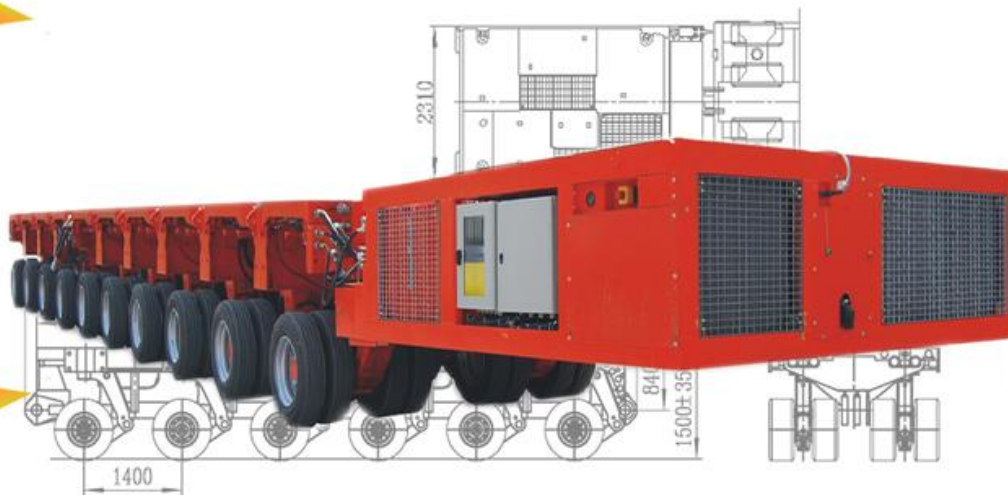
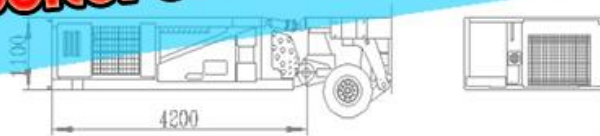


Modular Transporter Ultimate Guide



- ⊕ wheel bogie with drive
- ⊕ wheel bogie

Modular Trailer and SPMT

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Modular transporters are used to transport heavy cargo, which in most case is more than a hundred tons. The special vehicles are also widely used to carry over length goods that other heavy haulers cannot transport.

In this guidebook, you will learn about two major types of modular transporters that include the [self-propelled modular transporter \(SPMT\)](#) and a [hydraulic modular trailer](#).

For each of these models, the guidebook outlines its specification, different structures, and different steering models.

In this book, you will learn how to keep the heavy-duty modular trailers stable when transporting heavy goods. The book outlines the differences between the [two modular transporters](#).

It provides a buying guide to help you select the right supplier in China, which is one of the leading markets of modular transporters.

The guide is divided into two major parts with each part covering one the two modular transporters. Illustrations of different parts are used to enhance your learning of the transporters.



SPMT



modular trailer

PART 1: SELF-PROPELLED MODULAR TRANSPORTER (SPMT)

Chapter One: What Is SPMT?

A self-propelled modular transporter is a special vehicle that has three major functions including hydraulic driving, hydraulic steering, and hydraulic lifting. A hydraulic system is used to drive each of these functions. The transporter is used for the transportation of heavy loads such as sections of a ship, the whole ship or a prefabricated section. The

special vehicles transport such cargo from a shipyard to offshore sites. Other heavy haulers cannot transport such cargo because of its weight and length.

An SPMT can drive the cradle that bears heavy loads, use its hydraulic lifting system to lift up heavy loads, and then transport the loads to the right destination. The transporter does not need any hoisting equipment or a crane for the functions. Most of other heavy haulers require additional hoisting equipment to load cargo on their platform. One person can control all the functions until the load reaches its designated place.

1.1 Applications of SPMT

SPMTs are used in different industries because they can transport all types of goods. The major industries where these transporters are used are outlined below:

Shipbuilding industry: Ships are assembled in shipyards before they are transported to the shore. In most cases, the shipyards are located miles away from the sea shores.

SPMTs are used to transport sections of a ship or the whole from the shipyard to their designated place. Ships are part of the heaviest loads that are transported on the road.

The modular transporters have enough capacity and space to accommodate such heavy and bulky cargo.



spmt for shipbuilding

Oceanographic engineering: Oceanographic instruments, equipment, and devices are also assembled off-site and then transported to the sea using SPMTs. The ocean environment does not support the manufacturer and repair of equipment.

The functions must be done in an assembly unit on land before the equipment can be moved to the right destination. The modular transporters provide a convenient way for the manufacturers to move the equipment to the seashore.

Heavy-cargo logistics: Some companies specialize in transporting heavy cargo from one destination to another. Such companies serve clients who need to transport heavy loads a few times in a year.

For instance, a new manufacturer may need to transport the production equipment to the warehouse. Logistics companies require SPMTs to transport such types of loads.

The heavy cargo in this case ranges from machinery and equipment to stacks of finished products or raw materials. The modular transporters can be customized to transport any cargo as long as it is well packaged.



splt for heavy cargo

Heavy equipment manufacturing: Heavy equipment manufacturers require transport solutions to transport components to their assembly units. Some of the parts include long and wide metallic beams depending on the final products.

The manufacturers also require transport solutions to transport the fully-assembled equipment to the clients or warehouse. Self-propelled modular trailers are the best transport solutions for heavy equipment.

The modular transporters provide a reliable solution for all companies that use heavy and bulky equipment in their production processes.

Electric power construction: The companies involved in constructing power plants use heavy machinery and equipment to set the plants. Large power plants use the heaviest parts because of the capacity required.

The companies rely on modular transporters to move their construction equipment and heavy component to the power plants. Power plants are mostly made of large and heavy steel beams.

Chemical industry construction: The chemical industry also requires special transportation vehicle to move heavy raw materials, equipment, and finished products.

Setting up the manufacturing sites requires the companies to transport heavy and long tubes, cylindrical tanks, and metallic beams among other parts.

In most cases, the parts are purchases from other assembly companies and transported to the chemical production sites.



chemical tank transport

Project construction: SPMTs are commonly used to transport construction blocks include concrete blocks to construction sites. Concrete bridge and road sections are safely transported using these heavy transporters.

The modular transporters are also used to ferry construction materials in bulk such as cement, ballast, and sand among others.



Project construction

Heavy equipment transport: Every company that uses heavy equipment in its production process requires a special vehicle to move the equipment from the manufacturer to its warehouse.

Some companies deal in buying and selling heavy equipment. SPMTs offer great solutions to such companies.

We have outlined the most common applications of self-propelled modular trailers. However, their applications are not limited to these industries.

The heavy-duty hauler can move any heavy load from one place to another as long as the cargo is properly packaged. Let us now look at the specifications and structure that enables the transporters to carry the heaviest industrial loads.

Read more:

[Best SPMT Manufacturers You Should Know](#)

[Introduction to SPMT Bridge Moves](#)

Chapter Two: The Specifications of SPMTs

SPMTs have two major specifications, which determine their performance and cost. The first specification is the SPMT with a width of 2.43m while the second has a width of 3m.

The first type with the width of 2.43m is the most commonly used SPMT in the world. One of the reasons why this type is preferred is that it is easy to load it into the container.

In addition, it is easier to transport by sea than it is for the second type. The main shortcoming is that it is more expensive than the second specification.



2.43m spmt

The 3m type is cheaper than the 2.43m type but it is less popular in the market. The type has a higher cost performance than the first type. The height of SPMT ranges from 1150mm to 1850mm.

The two specifications have different loading capacities. The 3m type has a maximum load capacity of 36 tons per axle. The 2.43m model, on the other hand, has a maximum capacity of 40 to 48 tons per axle.

The loading capacity of the 2.43m is higher and hence the trailers are more expensive

3m Models

Driving speed (km/h)	5	3	1	0.5
Max. total weight (t)	204	212	216	230
Dead weight (t)	24	24	24	24
Rated payload (t)	180	185	192	202
Total weight of per axle line (t)	34	35	36	40
Overall dimensions of platform, L (mm) × W (mm)	9000×3000			
Min. height of platform (mm)	Approx.980			
Driving height of platform when unloaded (mm)	Approx.1580			
The lifting compensation of the platform (mm)	600 (± 300)			
Qty. of wheel bogies(total)	12			
Qty. of wheel bogies (wheel bogie with drive)	4			
Qty. of wheel bogies (wheel bogie with brake)	6			
Qty. of wheel bogies (wheel bogie without brake)	2			
Traction force (kN)	240			
Brake force (kN)	240			
Type of tire	215/75R17.5 (Solid tire)			
Steering angle (°)	± 106°			
Permissible bending moment (kNm)	Approx. -6200 ~+7700			

3 m model spmt specifications

2.43m Models

Driving speed (km/h)	5	3	1	0.5
Max. total weight (t)	216	240	258	288
Dead weight (t)	27	27	27	27
Rated payload (t)	189	213	231	261
Total weight of per axle line (t)	36	40	43	48
Overall dimensions of platform, L (mm) × W (mm)	8400×2430			
Min. height of platform (mm)	Approx.1150			
Driving height of platform when unloaded (mm)	Approx.1500			
The lifting compensation of the platform (mm)	700 (± 350)			
Qty. of wheel bogies(total)	12			
Qty. of wheel bogies (wheel bogie with drive)	4			
Qty. of wheel bogies (wheel bogie with brake)	6			
Qty. of wheel bogies (wheel bogie without brake)	2			
Traction force (kN)	240			
Brake force (kN)	240			
Type of tire	355/65-15/9.75 (Solid tire)			
Steering angle	± 106°			
Permissible bending moment (kNm)	Approx. -6200 ~+7700			

2.43 m model spmt specifications

Contact us, get more specs now!!

info@anstertrailer.com

Chapter Three: Illumination of the Main Equipment

In this chapter, we will look at the main components of a self-propelled modular transporter. The main components include the power pack unit, frame, hydraulic system, and the hydraulic suspension. The transporter also comes with additional accessories that enable users to modify its structure. The type of additional accessories depends on the model of the transporter. We will also discuss how to keep the transporter horizontal when carrying heavy loads in the chapter.

3.1 Power Pack Unit

The power pack unit (PPU) in a self-propelled modular transporter consists of a diesel engine, radiator, variable pump, transfer case, and an air filter.

Other components of the PPU include an intercooler, hydraulic oil tank, hydraulic oil cooler, micro-control system, storage battery, and a fuel tank among other components.

The PPU has a lifting cylinder, which is used to lift the power pack unit to the same height as that of the platform. The PPU can also be lifted with the same mechanism to 12° to adapt to a slope.



smt ppu

3.2 Frame

The frame is the main component of the transporter that bears the weight of the load. The security coefficient of the design is 1.5 because the frame bears the most dangerous condition of the load.

The main bearing parts in a trailer including the wheel bogie and the main girder of the frame have a firm box-type beam structure.

The materials used to make the bearing parts are high-performance welding plates with a yielding strength of 690MPa.

The whole frame of the modular unit has high strength and a great ability to resist any force that may cause it to bend. The properties of frame prevent the problem of concentrated loading.

The frame has a longitudinal beam in the middle, which has a trapezoidal box structure. It also consists of oscillating cylinders cases that are welded into the frame as one unit.



sfmt frame

The middle section of the frame has three pin holes in the chips shape located towards the end of the frame.

The purpose of the pin holes is to enable end-to-end coupling, which is common with self-propelled modular trailers. Both sides of the frame have bolt holes that enable side-to-side coupling.

The frame also has four hook points that are located near the four corners. The function of hook points is to bear the dead weight of the modular transporter for hoisting.

3.3 Hydraulic System

The hydraulic system consists of five major parts with different specifications and functions.

The parts include the hydraulic brake system, hydraulic cooling system, hydraulic lifting system, hydrostatic drive system, and hydraulic steering system. Each of these systems is discussed below.

- **The hydrostatic drive system**

The system refers to a closed-loop hydraulic system with a variable drive pump. The control type of the variable pump is an electric proportional control (EP).

The drive systems uses pressurise liquid to power the modular trailer. The term hydrostatic, in this case, refers to the transfer of energy or power from flow and pressure. The term does not include the kinetic energy of the liquid flow.

- **The hydraulic steering system**

This system is an open-loop system with an open-loop variable pump. The pump has two major functions that include loading sensing and controlling pressure-cutting-off flow.

It can adjust the output flow of the variable pump based the needs of the load. Adjusting the flow also saves energy. The pressure-cutting-off flow control function enables the operator to restrict the variable pump's maximum output pressure.

