OVS

HEAVY-DUTY TRUCK-MOUNTED SWEEPERS

Date of Issue: 17/06/2021 **Revision:** 00

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1. GENERAL INFORMATION

1.1. Introduction

This catalog is designed in nine chapters for OVS series equipment to ease access and use. Parts Lists, User Manuals, Labels, Hydraulic and Electrical Schemes, and Fault Detection and Maintenance sections are included in the catalog.

The information contained in this booklet should be carefully read and properly understood before starting to use or perform maintenance on the equipment. Failure to follow written instructions can result in personal injury or equipment damage.

The Product Booklet should always be available with the equipment.

Orakçı Makina reserves the right to make technical changes on the equipment and in the booklet without prior notice.

1.2. Description of Parts List

Below is a sample list showing the parts. The use of the sample list will be explained.

Reference, part code, description and quantity information are given in the lists.

The reference indicates the index to which the part numbered in the product image belongs.

The part number specifies the code for the part of the given index.

The description identifies the part that belongs to the given code.

The pieces information indicates how many pieces are used in the picture shown.

Optional information is used to describe features that are optional in the equipment. The names of abbreviations used are as follows.

O: Indicates that the equipment has optional features. Optional feature varies according to customer's special requests. May not be found on equipment.

S: Included in equipment as standard.

D: Has a variable code. The code of the part varies according to the features of the equipment requested by the customer.

In the light of this information, orders or description of the relevant part can be easily made from the lists in the user manual.

Ref	Part Code	Description	Optional	Quantity
1				

1.3. Spare Parts Supply Method

Equipment serial number (TYPE) and the frame number (VIN) are placed on the Pedigree Label on the equipment.

When ordering spare parts, the equipment frame number, part description, part code, and requested quantity must be written in the request form. This will ensure that the right product reaches you in a short time.

Please contact Orakçı Makina A.Ş. for spare parts and service.

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2. TERMINOLOGY

The Heavy-Duty Truck-Mounted Sweepers consist of the “Body” placed on the chassis, the “Sub Group” formed by the brush and bucket groups connected under the chassis, and the hydraulic and electrical installations. In Figure 2.1, Heavy-Duty Truck-Mounted Sweepers are shown

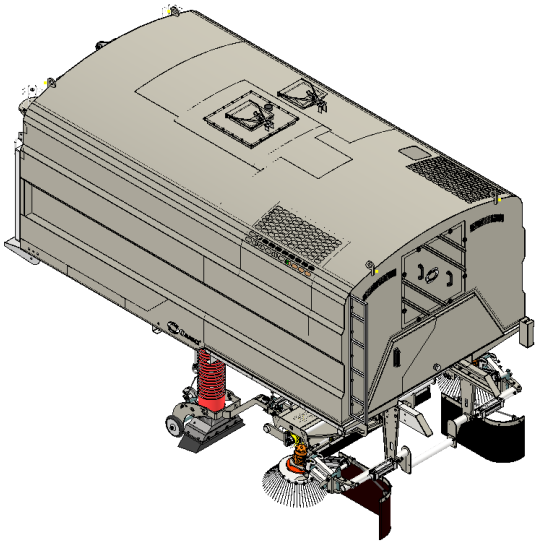


Figure 2.1 : Heavy-Duty Truck-Mounted Sweepers

The functions and load distribution of the Heavy-Duty Truck-Mounted Sweepers are arranged in accordance with the technical specifications of the truck placed on it. The main components of the equipment are shown in Figure 2.2.

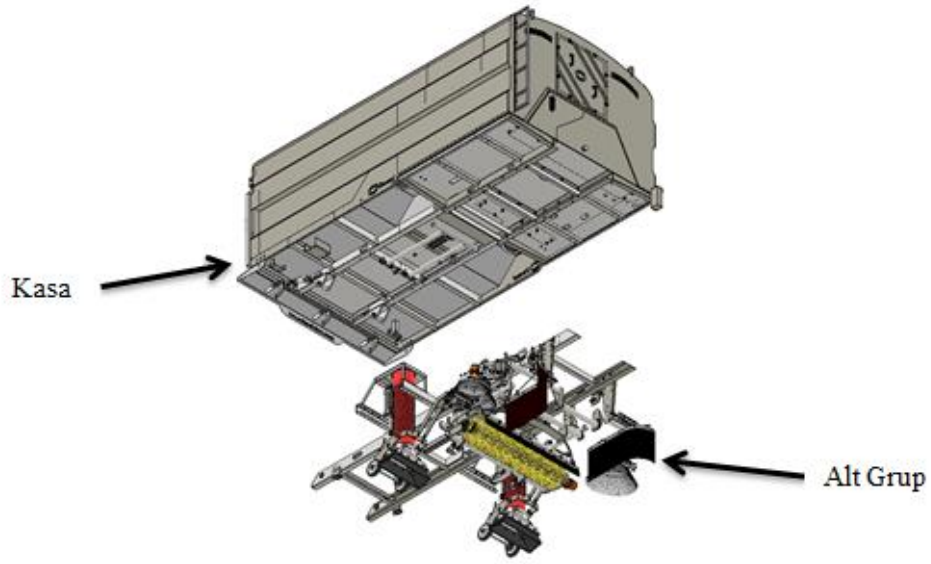


Figure 2.2 : Heavy-Duty Truck-Mounted Sweepers Main Components

2.1. Body

It is the structure consisting of the combination of the auxiliary engine in the engine section of the equipment, the suction fan, and the garbage collection chamber. It is shown with an arrow in Figure 2.2. The body is supported by rectangular horizontal steel profiles and is connected to the chassis of the vehicle with bolts.

The body has high endurance. It is produced from S355J2+N sheet with high strength and wear resistance. Only the bottom of the tank is made of 316L stainless steel sheets for high corrosion resistance.

There is the suction fan, auxiliary engine, oil tank, electrical panel and damper piston in the engine compartment seen in Figure 2.3 within the general assembly of the body. Behind this compartment, there are other sections such as the water tank and waste reservoir. This auxiliary engine brand and model can be selected by the customer among the options we offer.

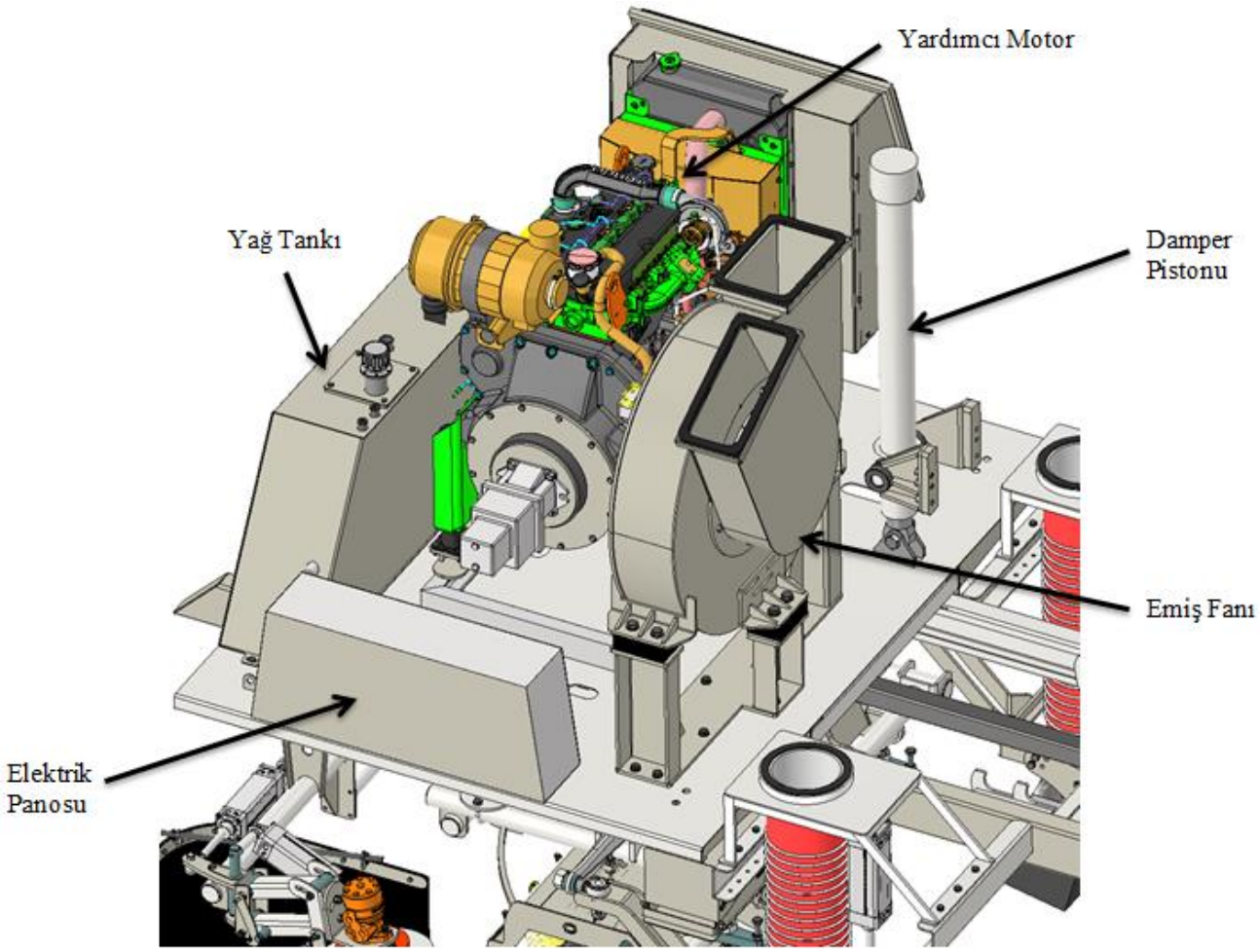


Figure 2.3 : Engine Compartment

2.1.1. Auxiliary Engine

The auxiliary engine functions by feeding the vehicle on which the equipment is placed or from a separate fuel tank and driving the hydraulic pump. All power transmission is carried out by driving the hydraulic pump and converting the hydraulic power back to mechanical power by the hydro-motors. The auxiliary engine is shown in Figure 2.3. Apart from the customer's special requests, its main functions are:

