fire directly at a track in order to damage the track but since it is a small difficult target other means should be used to damage it.

6.7.3. Infantry can take the time to either blow up or dismantle track sections. To break a track it takes 6 turns with an infantry squad on the track to break the track provided they do no other activity during that time.

7.0. Train Morale. Each car or compartment will have its own morale. Treat this just as another AFV for bailout or loss. The loss of the command cupola is treated as a TC loss for both compartments in a two compartment artillery car.

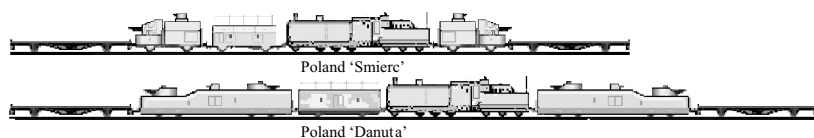
7.1. General Morale Tests. An armored train will take a general morale test just as would a company or platoon. Treat each fighting car or engine as one element of the train command for figuring loss percentages.

7.2. While an armored train cannot immediately change direction should it suffer a morale loss it must attempt to meet the morale loss goals by changing speeds. The exception is if the Command element of the train is destroyed. In which case no speed changes are allowed until a new command element can take over. This is usually accomplished by a regroup order.

Notes on Train Composition.

Many armored trains were wary of attacks from the front and rear as well as mine and air attacks. They would put the more vulnerable engines in the center of the train. That way the guns of the railcars could fire to the front and rear. Also, flatcars would be joined to the front and rear of the train to trigger and buffer the effects of mines.

Extra rails and track repair equipment would be carried there. Anti-aircraft cars were included to ward off air attacks that were most likely directed at the engine. So an armored train is not just an engine and an artillery car or two, it was a large collection of potent weaponry.



Poland - One common train configuration is illustrated by the 'Smierec' and 'Danuta' trains. One engine, one troop car, two cannon cars and two flat cars.



Russia - While Russia had at the start of the war a variety of armored trains with different configurations they also had the BP-35 standard configuration. This used one centrally positioned engine and one AA-car with either 76.2mm or 37mm AA guns. Two 76.2mm double turreted (two-strike) cars and two flat cars for the light version. There was a heavy BP-35 version which substituted PT-35 artillery wagons (107mm) for the PL-35 (76.2mm) cars.

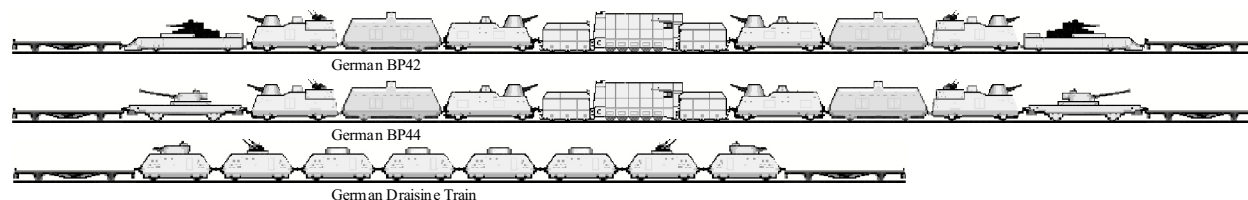
In 1942 the NKPS-42 standard configuration replaced the PL-35 cars with ones mounting T34/76 turrets. The final standard of the war was the BP-43. This replaced the two-turreted cars with two single turreted PL-43 cars.

Germany - Early in the war Germany pieced together different cars and engines in different numbers many of which were captured. The first standard configuration was the BP-42. While this was sufficient for partisan

defense by 1944 Russian armor vehicles were being encountered in greater numbers. The BP-44 configuration added armored train cars mounting medium tank turrets. At about the same time a more flexible system of trains featuring groups of heavy armored trolleys (draisines) was introduced. The number of which varied from six to over a dozen units. The advantage of this type of organization was it was more flexible and didn't depend on a single engine for mobility.

Designer Notes.

There aren't too many reliable detail data sources on the armored trains. I did obtain a few small books but which contained mostly pictures. Some data was also obtained online. Most of the armor factors of trains were obtained by inspecting photographs and extrapolating armor thickness from open armor doors or armor plate photos. If and when more reliable data appears I will update these rules.



Collision Assessment (Train)	
D6	Damage
-1	Lead car derailed.
0	Lead car derailed, second car stunned.
1-2	Lead car destroyed, second car derailed.
3-4	Lead two cars destroyed, next D3 cars derailed and stunned.
5-6	Lead D3 cars destroyed, next D6 cars derailed and stunned.
7-8	Lead D6 cars destroyed, next D6 cars derailed and stunned.
9+	Lead D6 cars destroyed, all other cars derailed and stunned.
	Adjustments
-2	Train speed under 100.
-1	Train speed 100-200.
+1	Train speed 400-500.
+2	Train speed over 500.
-1	No locomotive in train.
+1	6 or more cars in train.
+1	AFV over 40 tons.
-2	AFV under 10 tons.
-1	AFV 10-20 tons.

Collision Assessment (AFV)	
D6	Damage
0 -	Stunned.
1-2	Stunned and one Damage Location Hit: D:6
3-4	Stunned and two Damage Location Hits: D:6
5	AFV Destroyed and pushed along tracks. Tracks broken.
6+	AFV Destroyed and pushed off tracks. Tracks undamaged.
	Adjustments
+2	AFV under 10 tons.
+1	AFV 10-20 tons.
-1	AFV 40-60 tons.
-2	AFV over 60 tons.
-1	Train contains less than 5 cars.
-1	No locomotive in train.
-1	Train speed under 100.
+1	Train speed 300-400.
+2	Train speed 400-500.
+3	Train speed over 500.