The main reason for restricting the pressure is to protect the hydraulic system from potential damages.



sfmt steering

- **The hydraulic lifting system**

The hydraulic lifting and steering system share the same open-loop variable pump. The hydraulic oil from the variable pump is shared equally between the lifting and steering cylinder.

Consequently, the platform of the modular transporter lifts evenly and remains horizontal when lifting.



smt control

- **The hydraulic cooling system**

The cooling system consists of two gear motors that drive fans that cool the composite radiator. One gear pump is used to supply the hydraulic oil under great pressure to the two gear motors.

- **The hydraulic brake system**

The brake system in a modular transporter and its parking brake work when the hydraulic brake cylinder is pushed and the brake drum released.

The brake cylinder has springs that keep the transporter in the parking brake state when the cylinder has no pressure oil. The braking system has a manual pump, which is used to release the parking brake when there is no power in the vehicle.

- **The hydraulic suspension**

The hydraulic suspensions are divided into different wheel bogies. The bogies include wheel bogies with brake, wheel bogies with drive, and wheel bogies without brake.

The hydraulic suspensions consist of a hydraulic suspension cylinder, bogie frame, axle with drive, axle with brake or without brake, rocker arm, and tire.

The gear shaft sleeves are usually welded onto the bogie frame and a hydraulic suspension cylinder placed between the rocker arm and bogie frame.

The purpose of this cylinder is to connect the two parts and bear the load, which gives the hydraulic suspension system an adjusting range of ± 350 mm.

The motor and reducer are installed on the wheel bogies with drive to provide the driving force for the modular transporter. The wheel bogies with brake are usually installed together with the axle with brake that has a brake cylinder on it.

The cylinder has the parking and service brake for the vehicle.

The three different types of wheel bogies used in the transporter have a mechanical stopper that limits the maximum position. The stopper uses the minimum stroke of the hydraulic suspension cylinder in order to control the lowest position.



drive axle



brake axle



support axle

A pin is used to lock the lowest position of the hydraulic suspension cylinder. The locking pin is also used for transporting vehicles, repairing the axles and replacing tires.

When replacing tires of a fully loaded or unloaded modular transporter, the transporter is brought down to its lowest level. The locking pin is then placed into the wheel bogie for the tire that needs to be replaced.

The next step is to shut off the ball valve in the suspension cylinder and lift the transporter up for the tire to be replaced.

After replacing the tire, the transporter is lowered down again to its lowest position. The locking pin is removed and the ball valve is opened. The transporter is then lifted up back to its driving height.

The hydraulic suspension system helps in keeping the self-propelled modular transporter horizontal when transporting heavy loads.



keep horizontal

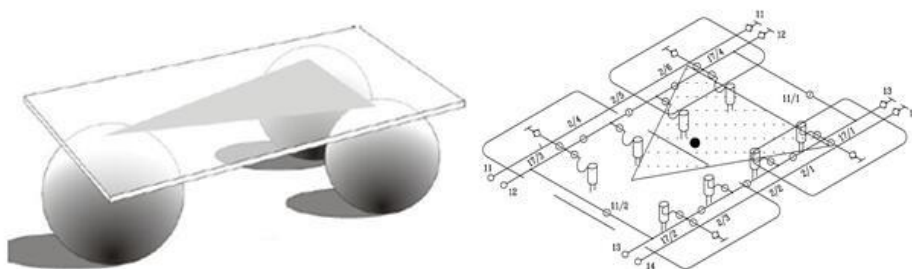
The suspension system can be adjusted to different positions such that the support system of the transporter has three or four points of support. The different points of support bring an equal distribution of the load on the tires.

In addition, the supporting points make the transportation of heavy loads on uneven or rough roads safe and reliable.

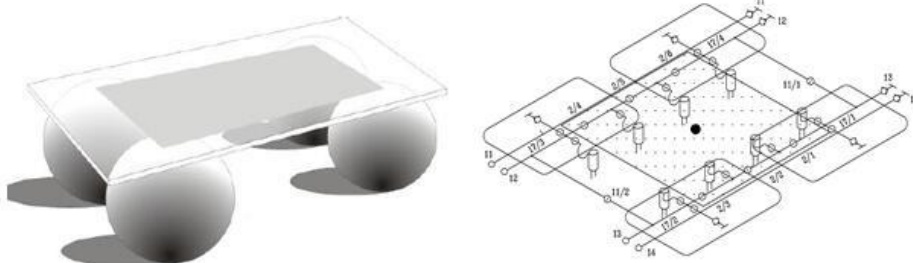
suspension cylinders in the transporters are installed with two directions anti-break valve.

When the pipeline is broken, the increasing flow creates a differential pressure between the inlet port and outlet port of the valve to block the broken pipeline. This prevents the cargo or load from inclining on one side.

Consequently, the modular transporter remains stable while transporting heavy loads.



Three points supporting



Four points supporting

sfmt support

Each wheel bogie with drive on the modular trailer has a speed sensor. The micro-electric system monitors the driving wheels' sleep slip ratio constantly when the self-propelled transporter is moving.

If the sleep slip ratio of any of the wheels goes above the setting value, the micro-electric system sends a signal immediately.

The signal causes changes in the displacement of the driving motor, which ensure that other wheels with drive have the normal tractive force.

The modular transporter achieves anti-skid control and protects its motor through the function of the micro-electric system.

Skidding is dangerous for the heavy haulers because it may lead to loss of lives, cargo, and damages to the trailer, especially if the vehicle overturns.

3.4 Remote Controller

A self-propelled modular transporter has a radio remote controller that integrates all the buttons and switches that control the operations of the transporter.

The radio remote controller has two major components that include the receiver and the emitter. The controller can transmit data through a cable.

In case there interruptions in transmitting remote signals in the working environment, the controllers immediately starts using the cable to transmit data. The cable controller functions in the same way as the radio remote controller.

The radio remote controller can achieve the set of the master or slave coupling of the modular transporter. The controller of the master transporter can achieve all the functions of the modular combination.



remote control

A single modular transporter has the same functions that include acceleration, braking, monitoring information, driving forward and backward, and normal driving.

Other functions of a modular combination include the setting of steering modes, pressing the parking brake, stopping the engine, steering to the left or right, and stopping for emergencies.

The remote controller comes with straps that improve fastening. The remote controller enables one operator to load a modular transporter without any hoisting or lifting equipment.

3.5 Electronic Control System

The electronic control system has an extended module and an electronic calculating unit. A modular transporter uses a rated voltage of 24V to equip two pieces of 180AH or 165AH depending on the model.

The electronic control and monitoring equipment that are installed on the PPU have an LCD color monitor. The main functions of the meter display include monitoring and general operation functions.

Other functions include meter display of the oil pressure of the engine, air pressure of the brake, and the hydraulic steering pressure.

The meter display also shows the driving speed, fuel level of the engine, working hour of the engine, water temperature of the engine, and the hydrostatic driving pressure.



main display

The lighting alarm shows the blockage of engine filters, the abnormal temperature of the engine cooling material, abnormal pressure of the engine lubrication oil and the blockage of hydraulic filters.

The lighting alarm also displays the low level of hydraulic oil, the low level of fuel, and the low level of hydraulic oil.

The control components in the control boxes and wire markings or terminals are reliable and firms.

The main electronic components including the LCD display, pressure sensor, angular sensor, and the electronic calculating unit have a high protection class.

The lighting components include the tail lamp device and the emergency lamp warning device.

3.6 Combination coupling for SPMTs

There are two major methods of coupling modular transporters, which include side-by-side and end-by-end coupling. The method of coupling that a transporter chooses depends on the dimensions of the cargo.

Side by side coupling is necessary for wide cargo while end by end coupling is used for over length cargo. The modular transporters can either use mechanical coupling or loose coupling.

A hydraulic pin and a special connecting pin are used for coupling transporters end-by-end. The side-by-side coupling uses specific devices or communication cables that are designed to ensure safe coupling.

Each modular transporter has a control system that helps it to achieve a coordinated and synchronized steering function as well as other functions.

When different modular transporters are coupled, they communicate through the CAN bus, which makes the coupling combination to work in a coordinated and synchronized manner.



sfmt connection part

When several modular transporters are communicating or transmitting data across each other, each transporter is referred to as a master unit.

The other modular transporters get driving, steering, lifting and braking instructions from the master electronic calculating unit.

The combination between the coupled transporters and the combination between the modular transporter and the PPU use a hydraulic pipe, mechanical device, and a cable.



sfmt connection pipeline

The combination of the hydraulic lines and cables use hydraulic fast couplings and reliable electric connectors. The devices have an error-proof design that ensures a safe and reliable coupling.

Safe coupling is important to ensure that heavy cargo reaches its destination in a good condition.

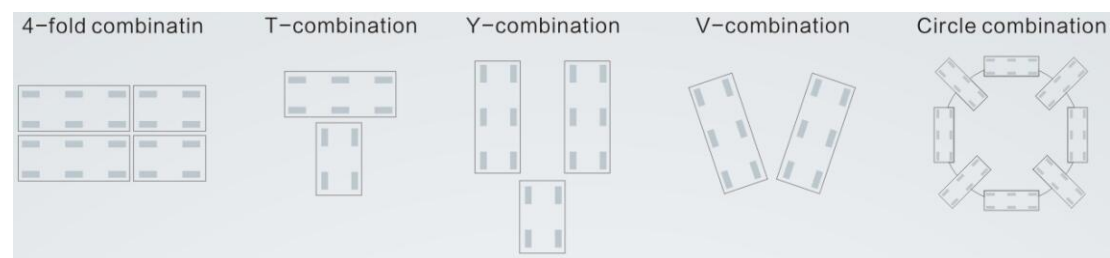
3.7 Compound Mode

Self propelled modular trailers use different combinations to transport over size equipment or any other cargo.

The ability to use different combinations include the 4-fold combination, T combination, Y combination and circle combination make the SPMT economical and efficient.

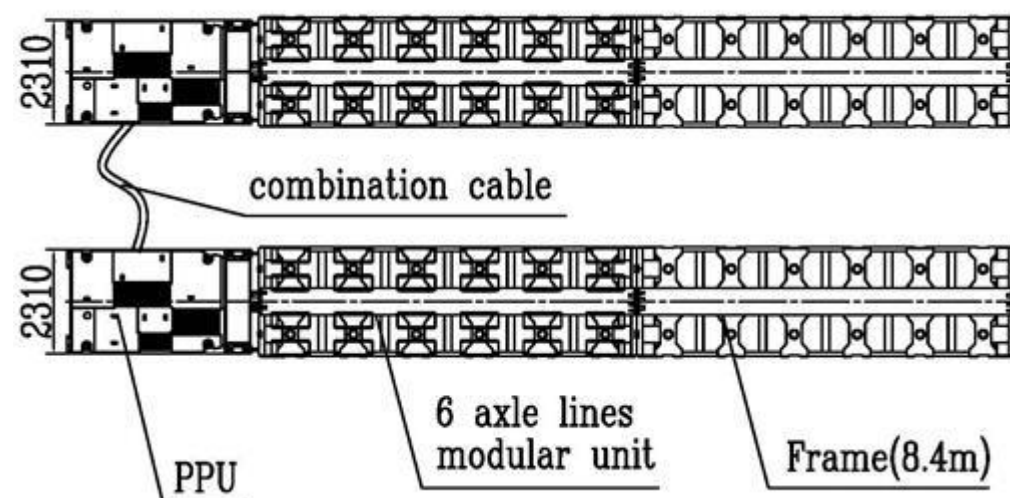
You do not need to order for a customized special transporter for a project. The same SPMT can handle different projects and transport all types of heavy cargo.

You just need to change the combinations to suit the dimensions of the cargo.



spmt combinations

If the SPMT's length is not enough to accommodate the full load, the frame is used to increase the transporter's length.



Chapter Four: Different steering structures in SPMTs

Self-propelled modular trailers have two major types of steering systems. The two systems are the electronic compound multi-mode steering system and a mechanical steering system. Let us look at the functionality of each system.

4.1 Electronic compound multi-code steering system

The steering system consists of several parts including the steering hydraulic pump, oscillating cylinder, angular sensor, and a proportional sandwich valve.

Other parts in the system include rack-and-pinion steering device and an electronic calculating unit. The rack-and-pinion steering device consists of the oscillating cylinder cases, pinion, rack, oscillating cylinder, and angular sensor.

The function of the cases of the oscillating cylinder is acting as a cross girder.