- Driving the suction fan,
- Driving the side brushes and the middle brush

2.1.2. Suction Fan

The suction fan converts the hydraulic energy transmitted to it into mechanical energy thanks to the hydro-motor on it and turns the fan wheel. In this way, it absorbs from the right or left bucket or from the rear suction hose, preferably through the suction chimney. It expels the air it absorbs through the blast chimney. The suction fan is shown in Figure 2.3. Apart from the customer's selections, its main functions are:

- Providing suction power by turning the fan wheel,
- The transmission of the suction power in the desired direction through the fan chimneys

2.1.3. Oil Tank

The oil tank ensures that the hydraulic oil circulating in the system is cooled, rested, and cleaned with the suction and return filters by the water installation pipe passing through the tank. The position of the oil tank is shown in Figure 2.3.

2.1.4. Electrical Panel

It is the panel where the fuse board where all the electrical cables on the equipment are collected and the block where all the pneumatic hoses on the equipment are collected is also mounted. These two systems communicate with each other and with the touch control panel inside the cabin and they control of the equipment. It is protected by a panel lock to prevent unauthorized intervention. The electrical panel is shown in Figure 2.3. Apart from the customer's special requests, its main functions are:

- Transmitting the commands from the touch control panel with electrical and pneumatic systems,
- Easy repair and maintenance of electrical and pneumatic systems.

2.1.5. Damper Piston

It lifts the chassis with the drive it receives from the PTO (Power Takeoff) and enables easy repair and maintenance operations. In addition, it also ensures that the wastes collected in the waste container are poured and the discharge process is carried out. The position of the damper piston is shown in Figure 2.3.

2.1.6. Water Tank

The water tank, made of 316 L stainless steel and has a sufficiently large volume according to the equipment volume, has a high level of corrosion resistance. In addition, the installations of the water filling and discharge systems are designed to be highly resistant to corrosion and not leak-proof. It provides the water for the irrigation system during operation. With the sensor system, the current water level can be viewed on the control panel and it gives a water filling warning. The position of the water tank is shown in Figure 2.4.

2.1.7. Waste Reservoir

It consists of a floor panel made of stainless steel and side walls that keep waste adhesion to a minimum, suction chimneys, a suction screen, and a tailgate that can be opened and closed independently from the dampers. While it is closed during the sweeping process, the waste reservoir whose fullness can be controlled with the sight glass can only empty the wastewater through the discharge valve when necessary. In addition, with the help of a damper, it can discharge all the waste that is inside of it by opening the tailgate. The position of the waste reservoir is shown in Figure 2.4.

2.1.8. Suction Hose

It is a flexible hose system with a cylindrical holding pipe that allows the suction hose to be fixed on the bed on the tailgate, and the waste that is not on the road to be easily removed by the operator. The position of the suction hose is shown in Figure 2.4.

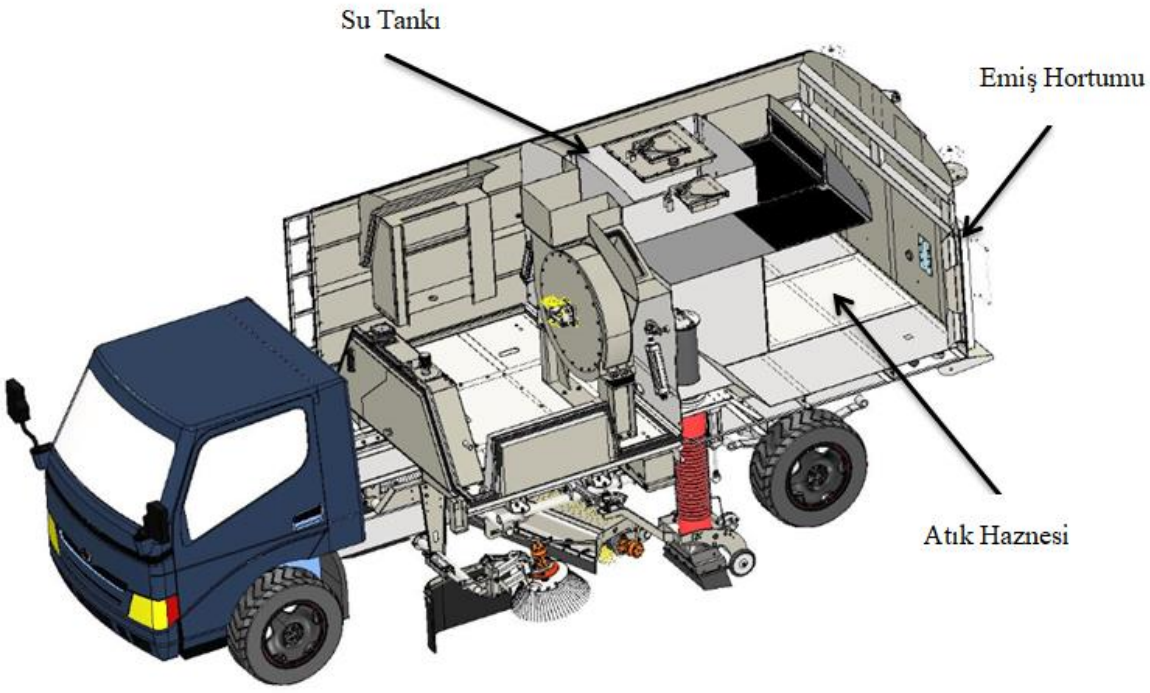


Figure 2.4 : Body Compartment Overview

2.2. Sub Group

The sub group is the chassis to which all the systems under the chassis are connected and the main group consisting of the combination of these systems. The positions of the systems in this group to the ground are determined, but the bolt connection points on its own chassis and vehicle chassis may vary according to the vehicle in order to have the ability to tolerate vehicle-induced differences.

The sub group has a high-strength chassis and maneuverable systems working in conjunction with it. The chassis is made of S355J2+N sheet metal with high strength and abrasion resistance, and other systems are made of plastic, rubber derivatives, iron derivatives and manufacturing steel, in addition to this material.

The sub group consists of sweeping system, suction system, irrigation system, mud guards and manual washing system. The sub group systems are shown in Figure 2.5.

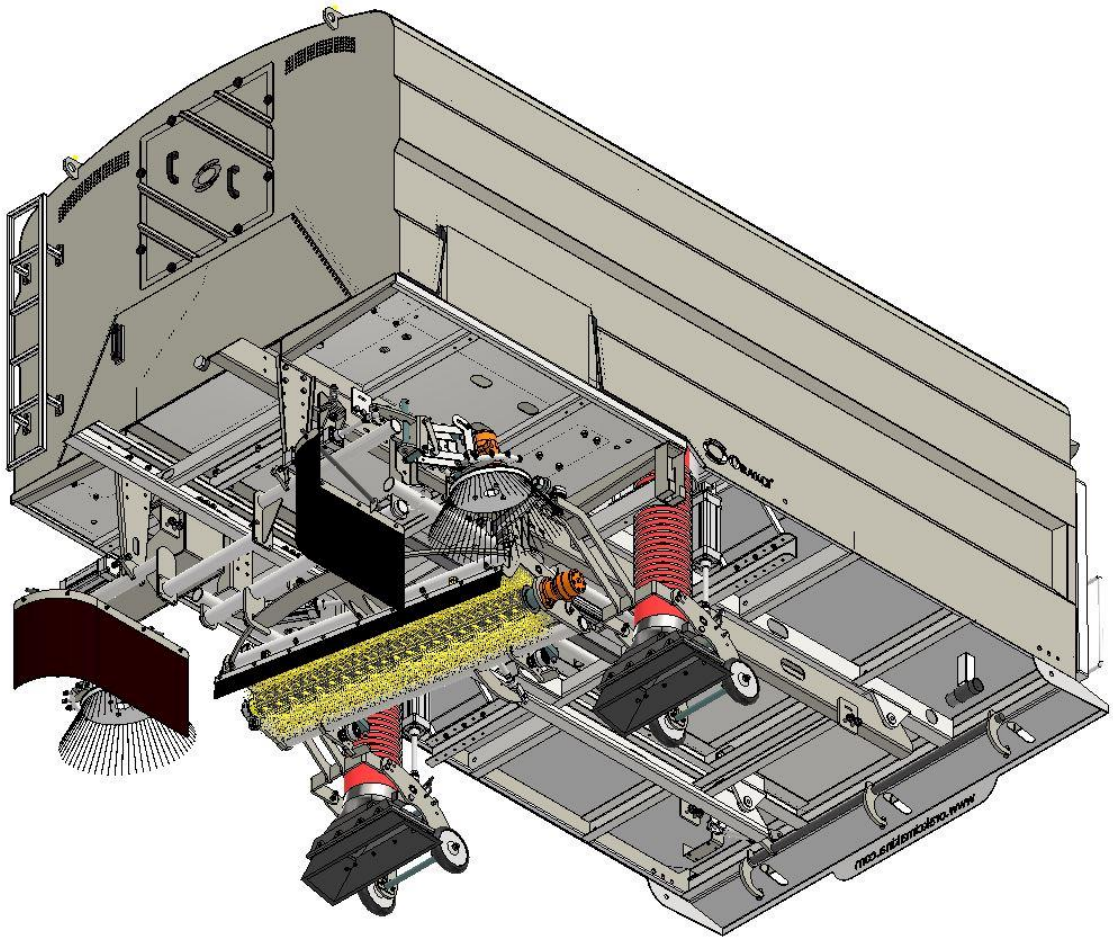


Figure 2.5: Sub Group

2.2.1. Sweeping System

The sweeping system consists of left, right and middle brushes. Only left or only right directions can be selected for sweeping. According to this selection, the middle brush comes to the symmetrical direction at the same angle towards the open brush and performs the sweeping operation. As a result of this process, after the wet or wetted waste comes out, it is brought as a line in front of the suction bucket. The position of the sweeping system is shown in Figure 2.5.