The cases are welded together with the frame into one unit that has a reliable structure and great manufacturability. The angular sensors are usually installed on the wheel bogies.

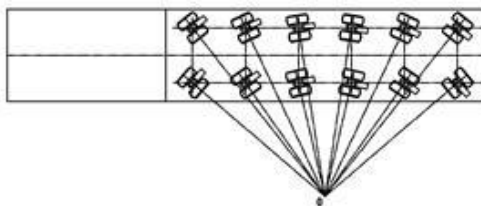
Each bogie has its angular sensor. When a steering signal is released from the remote controller, the electronic calculating unit calculates its theoretical angle based on the steering mode.

The electronic unit will then compare the feedback from all angular sensors on all wheel bogies.

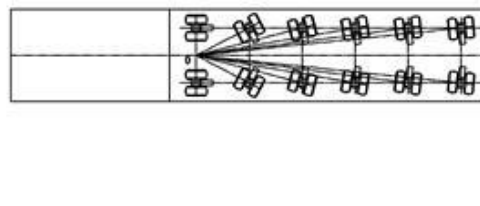
The comparison of feedback gives the electric current of the proportional sandwich valves that control opening. The hydraulic steering cylinder will then push the wheel bogies such that they steer to the right positions.

A self-propelled modular transporter can assume 8 different steering modes. The steering modes include:

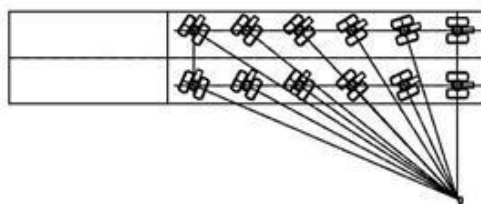
- All wheel steering along mode
- Diagonal steering cross mode
- Reset mode
- All wheel steering cross mode
- Rear wheel steering mode
- Circle steering mode
- Diagonal steering cross mode
- Front wheel steering mode



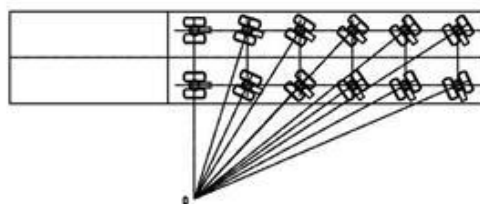
All wheel steering along mode



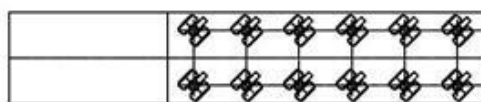
All wheel steering cross mode



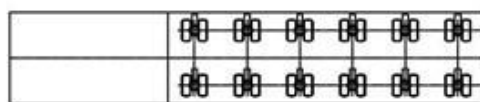
Front wheel steering mode



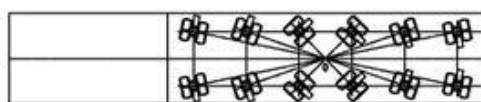
Rear wheel steering mode



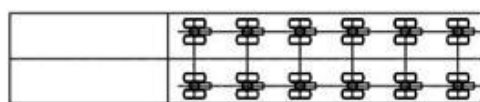
Diagonal steering along mode



Diagonal steering cross mode

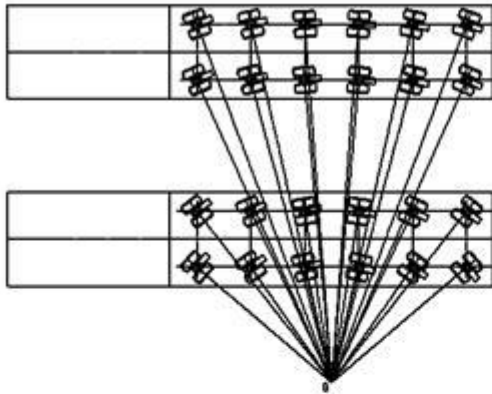


Circle steering mode

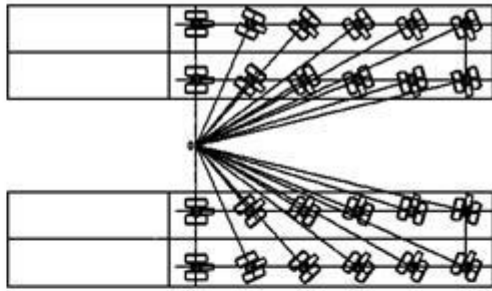


Reset mode

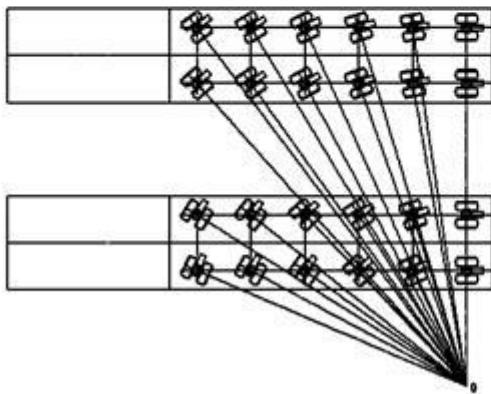
single transporter steering



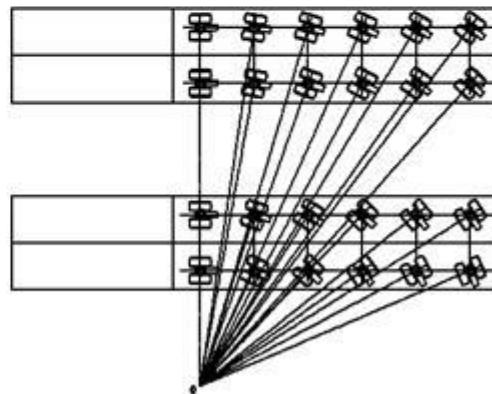
All wheel steering along mode



All wheel steering cross mode

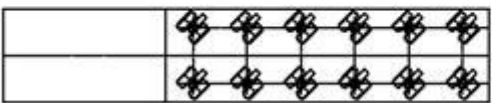
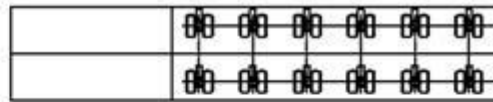
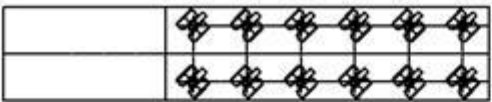


Front wheel steering mode

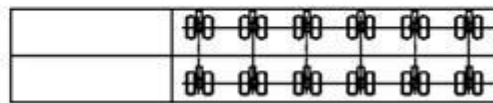


Rear wheel steering mode

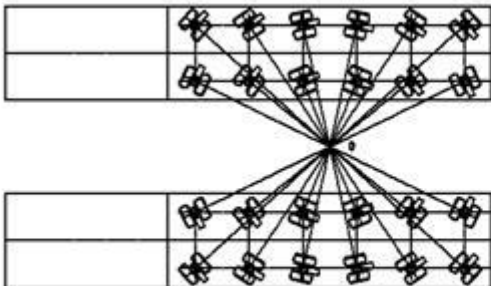
double transporters steering 1



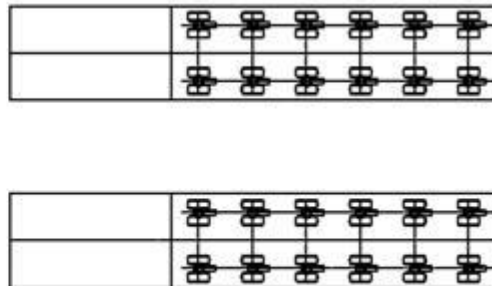
Diagonal steering along mode



Diagonal steering cross mode



Circle steering mode



Reset mode

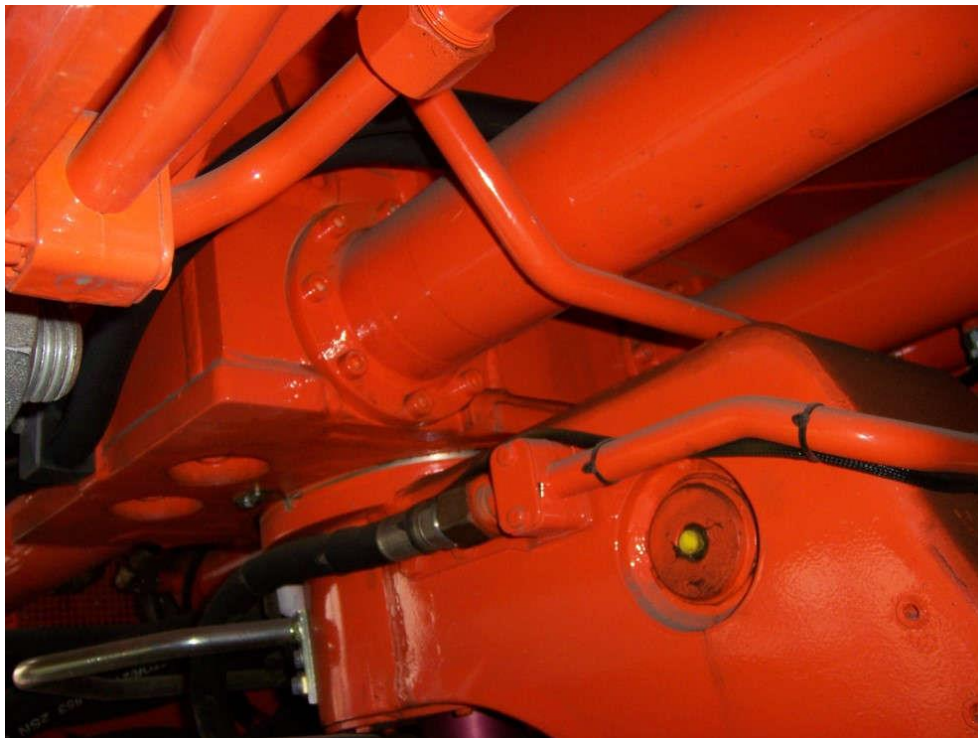
double transporters steering 2

The multi-coupling transporters have the same steering modes as the single transporters. Whenever the difference in the steering angle of the wheel bogie is above 8° , the driving system of the transporter shuts automatically.

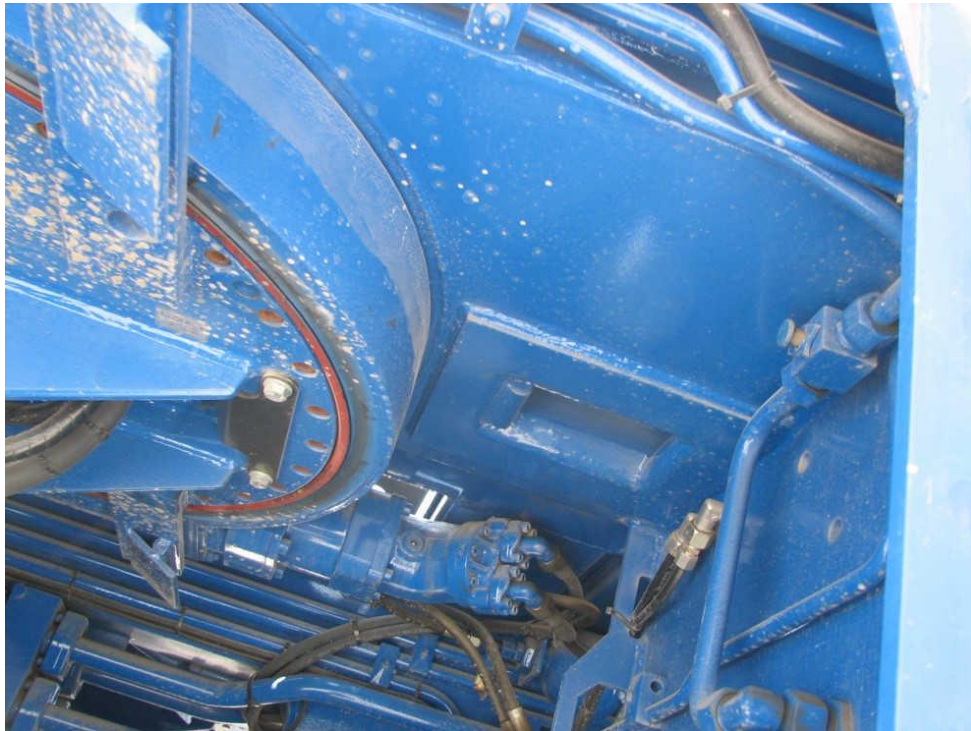
Consequently, the vehicle stops or gives an alarm.

A SPMT can also assume other steering modes depending on the requirements of the operation. The electronic compound multi-mode steering system can achieve $\pm 110^\circ$ angle steering.

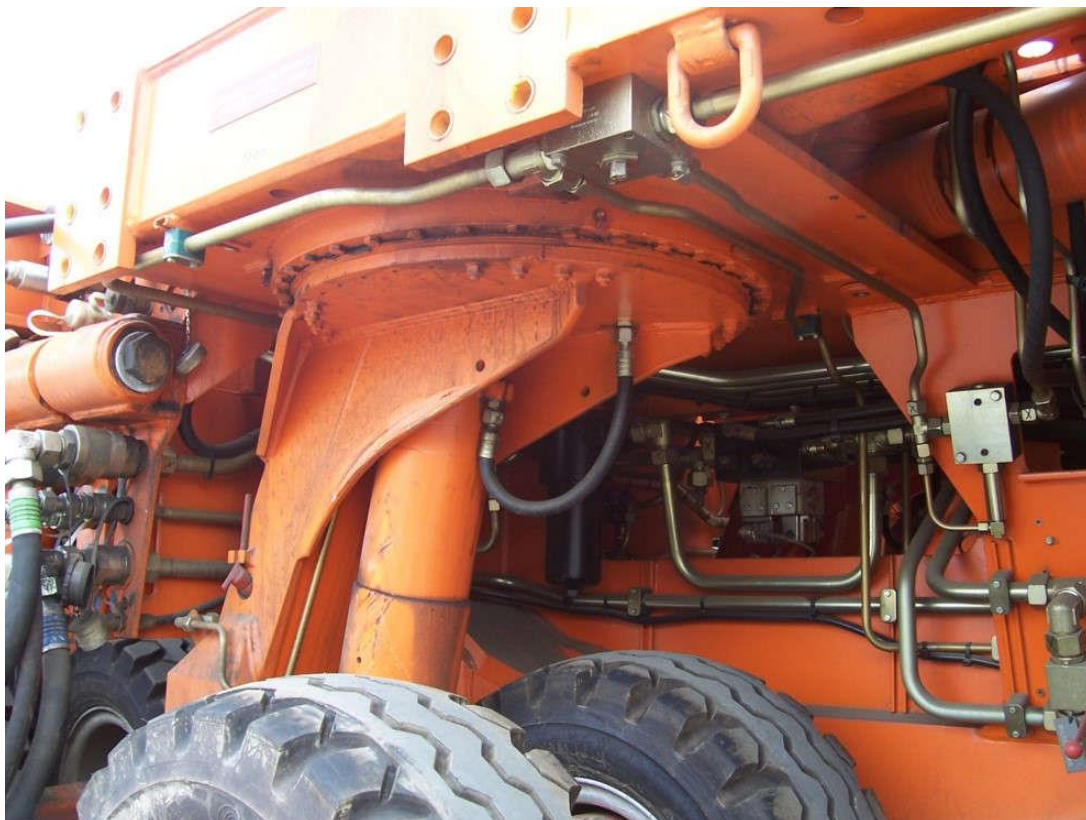
Here are three types of steering transmission used in electronic compound multi-code steering system:



pinion and rack



worm and gear



cylinder transmission

4.2 Mechanical steering system

The mechanical steering system is limited in that it can only achieve $\pm 55^\circ$ steering angle. The SPMTs and modular transporters use the same mechanical steering system.

Hence, the mechanical steering system will be discussed in details in part two, chapter eight. A few things to note about the mechanical steering system are that it has four major components.

The components include a steering orifice plate, a steering central panel, steering cylinders, and steering rods.

The steering orifice plate is welded with the bogie frame. It has specific quantities of assembling holes that are used for installing steering rods.

Read More:

[Self-propelled modular transporter](#)

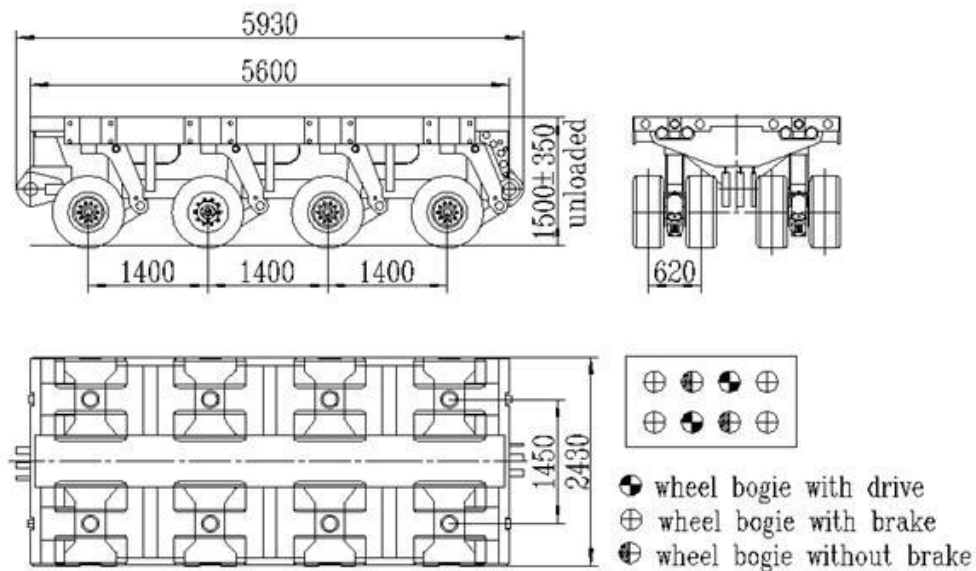
Chapter Five: Drawings of the SPMT

Self-propelled modular transporters have different structures, which in most cases vary depending on the number of axle lines. It is easier to understand the structures when looking at diagrams with different components. In this chapter, we will provide several diagrams of different structures of SPMT. Remember that SPMTs are either 2.43m or 3m in width. You will view diagrams of both 4-axle and 6-axle structure of both types of SPMTs.

5.1 Structures of SPMT

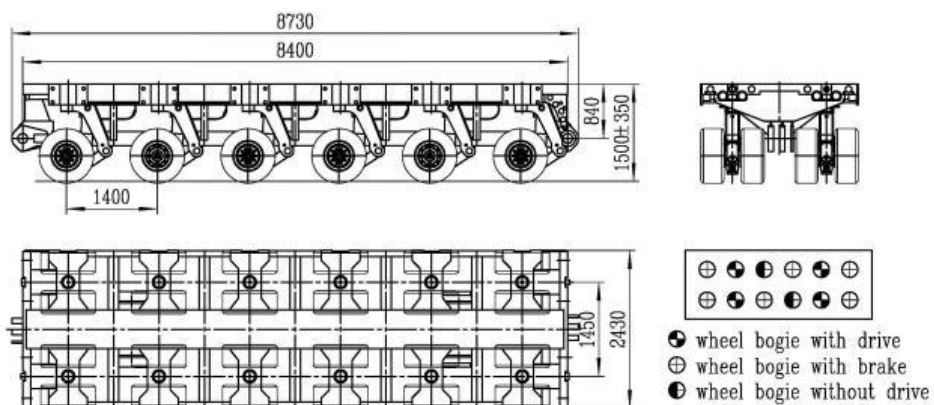
The diagrams of different structures of SPMT have dimensions indicated on some components. The diagrams also have a key to help you determine where the drive pendulum axle and brake pendulum axle are located on the each structure.

Structure diagram of 2.43 m SPMT model with 4 axles



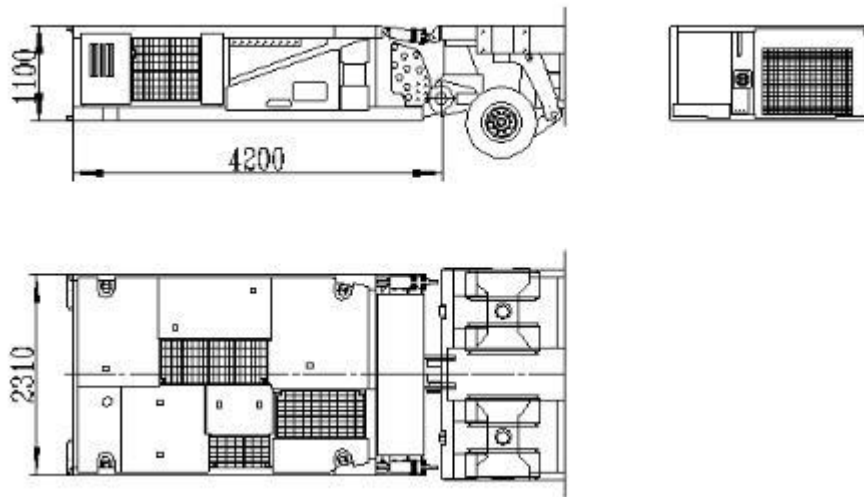
4 axles spmt

Structure diagram of 2.43 m SPMT model with 6 axles



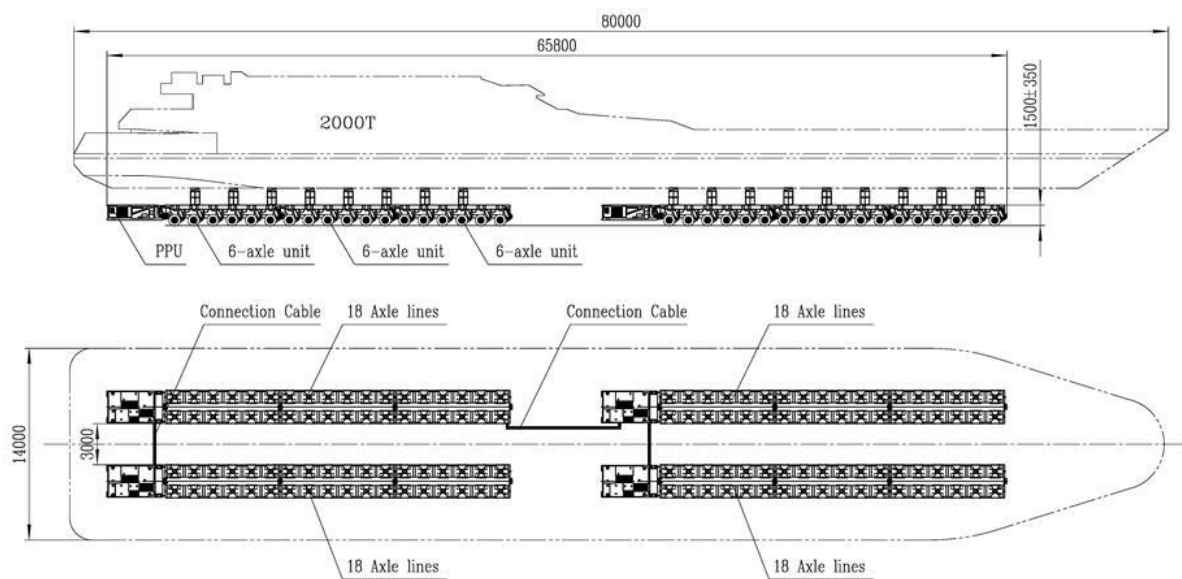
6 axles spmt

Structure diagram of PPU



spmt ppu

Structure diagram of SPMT Project



project drawing

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PART 2: MODULAR TRAILER

In this second part, we will discuss the modular trailer, which is one of the major types of modular transporters as indicated at the beginning of this guidebook. This second part outlines the major uses and specifications of the hydraulic modular trailer. The chapters in this part also outline the main components of the hydraulic modular trailer and different combination forms of the transporter. You will also learn the end of the section the forecast of modular transporters in China and the process of selecting a reliable supplier. Let us start with the definition and description of the modular trailer.

Chapter Six: What Is A Hydraulic Modular Trailer?

A modular trailer is a series of special vehicles that is used to transport large cargos that are difficult to disassemble. The trailer is also used transport over-length goods.

The major applications of modular trailers include power stations, chemical industry, iron and steel industry and the construction industry. Modular trailers are used for mining operations because of their excellent lateral stability.

A self-propelled modular transporter without the power pack unit is similar to the hydraulic modular trailer. The main between the modular trailer and the SPMT without the PPU is that they have a different steering system.

The modular trailer uses a mechanical steering system. Another difference is that the modular trailer can be combined using a gooseneck and a drawbar.

The vehicle loading platform of a modular trailer is kept at balance when transporting goods on bumpy or rough roads in a way that the damping property is excellent.