2.2.2. Suction System

This is a system that works when the bucket on the same side as the selected brush group descends to the ground and transmits the suction power produced by the fan, when the rear suction hose is not used. This ensures that the right or left flap, which is another element of the system, opens simultaneously with the descending, whichever side is opened, and this process takes place. The position of the suction system is shown in Figure 2.5.

2.2.3. Irrigation System

It is a system that wets the dust and other wastes on the road for easy sweeping in dry weather conditions with the sprinklers on the stainless chrome pipe located in front of the brushes. The sprinkle flow can be adjusted with the valves on it, and this system can be turned off and on without leaving the cabin, thanks to the touch control panel. The position of the irrigation system is shown in Figure 2.5.

2.2.4. Mud Guards

The mud guard is the part that is used to prevent mud from coming from the wheels or to prevent dirt from coming to the cleaned road during the operation of the vehicle. The mud guards are shown in Figure 2.6.

Figure 2.6 : Operating Sub Group

2.2.5. Manual Washing System (Optional)

It is a system consisting of a pressure washer gun and a reel hose, which enables the need to clean the swept area with lots of water easily and quickly, and small wastes stuck to the floor and walls after emptying the waste reservoir.

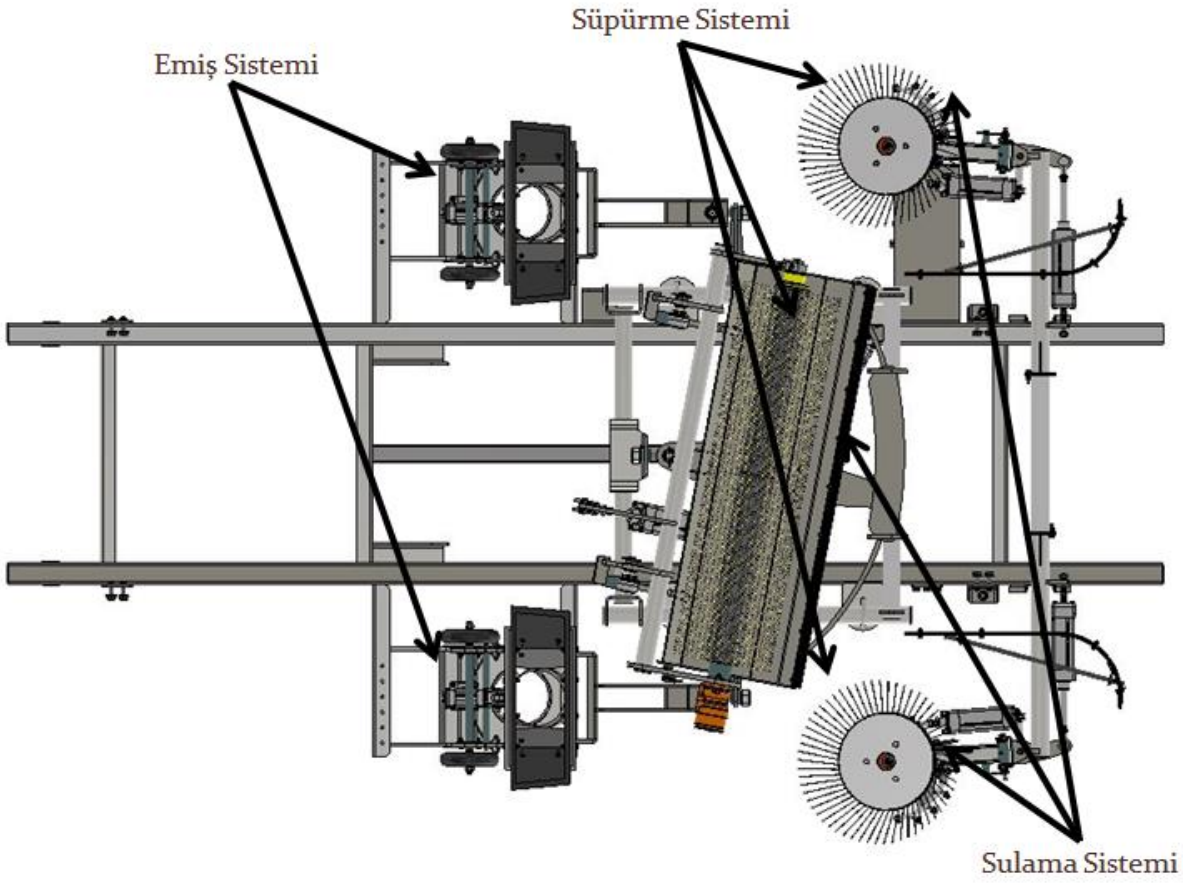


Figure 2.7: Sub Group Systems

3. ASSEMBLY CONDITIONS

Applied training must be given by the Orakçı Makina team on the first delivered product (inside the contianer, on-vehicle). This matter is important and necessary for the continuity of warranty conditions and customer satisfaction. All errors that have occurred or may occur in the assemblies made by the customer other than the supervision of Orakçı Makina and not assembled by Orakçı Makina will be considered out of warranty.

3.1. In-Container Shipping Conditions

The delivery of our equipment to the customer is made by loading the sub-assemblies required for the vehicle-free shipment, ready for assembly on the vehicle, and loaded into the container, stacked next to it.

Due to the fact that the customer must have a certain qualification in order to for the equipment to be shipped disassembled, it is at Orakçı Makine's discretion that all the equipment or which part of the parts can be disassembled.

The TRUCK must be brought to a suitable position for container unloading after the shipping. Then, the unloading process is done carefully.

After the shipping, the staff who received the assembly training done by Orakçı Makine should perform the assembly (if it will be done) and then the first start-up.

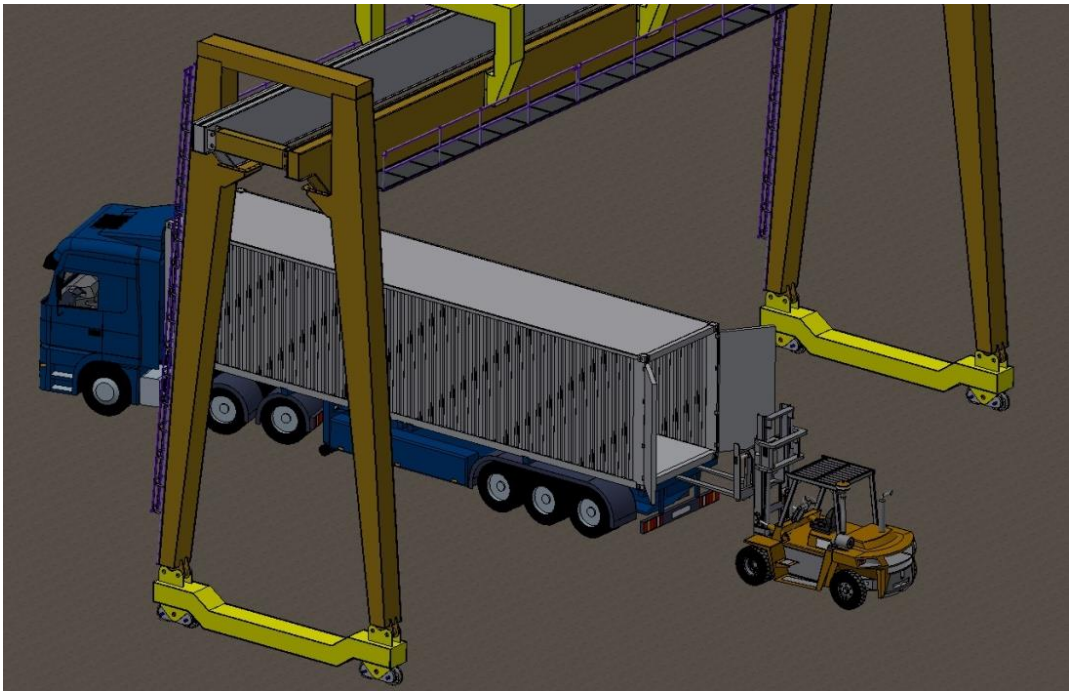


Figure 3.1: Product Shipment in Container

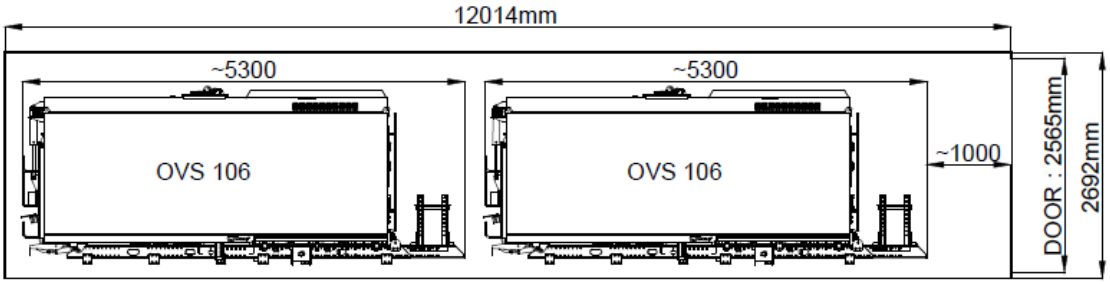


Figure 3.2: Product Placement in Container

3.2. On-Vehicle Assembly

The delivery of the equipment to the customer is made as on-vehicle assembled or by sending it in a container. If the equipment is mounted on the vehicle, all operations are carried out by Orakçı Makina and no other post-delivery assemblies are needed.