The brace kit of the vehicle can achieve three or four brace points to ensure that the load of each point is uniform. The four points also ensure that there is no partial set.

The steering system of the modular trailer has a hydraulic planar pitman driver. The vehicle can achieve minimum turning diameter and normal drive by adjusting the hydraulic steering system and using different reasonable pitman layouts.

The supporting assemblies for the trailer part have a solid box beam structure.

High performance welding steel is used to make the main frame longitudinal girder, bogie frame, steering arm, and the platform.



hydraulic modular trailer

Series modular trailers have two major modes that include full-trailer towing and the semi-trailer towing. The full trailer towing mode can achieve a maximum speed of 40 km/h. This model can achieve the maximum tractive force.

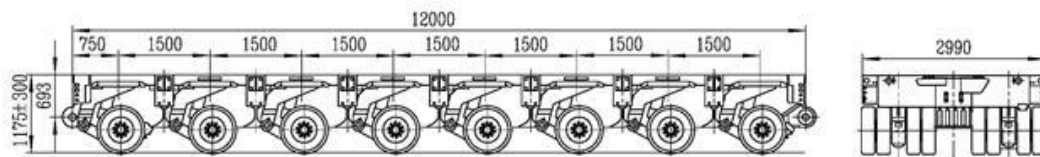
Hence, the full trailer mode is used for heavy duty transportation but at a low speed.

The semi-trailer towing mode can reduce the full length of the vehicle and minimize turning diameter. The semi-trailer mode can also increase the effective load and the speed of the modular trailer.

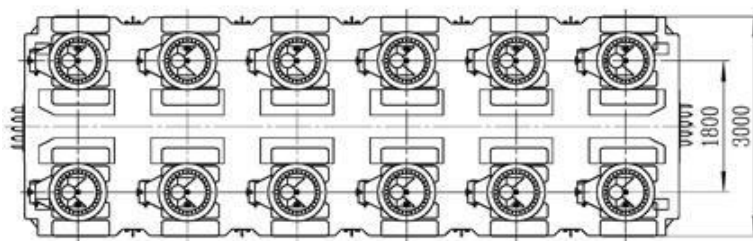
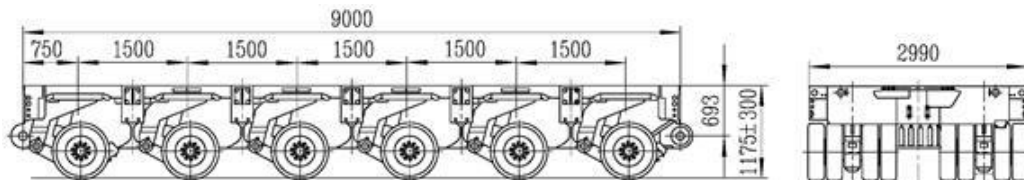
Hence, the maximum of the semi-trailer towing model is 80 km/h, which is twice the maximum speed of the full-trailer towing mode.

Chapter Seven: The Specifications of a Modular Trailer

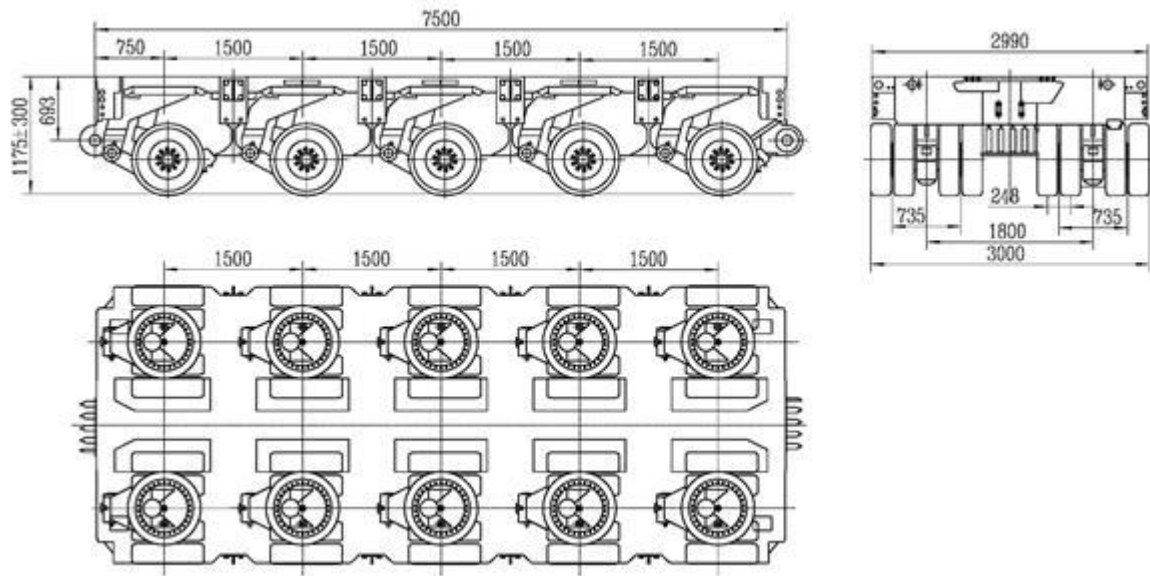
The modular trailers come in different modular units that include 2, 3, 4, 5, 6, and 8 axle models. The maximum load per axle is up to 40 tons. A larger number of axle lines means that the modular trailer has a higher loading capacity.



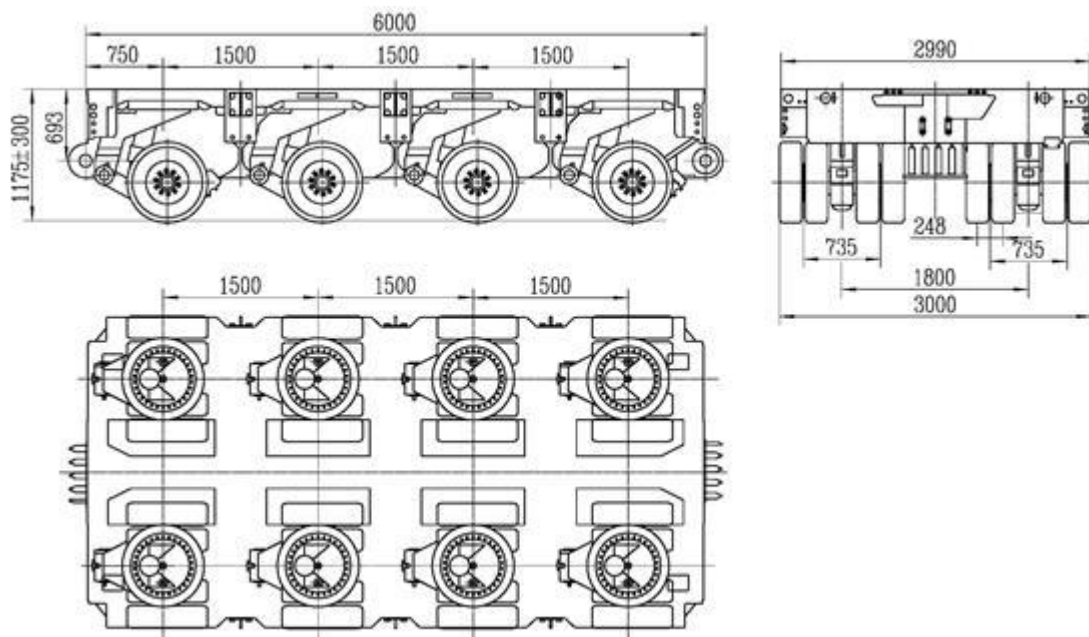
8 axles modular trailer



6 axles modular trailer



5 axles modular trailer



4 axles modular trailer

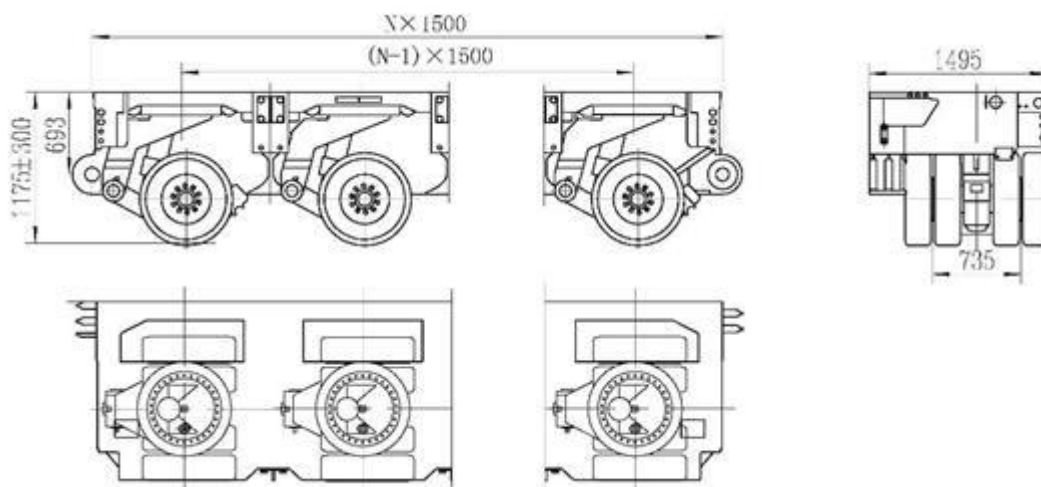
Axle line	6						
Speed (km/h)	0.5	1	5	20	40	60	80
Total weight (kg)	240,000	216,000	204,000	156,600	120,000	108,000	98,400
Dead-weight (kg)	24,000 (approx.)						
Rated payload (kg)	216,000	192,000	180,000	132,000	96,000	84,000	74,400
Load / axle line (kg)	40,000	36,000	34,000	26,100	20,000	18,000	16,400
Overall Length (mm)	9000						
Total width (mm)	3000						
Height (mm)	1175±300 (full-load)						
Wheelbase (mm)	1500						
Track (mm)	1800						
Tyre size	215/75R17.5 PR16 135/133J						
Rim size	6.00-17.5						
Number of tyre	48						
Steering angle (°)	±55						
Drive axle-line	2						

6 axles modular trailer specification

- Half Modular Unit**

The framework of all the axles line of a half modular is combined by the left and right half modular unit. The technical parameter of the half modular unit is the same as that of the modular unit after they have been combined.

The left and right half modular units cannot be used independently. The units can only used when combined or when they are combined with the modular unit.



half modular unit

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Chapter Eight: Illumination of Main Equipment

This chapter outlines the main components of a modular trailer. The chapter outlines the specifications including the structure and the functions of each component or equipment. At the end of the chapter, you will learn about the additional accessories that come with modular trailers.

8.1 Frame

The main girder of frame has a box-type carrying beam structure. The girder uses high-performance welding steel to ensure stability and reliability. The surface of the frame requires treatment.

The surface of the main structure should be treated with sand blasting. The thickness of the painting used on the surface should meet the national standards.

The brand of the painting used should be among the top brands in the world. All the small-sized parts of the frame should be zinc-plated.



modular trailer frame

The box-shaped center beam and the stable crossbeams give the frame a high degree of rigidity. Hence, the frame can achieve its optimal loading level.

The steering system, air tank, and hydraulic oil tank are all integrated into the bogie frame. Thus, the parts are protected against damage and corrosion.

The frame has a reinforced loading deck, which allows extreme point loads. The optimized bolt-plate coupling, on the other hand, eliminates any problems that may arise when assembling the longitudinal combinations.

8.2 Hydraulic wheel bogie

The modular unit uses a hydraulic wheel bogie, which consists of the bogie frame, hydraulic cylinder, axle, tyre, and rocker arm. It has a strong load capacity.

When the road is uneven on the transverse direction, the axle swings to compensate. If the road is uneven in the driving direction, the hydraulic lifting system adjusts the modular supporting system.

The modular unit can assume 3-point or 4-point supporting system to ensure that each supporting point carries an even load.

8.3 The Mechanism of Steering

The steering mechanism consists of the steering central panel, steering orifice plate, steering cylinders, and steering rods. The steering orifice plate is welded together with the bogie frame.

The plate has specific quantities of assembling holes that are used to install steering rods. The positions where steering rods are installed on the steering orifice plate can be changed to suit different combination modes of the modular unit.

The unit can meet the minimum steering radius and the maximum turning angle of 55 degrees.

The modular unit uses three major steering modes that include the all wheel steering along (over five axle lines), diagonal steering along, and the front-wheel steering mode.

The steering rods can be adjusted quickly and easily to suit the desired steering angle.



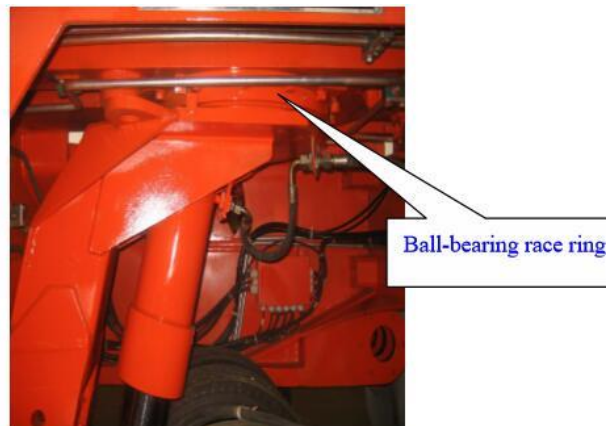
steering rods

The modular has a hydro-mechanical all-wheel system with a two-circuit system, which ensures that the steering system maintains its functionality even when one or more steering circuit fails.

The modular transporters have two types wheel bogie steering system. The two system include ball bearing race ring and pivot bearing.



Modules with Pivot Bearing



Modules with Ball-Bearing Race Ring

modular unit wheel bogie steering

1. **Ball bearing race ring**

The steering system used in a modular transporter determines the types the operation and terrain that the transporter can handle. The modular transponsters with ball bearing race ring steering systmes are designed for off-road operations.

The transporters can bear heavy loads within a site. Their structure are well-engineered for safe and top performance in heavy-duty operations.

2. **Pivot bearing**

Hydraulic modular transporters with pivot bearings are designed for heavy-duty on-road transport operations. The transporters have reinforced frames that enable them to handle axle loads. These transporters are ideal for in-plant operations.

The mechanism of steering uses two ways to steer the axles. The two ways include:

1. Self-steering: When the tractor or truck is steering, its drawbar or gooseneck delivers a signal that makes the axles to start steering at the same time.
2. A remote control or valve switch is used as a manual control for axle steering.

8.4 Hydraulic system

The pump in a modular transporter uses the hydraulic technique, which is effective in controlling the driving speed.

The steering and suspension pumps use the constant pressure controller to realize a quick response whenever they need steering power.

The driving motor switches between driving and follows uses a large torque radial motor. All the hydraulic cylinders in the transporter have anti-block valves, which are important when the pipe line is broken.

8.5 Brake system

The modular unit is equipped with a compressed air brake system. The system consists of double brake chambers, single brake chambers, relay valves, brake drums, and reservoirs.

The brake system consists of tow brake lines that function as the service brake and the parking brake.

8.6 Hydraulic suspension

The individual swing axles in a hydraulic modular trailer consist of the hydraulic suspension, which can be connected to different support circuits.

The purpose of connecting the suspension to different circuits is to ensure that the axles have equal loads.

When the axles have equal loads, you are guaranteed of the optimal lengthwise and crosswise leveling even if you are driving on uneven terrain. The equal loads also regulate extreme cross falls.

8.7 Lifting system

The total lifting length of modular unit's



(a)



(b)

platform is

600mm.

The platform gives a compensation of $\pm 300\text{mm}$, which is enough compensation for the axial load.

The suspension cylinder is installed as the steer wheel bogie.

The two ends of the suspensions have joint bearings, which protect the cylinder from damages.

The hydraulic accumulator provides good cushioning when the modular transporter is unloaded.

8.8 Combination system

All modular units can be combined side-by-side or from end-by-end. A hydraulic link-pin is used to combine modular units end-by-end.

Combining hydraulic and brake pipeline requires fast coupling connectors, which have a high performance level. The electric interfaces use a heavy connector, which is reliable.

8.9 Power pack

The hydraulic power pack and the controlling devices of the hydraulic modular transports can perform various functions include steering, adjusting, and maintaining the vehicle combination.



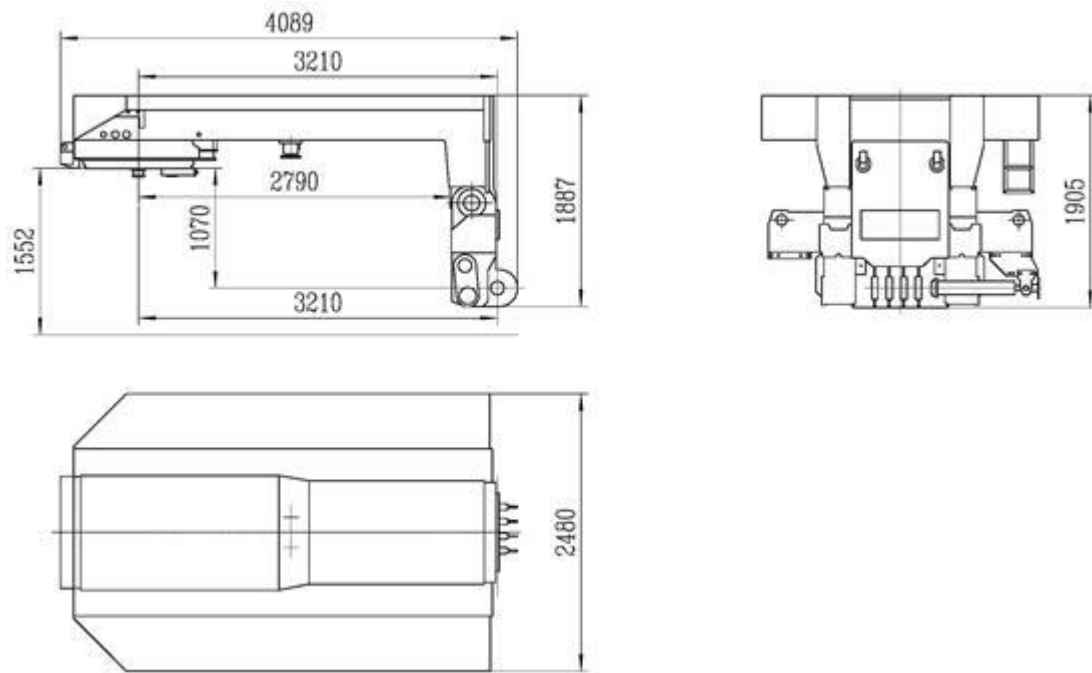
power pack

The power pack is different from the PPU in its function and performance. The power pack cannot provide the same high power like the PPU. It can only power to steer the modular trailer but the power cannot drive the axles.

8.10 STZ-V Gooseneck

When the tractor truck is steering, the STZ-V gooseneck will deliver signals that makes the axles steer at the same time. Hydraulic gooseneck also has a lifting function that can adapt to the height of the cargo platform.

Sometimes the fifth wheel and gooseneck bear part of the cargo weight. The gooseneck is considered the best alternative to the drawbar equipment.



STZ V gooseneck

Connecting the front axle line cylinders with the gooseneck cylinders guarantees the load transfer from the axle lines to the gooseneck.

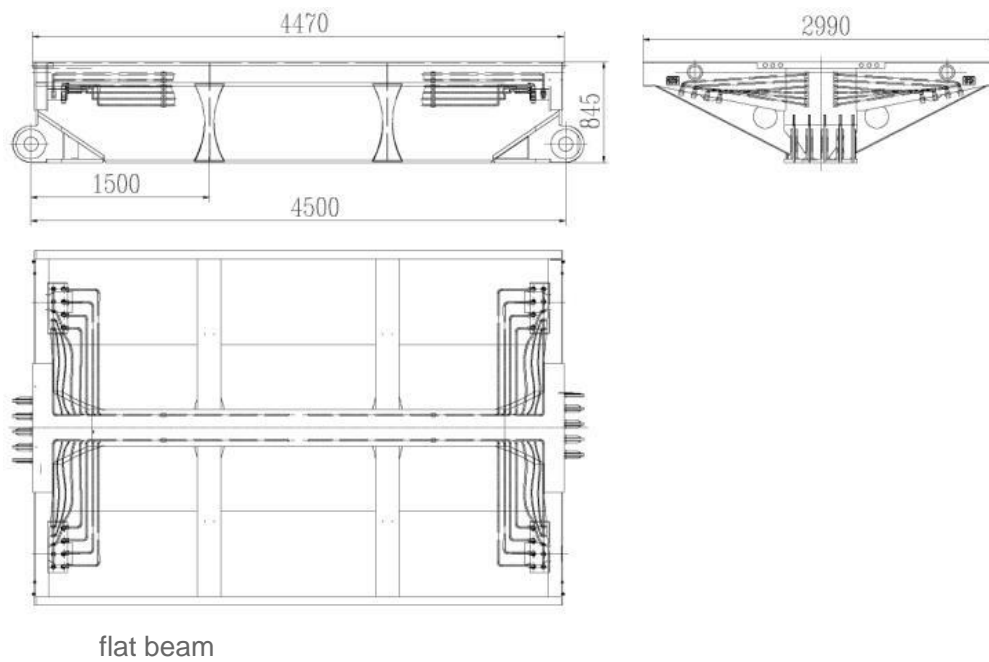
This connection eliminates the need to add more weight to the truck tractor to generate enough traction force. The ratio between the axle load and the fifth wheel load can be adjustable both hydraulically and mechanically to a wide range.

Goosenecks in modular trailers have two pairs of steering cylinders that supply the front and rear steering systems of the trailer. The coupling height and clearance of the rear gooseneck can be adapted to fit most of the truck tractors in the market.

8.11 Beams

The concave beam, flat beam and the frame beam are engineered for the tanks and over height and over length goods.

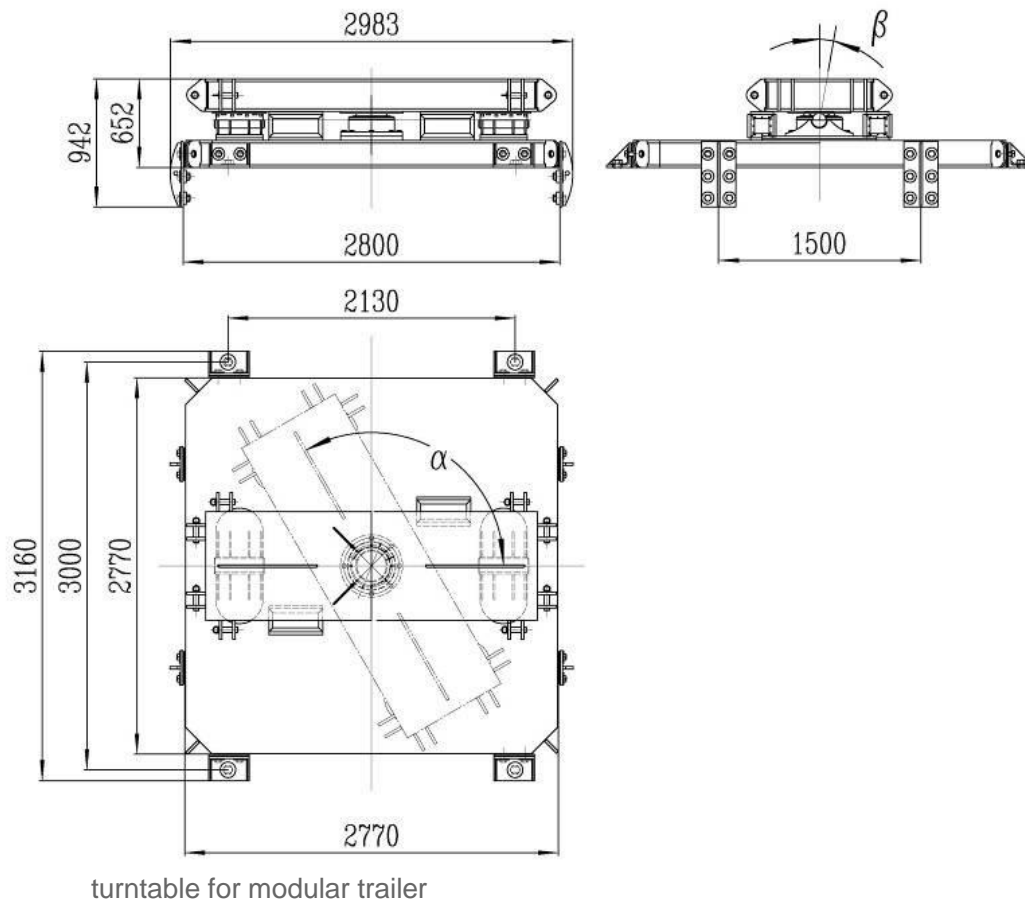
The flat beam comes in different dimensions including 4.5 m and 6 m while the concave beam is normally 10 m in length.