On-vehicle assembly is done as follows in general terms when the equipment is shipped in container.

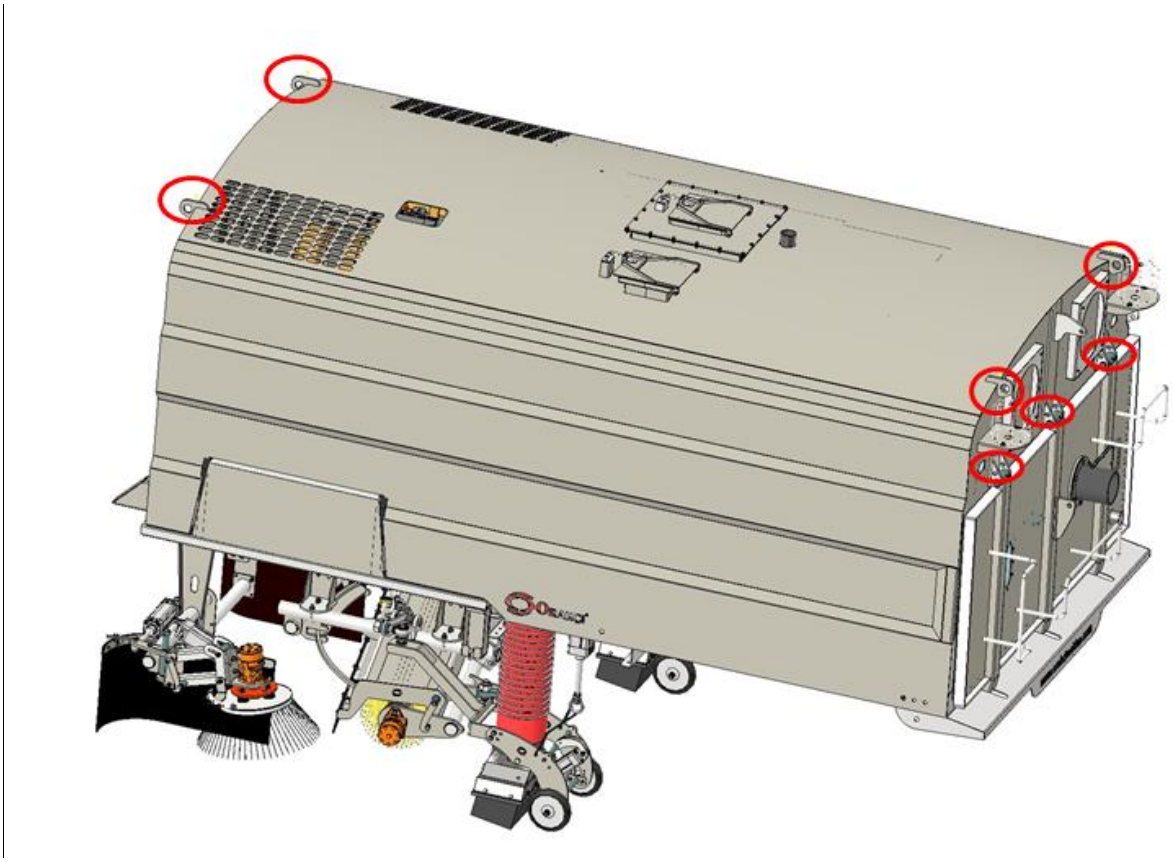


Figure 3.3: Elevation Points

First of all, they must be connected in a balanced way so that the center of gravity is between the ropes in order to carry the equipment. As shown in the top picture, the equipment must be connected from the carrying points on it. To be able to safely lift equipment, it must be lifted from appropriate points. If the equipment is to be

lifted, the 4 lifting lugs on the equipment have to be lifted or lifted from the holes on the tailgate hinges and dragged forward.

In order to load the equipment onto the vehicle, the equipment must be removed from the container with cranes and forklifts. Getting the vehicle ready for loading is as seen in Figures 3.4 and 3.5.

Figure 3.4: Removal of the Rear Bumper for Assembly

As shown in the figure, the rear bumper is removed for mounting on the vehicle. If necessary, the equipment chassis is shortened by cutting in accordance with the superstructure instructions of the relevant brand.

Figure 3.5: Vehicle Chassis

When placing the equipment on the vehicle, a crane suitable for the weight of the equipment should be used by holding it by the lifting points. Later, the equipment is placed on the chassis of the truck straight.

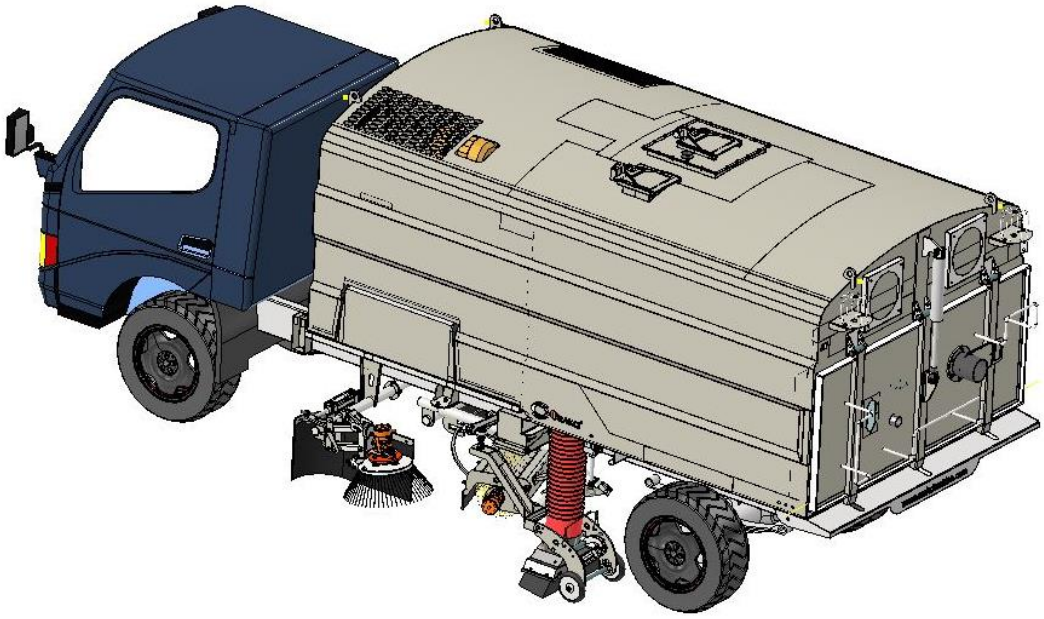


Figure 3.6: Placement of Equipment on Vehicle Chassis

3.2.1. Bracket Connection Assembly

The equipment is placed on the chassis of the truck. The vehicle chassis and the equipment chassis must be aligned with each other. In order to be able to connect the equipment mounted on the chassis with the vehicle, bracket connections must be made in accordance with the standards.

Since the superstructure standards vary according to the vehicle models, Orakçı Makina created its own standards as a result of the analysis. The Superstructure Bracket Table of Orakçı is shared in the booklet.

The mounting brackets are named according to their number as indicated below:

1) Type 1 Spring-loaded L Attachment
2) Type 2 Spring-loaded L Connection
3) 3) I Connection Brackets

After the equipment is properly placed on the vehicle chassis, it must first be mounted 30 mm above the vehicle chassis at a suitable point where the bracket can be mounted at a maximum distance of 300 mm from the equipment chassis with ‘I Connection Brackets’.

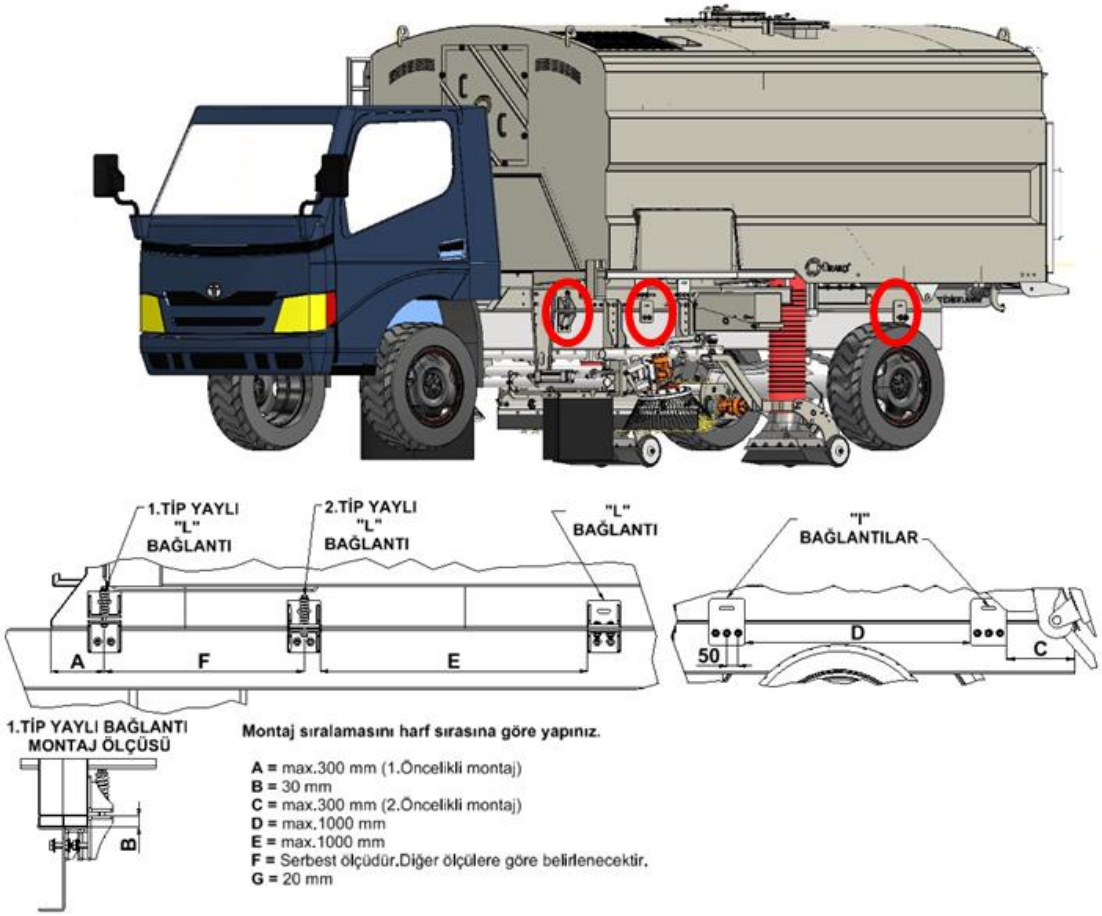


Figure 3.7: Bracket Connections

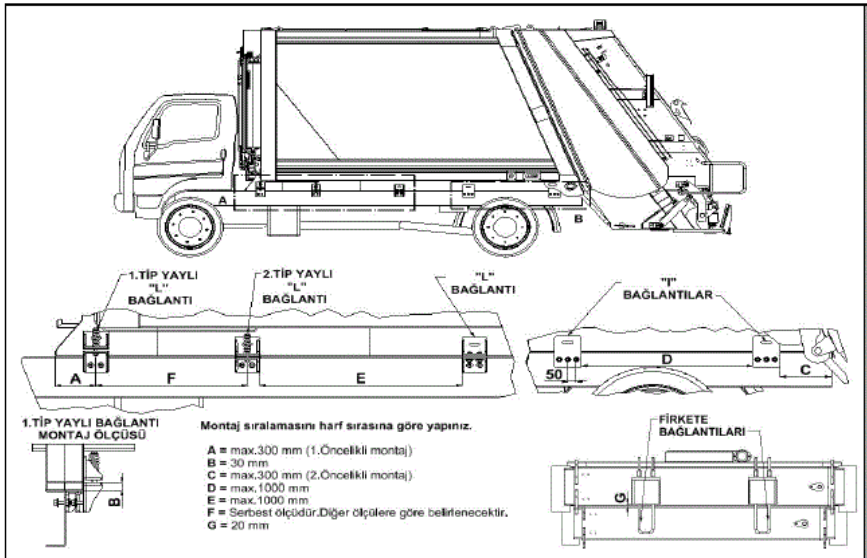
Then, the "I Connection" bracket is mounted at a maximum distance of 300 mm from the last point to ensure the linearity of the equipment on the vehicle chassis.

According to the length of the equipment, other "L Joint and I Joint" brackets are mounted according to the numbers determined in the Orakçı's Superstructure Bracket Table given below. It is mounted on the empty points of the vehicle with a maximum distance of 1000 mm between the L Connection and I Connection brackets.

Finally, "2. Type Spring L Connection" is mounted after the "1. Type Spring L Connection" bracket as a free dimension.

Below is the ‘Table 3.1 Superstructure Connection Table’ of Orakçı Makina.

ÜST YAPI BAĞLANTI BRAKETLERİ TABLOSU



TABLO-1

1.TİP YAYLI "L" BAĞLANTI PARÇA LİSTESİ TMOALLBRGSAA001	2.TİP YAYLI "L" BAĞLANTI PARÇA LİSTESİ TMOALLBRGSAA004	"L" BAĞLANTI PARÇA LİSTESİ TMOALLBRGSAA002	"T" BAĞLANTI PARÇA LİSTESİ TMOALLBRGSAA003	FİRKETE BAĞLANTI PARÇA LİSTESİ		
				1.TİP FİRKETE BAĞLANTI TMOALLBRMSAA006	2.TİP FİRKETE BAĞLANTI TMOALLBRMSAA007	3.TİP FİRKETE BAĞLANTI TMOALLBRMSAA008
100100320005 : 1 adet M16x140 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Yarım Passo	100100320005 : 1 adet M16x140 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Yarım Passo	100100310001 : 4 adet M14x50x1.5 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Tam Passo	100100310001 : 3 adet M14x50x1.5 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Tam Passo			
100200440002 : 1 adet M16 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	100200440002 : 1 adet M16 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	100200440001 : 4 adet M14 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	100200440001 : 3 adet M14 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	100201980001 : 2 adet Somunlar / Tekiylyeli Somun / M22 Yükseklik 33	100201980001 : 2 adet Somunlar / Tekiylyeli Somun / M22 Yükseklik 33	100201980001 : 2 adet Somunlar / Tekiylyeli Somun / M22 Yükseklik 33
101800890002 : 1 adet ØB mm x İç Çap: 19 mm x Dış Çap: 35 mm x Yay Serbest Boyu: 95 mm - Hatve: 11.87 - Sarım Yönü: Sağ / Yaylar / Basma Yayı	101800890002 : 1 adet ØB mm x İç Çap: 19 mm x Dış Çap: 35 mm x Yay Serbest Boyu: 95 mm - Hatve: 11.87 - Sarım Yönü: Sağ / Yaylar / Basma Yayı	TMOALLBRPSAA009 : 1 adet	TMOALLBRPSAA001 : 1 adet	TMOALLBRTSAA001 : 1 adet TMOALLBRPSAA013 : 1 adet	TMOALLBRTSAA002 : 1 adet TMOALLBRPSAA013 : 1 adet	TMOALLBRTSAA003 : 1 adet TMOALLBRPSAA013 : 1 adet
100100310001 : 2 adet M14x50x1.5 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Tam Passo	100100310001 : 2 adet M14x50x1.5 mm Cıvatalar / 10.9 Kalite / Galvaniz Kaplı / Altıköşe Flanşlı Tam Passo	*TMOALLBRMSAA001 : 1 adet **TMOALLBRPSAA005 : 1 adet **TMOALLBRPSAA004 : 2 adet				
100200440001 : 2 adet M14 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	100200440001 : 2 adet M14 Somunlar / 10 Kalite / Galvaniz Kaplı / Flanşlı	*TMOALLBRMSAA002 : 1 adet **TMOALLBRPSAA002 : 1 adet **TMOALLBRPSAA004 : 2 adet				
*TMOALLBRMSAA003 : 1 adet **TMOALLBRPSAA006 : 1 adet **TMOALLBRPSAA004 : 2 adet	*TMOALLBRMSAA003 : 1 adet **TMOALLBRPSAA006 : 1 adet **TMOALLBRPSAA004 : 2 adet					
*TMOALLBRMSAA004 : 1 adet **TMOALLBRPSAA008 : 1 adet **TMOALLBRPSAA005 : 2 adet	*TMOALLBRMSAA005 : 1 adet **TMOALLBRPSAA007 : 1 adet **TMOALLBRPSAA004 : 2 adet					

METRAJ	2400 mm ≤ x < 3500 mm	3500 mm ≤ x < 4700 mm	4700 mm ≤ x < 5000 mm	5000 mm ≤ x < 5700 mm	5700 mm ≤ x < 6350 mm	6350 mm ≤ x
TABLO-2 1.TİP YAYLI "L" BAĞLANTI	2 Adet	2 Adet	2 Adet	2 Adet	2 Adet	2 Adet
2.TİP YAYLI "L" BAĞLANTI	2 Adet	2 Adet	2 Adet	2 Adet	2 Adet	2 Adet
"L" BAĞLANTI	2 Adet	4 Adet	6 Adet	6 Adet	8 Adet	8 Adet (*2 m³ te, 1 Adet eklenecektir.)
"T" BAĞLANTI	4 Adet	4 Adet	4 Adet	4 Adet	4 Adet	4 Adet

EKİPMAN	OTP 122 - 142 - 162 - 183	OTP 203 - 224 - 255	OKG
TABLO-3 1.TİP FİRKETE BAĞLANTI	2 Adet	-	-
2.TİP FİRKETE BAĞLANTI	-	2 Adet	-
3.TİP FİRKETE BAĞLANTI	-	-	4 Adet

Tarih	27.12.2018	Hazırlayan	Onaylayan
Adı Soyadı		Arzu KALKANCILAR	Olcay ADAK
Rv.02			

TABLO-1: Bağlantı tiplerinin parça listesi bir adet braket montajına göre verilmiştir.
TABLO-2: Belirlenen braket bağlantı adetleri, bir ekipmanda kullanılacak toplam adetlerdir.
TABLO-3: Belirtilen ekipmanlar için, ek olarak kullanılacak firkete bağlantı adetleridir.