8.12 200 Ton turntable

The 200 ton turntable is used to transport over length goods that cannot be transported with other structures of modular transporters.

As the name suggested, the turntable has a weight limit of 200 ton, which means that is cannot transport over length goods that are above 200 tons. The turntable should be used in pairs and on a modular combination trailer.



Many modular transporters have a front and rear turntables that enable them to transport long and heavy loads. The front turntable in most cases uses a purely mechanical system while the rear turntable uses a hydraulic self tracking device.

The front turntable can have 1-point or 2-point bearing depending on the requirements. The bearing is adjusted by the removable sliding shoes.

The device in the rear turntable operates the rear dolly automatically. The turntable bearings are not limited to 1-point and 2-point bearings.

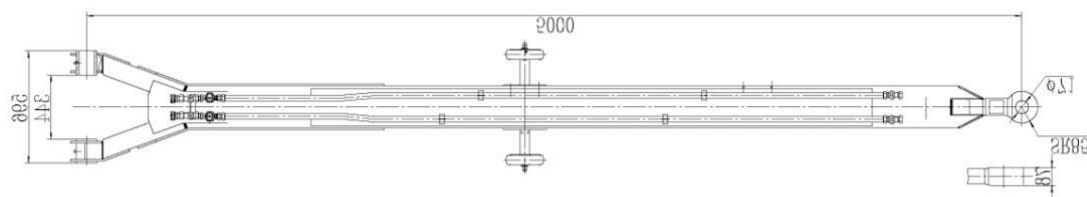
You can order a customized turntable for a 3-file combination or 4-file combination trailers. The customized turntables may come with load repartition frames depending on your preference.

8.13 Drawbar Equipment

The drawbar is the main accessory in a modular transporter. The drawbar can have different dimensions including 2.5 m, 3 m, and 5 m. A drawbar is sometimes used to pull or push a modular platform.

Transportation companies prefer modular trailers with drawbar equipment because they offer high maneuverability even in the most difficult situations. The easiest way to operate a modular trailer is using the drawbar equipment.

A modular transporter that has a drawbar on each edge can easily change the driving direction where necessary.



Drawbar Equipment

Some manufacturers use a common rule of thumb that all trailers with more than 18 axle lines should use a drawbar system instead of the common gooseneck system.

Drawbar trailers are often assembled or combined in 3-file or 4-file side by side combinations. The purpose of these combinations is to reduce axle loads, increase the payload or to improve the bending moment usage.

8.14 Electric system

The modular trailer has a power pack with a rated voltage of 24 V. The equipment in the trailer that use electronic monitoring and control have an LCD color monitor.

The micro control system has a special controller whose function makes the control system of the module unit more stable and reliable.

The system also has a CAN bus that enables data transmission from one controller to another and from the controller to the displayer.

The displayer has several functions including the normal monitoring and operation. It also has settings for the meter display, lighting alarm, and lighting.

The meter display shows the speed, water temperature, pressure of the braking system, oil pressure, and engine speed.

The lighting alarm shows the hydraulic filter alarm, fuel oil lower alarm light, air pressure brake warning light and engine oil pressure alarm light.

It also consists of the parking brake indicator, accumulator charging indicator, cooling indicator temperature alarm and engine filter alarm.

The third function of the displayer is the lighting, which consists of the blinker, warning light, side light, and reversing light.

8.15 Additional accessories

Hydraulic modular transporters come with different accessories depending on their configuration and combination form. The different combination forms are discussed in detail in chapter nine.

Manufacturers give a wide range of accessories to enable users to customize their modular transporters to suit different operations.

Some of the accessories that come with these transporters include goosenecks, radio controls, and hydraulic bolt couplings.

Other accessories include hydraulic power packs, steering heads, load spreaders, long-load turntables, side-by-side devices, and pulling devices among others.

Sometimes the accessories are already installed in the modular trailer depending on the manufacturer's preference.

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Chapter Nine: Combination Forms of a Modular Trailer

The modular combination hydraulic trailer has the capacity to achieve 3 towing forms. The forms are possible when the entities in the vehicle are connected with different combination accessories and auxiliary equipment. The three forms include a semi-trailer, trailer, and self-trailer. The modular hydraulic trailer can realize three major combinations including:

Combination with drawbar: The combination includes the drawbar, vehicle entity, and side steering frame

Combination with STZ-V gooseneck: It involves the STZ-V gooseneck and vehicle entity

Combination form or self-towing: The modular trailer can achieve self-towing through a combination of several components that include the PPU device, module unit, and self-propelled module unit. The power device supports multiple functions that include hydraulic driving, air brake system, hydraulic lifting system, and hydraulic steering.

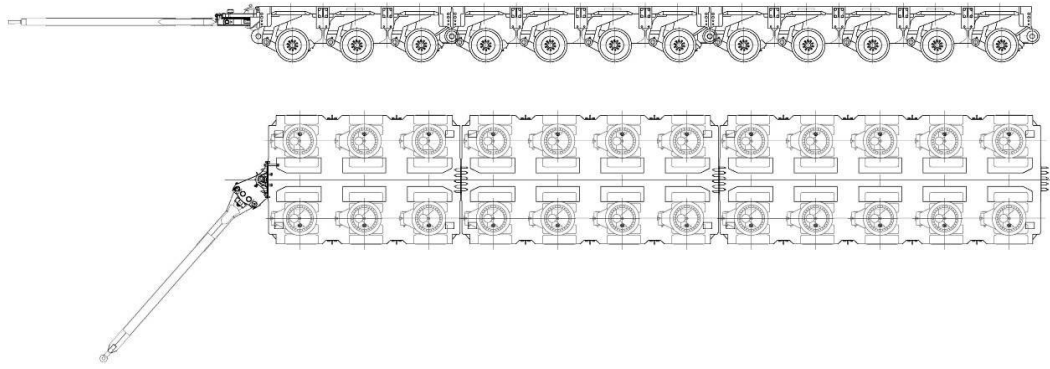
The modular trailer with this combination form can replace the traditional vehicle completely in a specific transportation environment, that is, transporting overweight goods at speed below 5km/h. Let us now look at the combination forms in details.

9.1 Combination with drawbar

This form of combination is in different series include the 2-file, 3-file, and 4- file combination with drawbar. The main difference on these combinations is the type of accessories used. Each of these combinations is outlined below.

2-file combination with drawbar

This combination consists of the drawbar, power pack, modular unit, side steering frame and the combination accessories. You choose the modular unit based on the type of goods you want to transport.

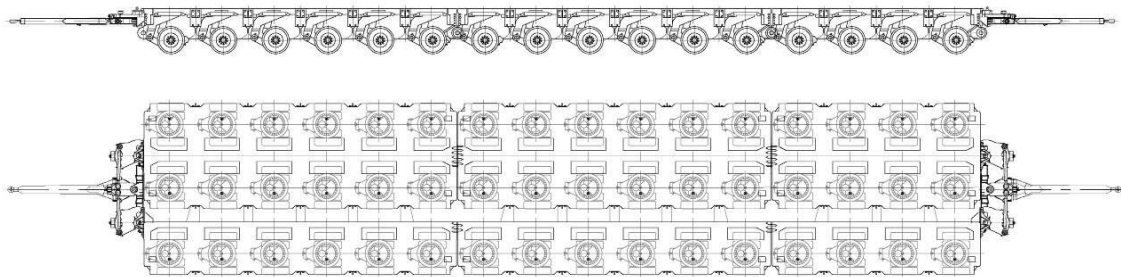


2 file combination modular trailer

You can get a modular unit of up to 32 axle lines. You can also choose other equipment that work together with the 2-file combination with drawbar such as a flat beam or a low flat beam

3-file combination with drawbar

The 3-file combination with drawbar comes with the drawbar, power pack, side steering frame, modular unit, combination accessories, half modular unit, central steering frame 1 and central steering frame.

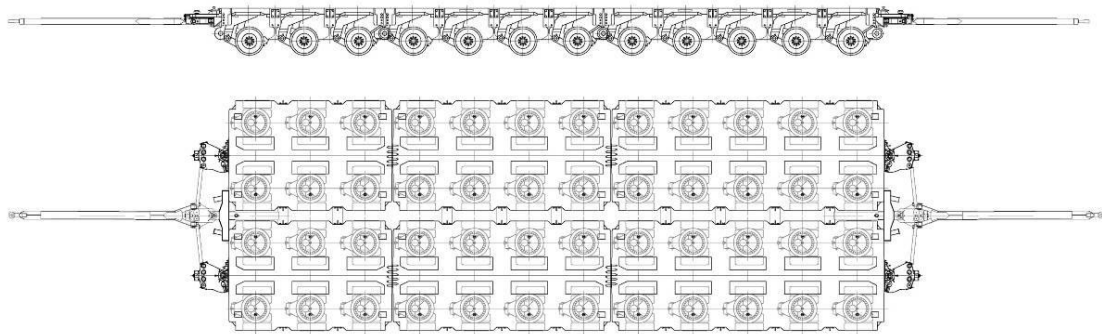


3 file combination modular trailer

You can tell from the components that the 3-file combination is better than 2-file combination with drawbar.

4-file combination with drawbar

The combination consists of a drawbar, power pack, central steering frame, modular unit or half modular unit, side steering frame, and the combination accessories.

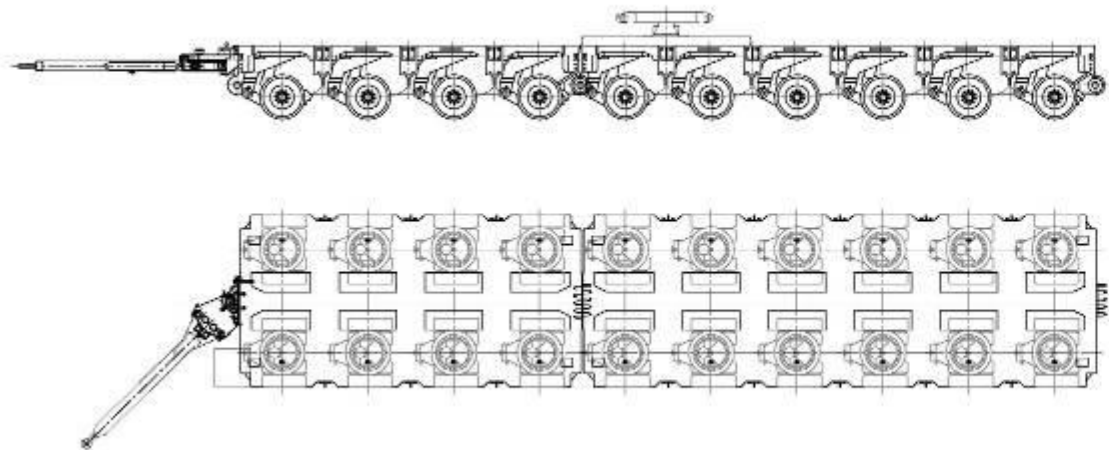


4 file combination modular trailer

For all the file combination with drawbar forms, you can get modular units of up to 32 axle lines.

9.2 Combination form of the turntable

The combination form of the turntable has a drawbar, turntable, modular unit, power pack, side steering frame, and the combination accessories.



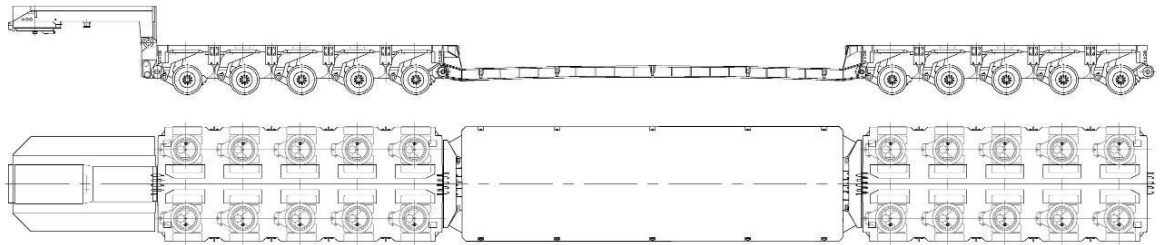
turntable combination modular trailer

The varying component in this combination is the turntable. The turntable is used in pairs when the modular transporter is carrying over length goods.