Table 3.2: Bracket Connection Table

Brackets connecting bolts are grade 10.9 M14x50x1,5. Connection nuts are of grade 10, which is described as M14x1,5 flanged chassis connection nut.

The following are the connection mounting lists of the brackets:

3.2.1.1. 1.Type L Spring-Loaded Connection Assembly

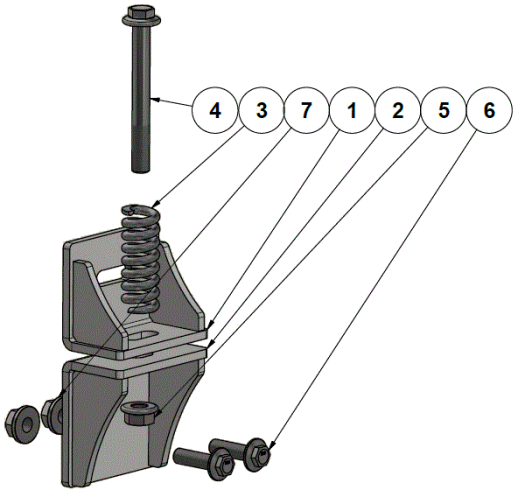


Figure 3.8: Type L Spring-Loaded Connection Assembly

Ref	Part Code	Description	St. / Opt.	Quantity
1	TMOALLBRMSAA003	L-joint top mount	Standard	1
2	TMOALLBRMSAA004	L link subassembly	Standard	1
3	101800890002	Ø8 mm x Inner diameter: 19 mm x Outer diameter: 35 mm x Spring free length 95 mm-Pitch 11.87-Winding direction: right / Springs / Push Spring	Standard	1
4	100100320005	M16x140 mm Bolts / Grade 10.9 / Galvanized Coated / Hexagonal Flanged Half-Pass	Standard	1
5	100200440002	M16 Nuts / Grade 10 / Galvanized / Flanged	Standard	1
6	100100310001	M14x50x1.5 mm Bolts / Grade 10.9 / Galvanized Coated / Full Pass with Hexagonal Flange	Standard	2
7	100200440001	M14 Nuts / Grade 10 / Galvanized / Flanged	Standard	2

Table 3.2 : 1.L Type Connection Bracket Connection Elements Table

3.2.1.2. 2.Type L Spring-Loaded Connection Assembly

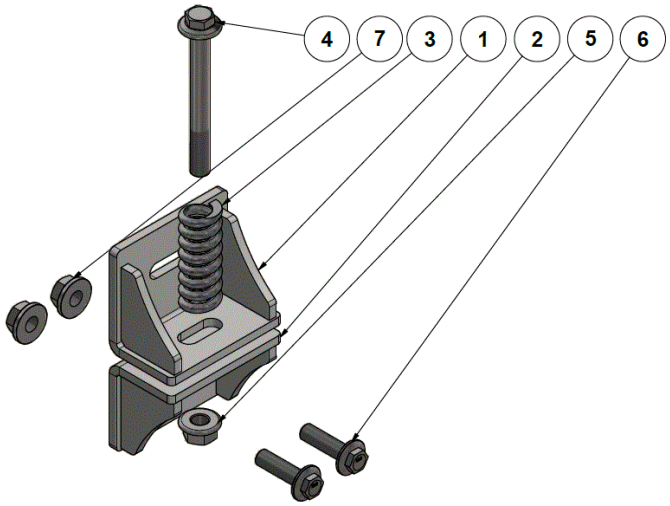


Figure 3.9 : Type Spring-loaded L Connection Assembly

Ref	Part Code	Description	St. / Opt.	Quantity
1	TMOALLBRMSAA003	L-joint top mount	Standard	1
2	TMOALLBRMSAA005	L link subassembly	Standard	1
3	101800890002	Ø8 mm x Inner diameter: 19 mm x Outer diameter: 35 mm x Spring free length 95 mm-Pitch 11.87-Winding direction: right / Springs / Push Spring	Standard	1
4	100100320005	M16x140 mm Bolts / Grade 10.9 / Galvanized Coated / Hexagonal Flanged Half-Pass	Standard	1
5	100200440002	M16 Nuts / Grade 10 / Galvanized / Flanged	Standard	1
6	100100310001	M14x50x1.5 mm Bolts / Grade 10.9 / Galvanized Coated / Full Pass with Hexagonal Flange	Standard	2
7	100200440001	M14 Nuts / Grade 10 / Galvanized / Flanged	Standard	2

Table 3.3 : 2.L Type Connection Bracket Connection Elements Table

3.2.1.3. L Connection Assembly

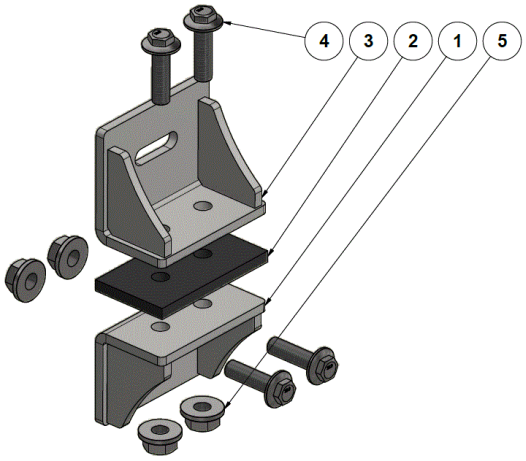


Figure 3.10 : L Connection Assembly

Ref	Part Code	Description	St. / Opt.	Quantity
1	TMOALLBRMSAA001	L link subassembly	Standard	1
2	TMOALLBRPSAA009	Bracket rubber wedge	Standard	1
3	TMOALLBRMSAA002	L-joint top mount	Standard	1
4	100100310001	M14x50x1.5 mm Bolts / Grade 10.9 / Galvanized Coated / Full Pass with Hexagonal Flange	Standard	4
5	100200440001	M14 Nuts / Grade 10 / Galvanized / Flanged	Standard	4

Table 3.4 : L Type Connection Bracket Elements Table

3.2.1.4. I Connection Assembly

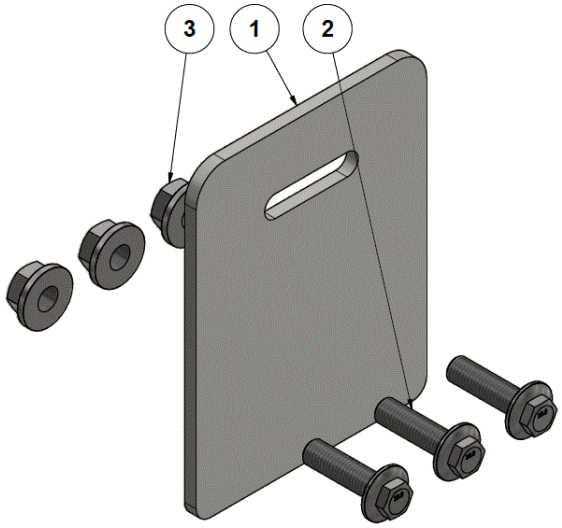


Figure 3.11: I Connection Assembly

Ref	Part Code	Description	St. / Opt.	Quantity
1	TMOALLBRPSAA001	L link subassembly	Standard	1
2	100100310001	M14x50x1.5 mm Bolts / Grade 10.9 / Galvanized Coated / Full Pass with Hexagonal Flange	Standard	3
3	100200440001	M14 Nuts / Grade 10 / Galvanized / Flanged	Standard	3

Table 3.5 : I Connection Bracket Elements Table

3.2.2. Making On-Vehicle Hydraulic and Water Connections

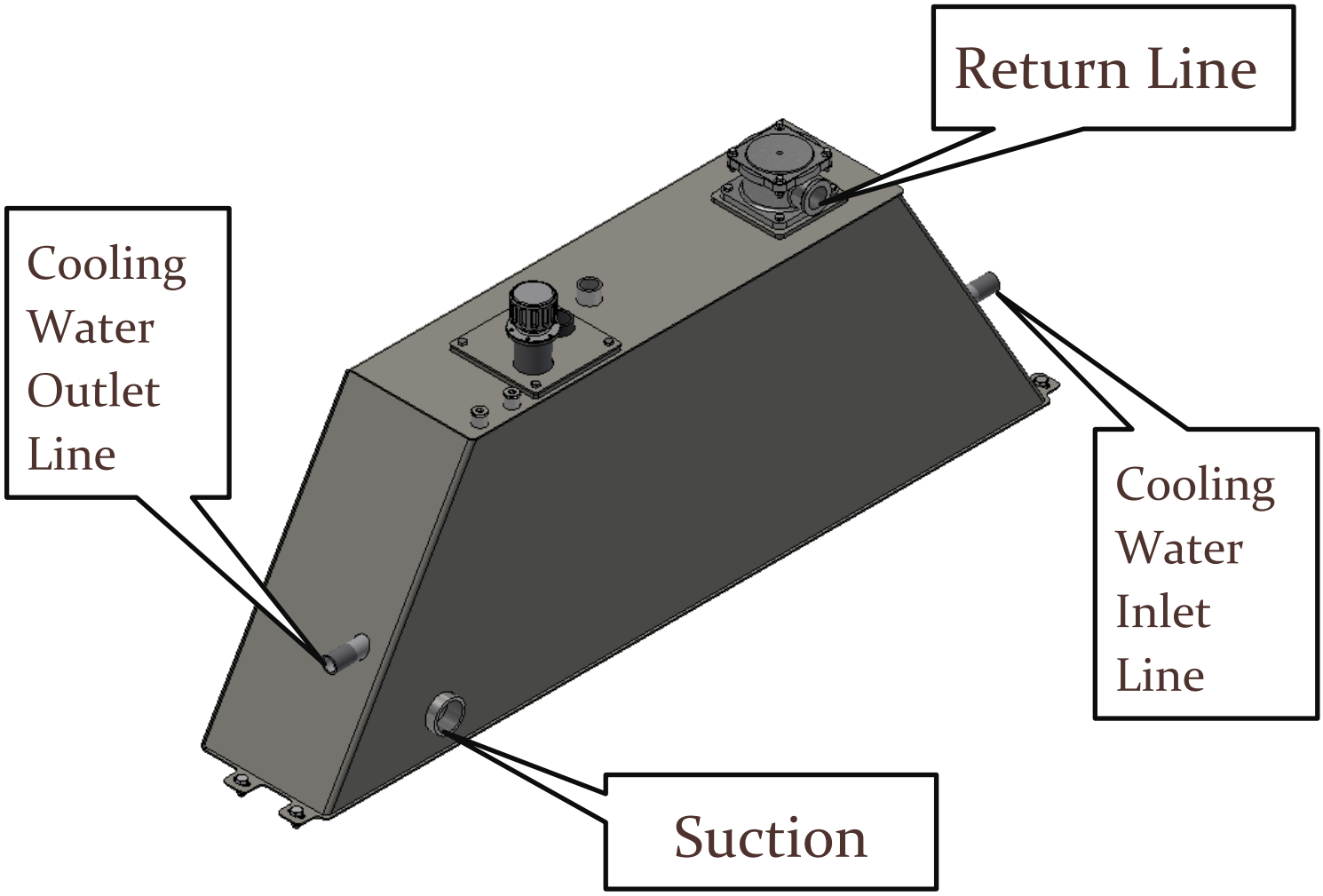


Figure 3.12 : Oil Tank Hydraulic Connection

The oil tank has suction and return lines as shown in Figure 3.12. From these lines, the return line collects the oil returning from the hydraulic elements to filter and cool down, while the suction line feeds the hydraulic pump oil. At the same time, the water coming out of the water tank enters the cooling water inlet line and leaves the outlet line, and goes to the water pump.

The water, which is cooled by leaving the water tank and passing through the oil tank, is pumped in the electric pump and distributed to the systems through the collector. These systems are irrigation system, bucket system and pressure manual washing system.

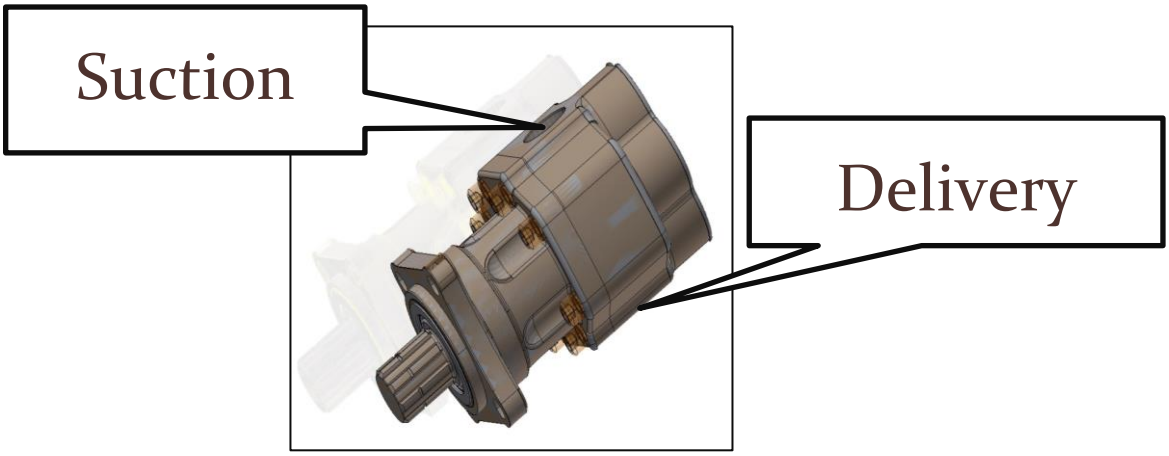


Figure 3.13 : PTO Pump Hydraulic Connections

Figure 3.13 shows the hydraulic pump connected to the PTO. The hydraulic oil taken from the oil tank by the suction line on this pump is activated while the vehicle is stationary, and by pressing it with the discharge line, it ensures the operation of the damper and tailgate mechanisms.

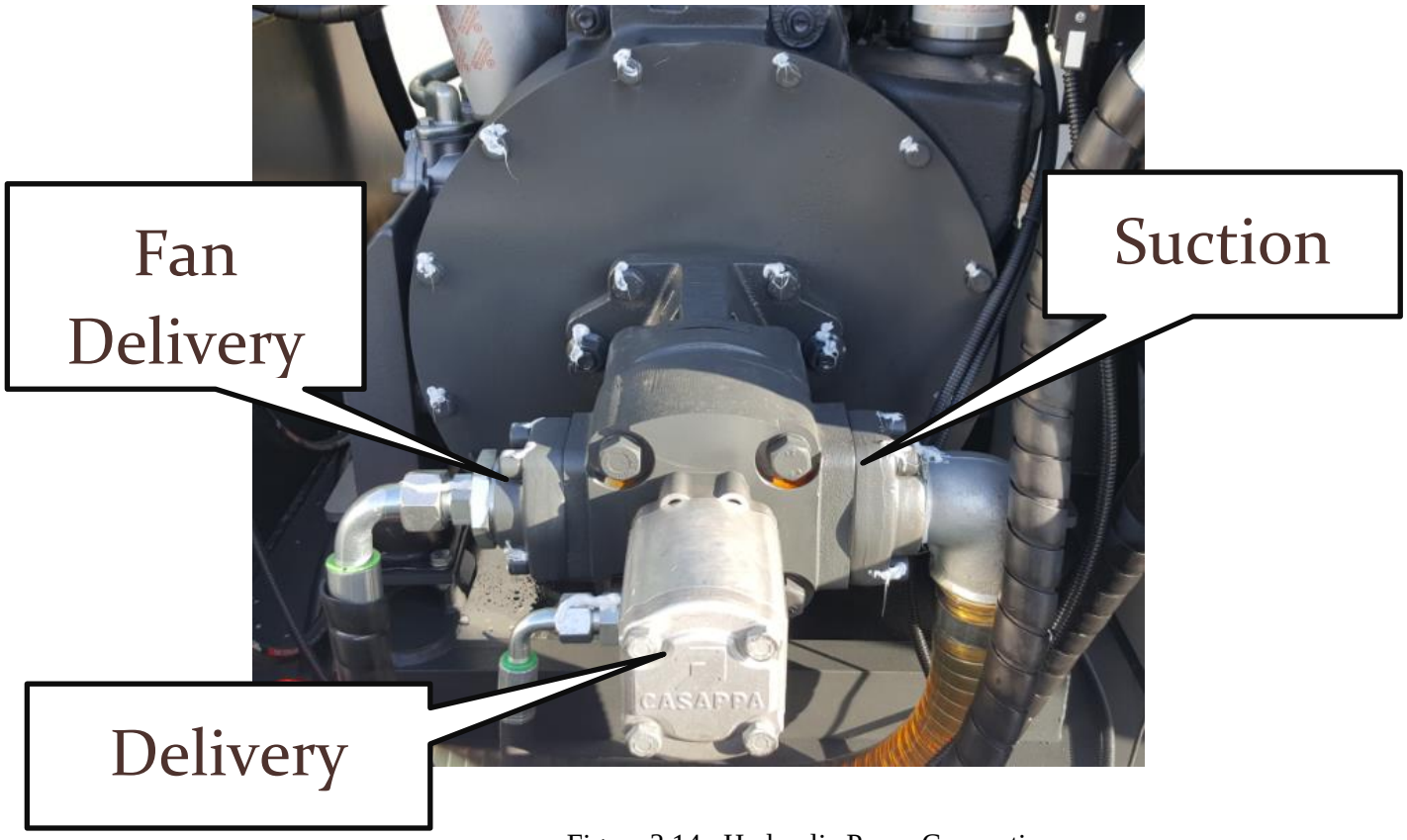


Figure 3.14 : Hydraulic Pump Connections

Figure 3.14 shows the hydraulic pump connected to the auxiliary engine. The suction line on this pump and the hydraulics it receives from the oil tank, regardless of the operation of the vehicle, transmit the drive and

provide the movement by pressing the fan from the fan discharge line and the brushes from the other discharge line, according to the commands coming from the touch control panel. This pump is the basic element of hydraulic power transmission.