9.3 Combination with STZ-V gooseneck

This combination consists of the STZ-V gooseneck, modular unit or half modular unit, power pack, and the combination accessories.

The modular units that have this form of combination have up to 16 axle lines. Hence, you can choose the right modular unit for your type of goods.

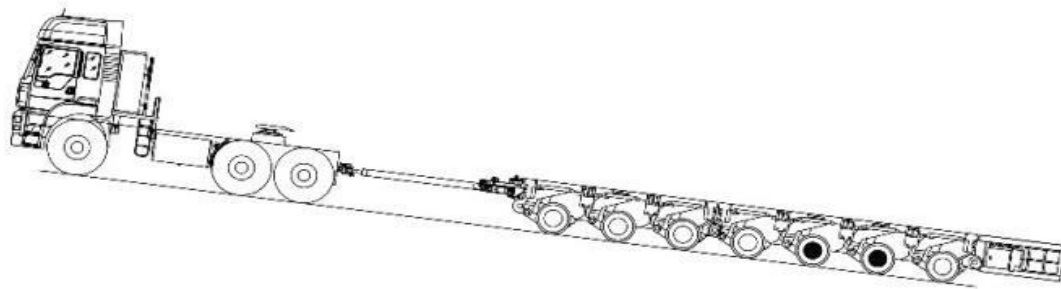


gooseneck combination modular trailers

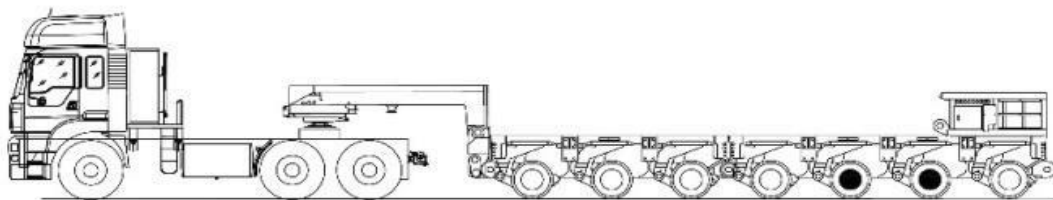
The only limitation with this combination and its type of modular unit is that it may not transport over length goods. You can also add other auxiliary equipments to the chosen modular unit such as a flat beam.

9.4 Pulling work model

Sometimes the tractor truck does not have enough power to pull the modular trailer from one location to another. In such an instance, a PPU is added to pull the trailer.



Booster working mode



Pulling working mode

pulling modular trailer

Chapter Ten: Modular Transporter Forecast

China is one of the leading suppliers of modular transporters in the world. Despite the quality concerns that many people on the goods manufactured from China, the country continues to lead in supplying heavy-duty vehicles. The reality is that the manufacturers produce goods for all categories of markets. Some vehicles are assembled for the low-end market while some are designed for the high-end market. In fact, some manufacturers in China assemble heavy-duty vehicles for some of the top suppliers in foreign countries.

You can order for a high-quality, sturdy, and long-lasting modular transporter from the country. However, you must choose the right supplier to get the right product. In this

chapter, you will learn how to choose the right supplier for a modular transporter. You will also learn how the state of modular transporters in China.

10.1 How To Choose A Good Supplier In China

China has so many suppliers of modular transporters that claim to provide the best transporters in the world. If you do a quick online search, you will find many advertised module transporters.

Buyers are sometimes confused in selecting the suppliers because the specifications of the vehicle seem similar. Buying a modular transporter is an expensive good to buy.

You do not want to take the risk of buying the wrong model or a low standard vehicle. Below is a guide on how to select a good supplier in China. The guide shows the most important aspects to consider when selecting the suppliers.

- **Quality**

The quality of a product is one of the top considerations when choosing a supplier. The best supplier of a modular transporter should guarantee you of high quality vehicles. You will find claims from all suppliers that their vehicles are a high quality. Hence, you must go beyond the advertising messages and check the production processes. If a supplier is certified, you are likely to get a high quality modular transporter.

Another way to check the quality is to ask about the manufacturing processes. High-welding performance is required for the components of modular transporter to be strong enough. Poor manufacturers will hasten the welding processes to finish the products fast. Go for a supplier that follows the right manufacturing procedures. Do not forget to check reviews and recommendations from other customers who have already bought module transporters from the same suppliers.

The good thing about purchasing a product like a module transporter is that you can inspect the components before buying. Inspect all the components include the quality of steel used and welding. Compare the same model of a transporter from different suppliers before making your final decision.

- **Factory strength**

Another important consideration to make when choosing a supplier is the supplier's factory strength. The quality of components that the supplier uses in the modular transporters depends on the factory strength. Take time to investigate the nature of

factory or assembly unit that the supplier operates. Some suppliers are not directly involved in assembling module transporters. Instead, they buy the transporters from manufacturers and resell them to buyers at a profit.

One of the important lessons you can learn when comparing suppliers from China is to identify that actually manufacturer their products. Try to ask questions about the manufacturing process and check their level of knowledge on the same. Some suppliers will be direct and inform you that they do not have the technology to assemble modular transporters. Others will give the impressions of a well-equipped factory. Visit the factory where possible and have a first-hand experience of the manufacturing process.



heavy duty transporter

- **Service**

You can determine if you are dealing with the right or wrong suppliers based on their quality of customer service. Buying a modular transporter is a sensitive process that involves constant communication and negotiations with suppliers. You do not want to spend huge amounts of money on the wrong transporter. The supplier should be willing to answer all your questions, especially concerning the specifications of different models. Avoid suppliers with rude and unprofessional customer care representatives.

The right suppliers hire competent people to work in the customer care team. If you cannot reach the supplier on the provided communication lines, you need to look for another supplier. You also need to consider an alternative supplier if it takes a long time to get a response from the suppliers. The delays in communication or giving feedback may be an indication that the supplier is not directly involved in manufacturing the modular transporter. The staff has to consult the real manufacturer before addressing your questions.

- **Technology**

The type of technology that a manufacturer uses in the production process influences the quality of the final product. The best manufacturers invest in the latest technology to assemble modular transporter. You can expect a safe, reliable, durable, and sturdy modular transporter from a manufacturer that uses the best technology. This requires research to certify that indeed the supplier has the technology in the factory. Remember that suppliers use all types of marketing tactics to advertise their products.

If you can visit the factory and inspect the technology, you can make an informed decision. However, this is not always possible for all buyers. The supplier's website and other online platform can give you some clues on the technology in the factory. Another reliable source of information on technology is the previous buyers that have visited the assembly unit. Always go for a supplier that continually upgrades production technology. The good thing about buying from China is that most manufacturers are quick to adopt advanced technology because of the stiff competition.

- **Price**

Start the purchase process by defining your budget for the module transporter. Consider the amount that your business can easily pay for the transporter without affecting the cash flow. Once you set your budget, compare prices of the same model of modular transporter from different suppliers. Remember that both SPMTs and hydraulic modular transporters come in different structures as described in the previous chapters. The prices vary depending on the specifications. Hence, you must compare the specifications when comparing the prices.

The purpose of comparing prices is to identify the supplier with the fairest prices in the market. However, do not settle for low quality transporters to save on costs. The buying price is not the only cost that you incur when you buy a heavy-duty vehicle. Consider the cost of maintaining the transporter in a good working condition. If you buy a cheap modular transporter, you are likely to spend a high amount on maintenance. The components of such a vehicle have a short life span.

A modular transporter may be expensive upfront but its maintenance cost will be low if the supplier uses high-quality materials. This does not mean that all expensive transporters are of good quality. Some suppliers offer their products at high prices even if the quality is average. Remember that you have a budget to consider in the purchase. Conducting a good market research will help you identify the highest quality you can get within your budget.

- **Customized products**

We have stated in previous chapters that modular transporters can be combined in different forms to transport over length cargo. The type of goods that your business

transporters or handles is among the top aspects you should consider when buying a heavy-duty vehicle. You want a vehicle that can accommodate the cargo of all dimensions and transport it safely. The best suppliers customize their vehicles depending on the client's needs. Hence, you can get a modular transporter with a specific number of axle lines depending on your cargo.

Sometimes the manufacturer can adjust the beams and platform to ensure the transporter meets your needs. Hence, after comparing the quality and prices of different suppliers, consider their ability to customize the module transporter for you. Your business will reap maximum benefits from a customized vehicle because you are guaranteed that it will transport all types of goods.

10.2 The State Of Modular Transporters In China

The transportation industry in China has been undergoing development as manufacturers adopt the latest technology in their factories.

One reason why manufacturers have been adopting new technologies is to keep up with competitors from other countries in the world.

The manufacturers have also been adopting the latest technologies to avert the notion that Chinese products are of low quality. As you shop for a modular transporter from the country, you need to know the real state of the industry as outlined below.

- **The industry is experiencing rapid development**

The demand for modular transporters from China has rapidly increased in the recent years. Foreign companies had dominated the market for these transporters for many years. The companies had access to the best technologies to assure their clients of long-lasting and high-performance transporters. As manufacturers in China invest in the same technology, they have been able to guarantee their clients of the same high quality.

Another factor that has contributed to the rapid development in the industry is the high price of modular transporter from other countries. Many business owners are turning to the Chinese market for affordable yet high-quality modular transporters. Chinese suppliers also beat foreign companies in offering timely services to their clients.

- **Many suppliers in the industry**

As the demand for affordable module trailer increase, more and more suppliers have been joining the industry. Hence, buyers have many suppliers to choose from when exploring the Chinese market. The entrant of new suppliers is beneficial to buyers because suppliers have to offer fair prices to stay in business. However, many suppliers are still offering the same old models of modular transporter.



ANSTER modular trailer

Some suppliers are still using the obsolete models from foreign companies in the manufacturing processes. Such prototypes have restricted growth in the industry. A few suppliers are breaking away from this trending by trying to offer the latest model of transporters. Suppliers like ANSTER have modern designs of modular transporters, which are associated with higher levels of performance and efficiency. Consequently, the brand competes effectively with other brands in the global market.

- **ANSTER can now supply 48 tons per axle load**

The latest models of transporter have a high loading capacity. The models are compatible with foreign brands. The high axle load technology should improve the technology used in three major systems. The systems include the structural strength of the vehicle, hydraulic system hoisting capacity, and the capacity of the running gear axle and tire bearing.

The engine and hydraulic system of the ANSTER modular transporter use German parts.

Classification	Equipment, components	Supplier(or brand)	The origin of product
Mechanical drive	Diesel engine	MAN	Germany
Hydraulic system	Drive hydraulic pump	<u>Rexroth</u>	Germany
	Steering pump	<u>Rexroth</u>	Germany
	Reducer	<u>Rexroth</u>	Germany(Chinese factories)
	Hydraulic drive motor	<u>Rexroth</u>	Germany
	Steering proportional sandwich valve	HAWE	Germany
Electrical control system	Angular sensor		Imported brand
	Radio remote controller		Imported brand
	ECU		Imported brand
	Display		Imported brand

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engine and hydraulic system

The model is compatible with Goldhofer, which one of the top brands in the global market for heavy-duty transporters.



compatible with goldhofer

Conclusion

Modular transporters are used to transport the heaviest loads in the world in various industries. The major types of modular transporters are self-propelled modular transporters and hydraulic modular trailer. The differences between the two types lie in their structure, specifications, and loading capacity. SPMTs are designed in two major types that include the 2.43m and 3m SPMTs. The SPMTs use a hydraulic system that controls various functions including driving, lifting, cooling, braking, and steering. Other major components include the steel frame, the electronic system, and the power pack unit. An SPMT can use either an electronic or a mechanical steering system.

A self-propelled modular unit without a power pack unit resembles a modular trailer. However, modular trailers specifically use a mechanical steering system and can be combined using a drawbar or gooseneck. Most of the components of the SPMTs are also used in assembling the hydraulic modular trailers. However, the latter have additional

accessories such a drawbar, turntable, bolt couplings, steering heads, and the STZ-V gooseneck. Modular trailers use different combinations including the self-towing, STZ-V gooseneck, drawbar, and turntable combinations.

The knowledge of the specifications and functionality of modular transporters will help you select the best model for your company. However, you also need to consider the quality standards, prices, factory strength, and technology of different suppliers. China remains one of the best markets to buy a modular trailer. You can get models of modular transporters that are compatible with other international brands. If you choose the right manufacturer like ANSTER, you will get a modular transporter with a firm structure and a high loading capacity.

Contact us, get more drawings now!!

info@anstertrailer.com