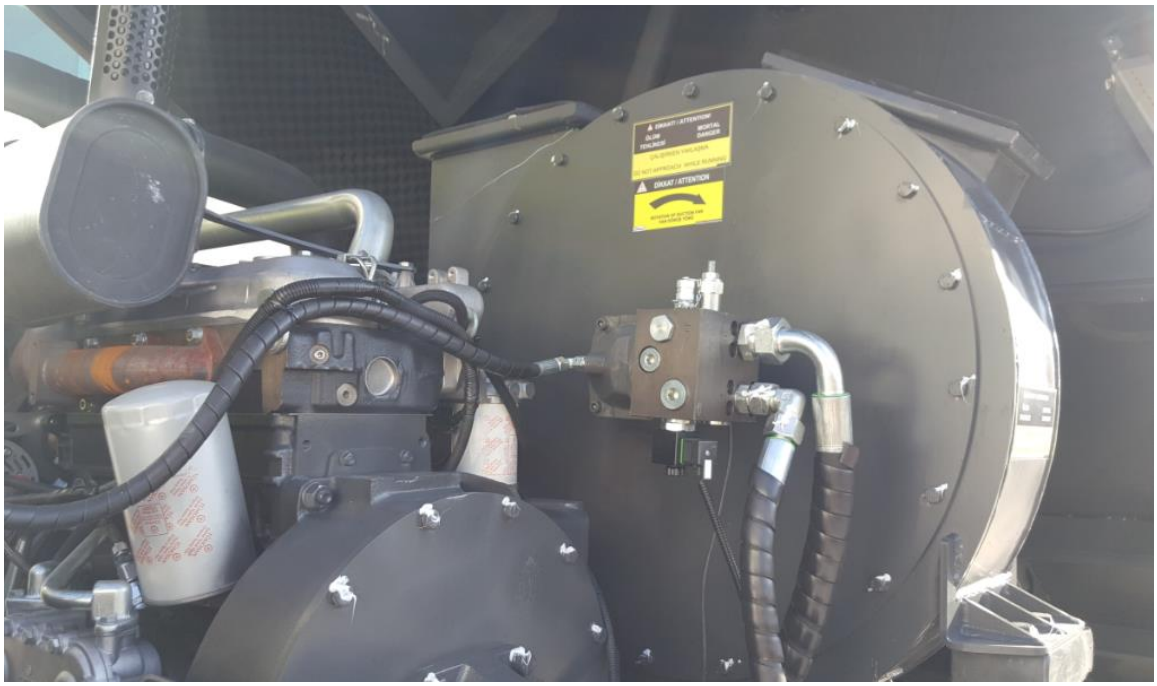


Figure 3.15: Suction Fan Hydraulic Connections

In Figure 3.15, the hydraulic connections of the suction fan are shown as an example of the hydraulic connections. The sequences of installation connections may vary. Connections must be made according to the hydraulic installation scheme in the booklet. If colored routing velcros are used, the color at the end of the hose must be connected with the same velcro. Figure 3.16 shows sample colors and sample application.

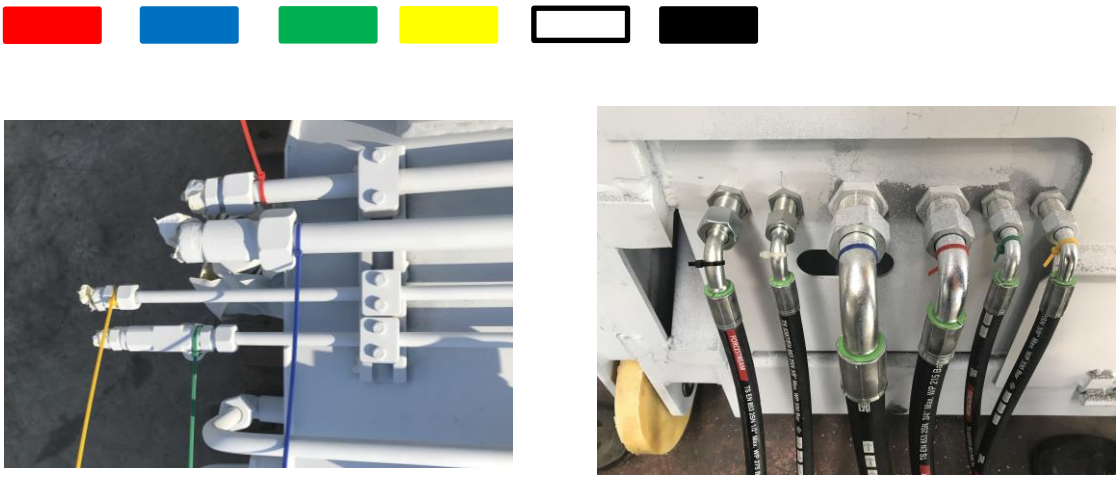


Figure 3.16: Colored Routing Velcro

3.2.3. Making Pneumatic Connections

Systems that are not driven by the hydraulic system of the equipment and generally linear moving systems are driven by the pneumatic system. These systems are; Bucket up-down, bucket lift-down, brush up-down, brush side opening-closing, damper lock mechanism opening-closing, bucket flap opening-closing and PTO activation/deactivation

Air must be taken from the vehicle for the pneumatic system to work. After passing through the air conditioner taken from the air tank of the vehicle, it reaches the pneumatic control panel seen in Figure 3.17. This control panel is inside the electrical panel compartment. This control panel operates the systems that are in need by transferring the commands coming from the touch control panel from the pneumatic systems. Pneumatic hoses coming out of the panel should be 4x6 bone hoses (hard).

Figure 3.17: Pneumatic Control Panel

3.2.4. Making Electricity-Electrical Connections

Electrical connections are made after the hydraulic and pneumatic installations of the equipment are completed. During the connections, it must be ensured that the cables are passed through the spiral sheath from the panel exit to the connection point in order to ensure their endurance.

The electrical cables in the panel are connected according to their function as specified in the project, the state after connection is seen in Figure 3.18. The required energy is provided by being brought to the panel from the battery again through the spiral cable sheath. After the electronic connection between the panel and the touch control panel is made, the program written by Orakçı Makina is sent to the system.

Lastly, the initial start-up is controlled via the touch screen. Then, after the first operation is verified by Orakçı Makina, the working is initiated.

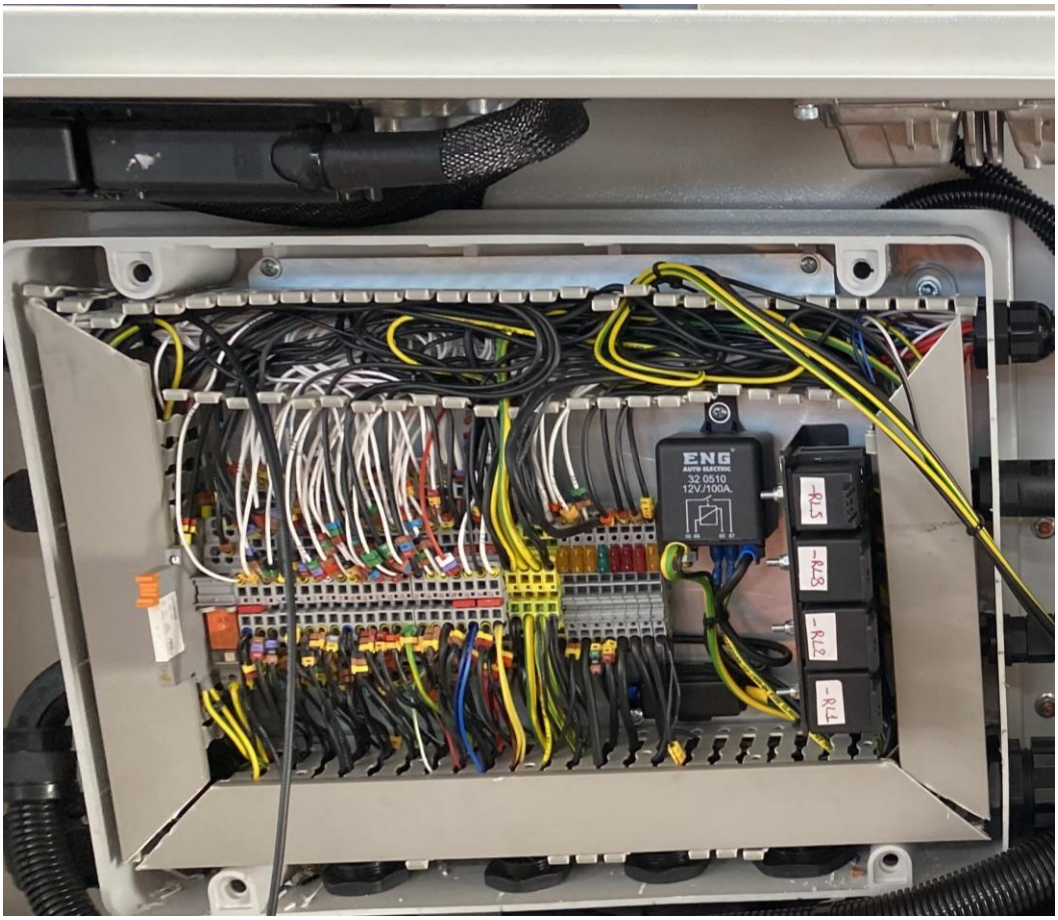
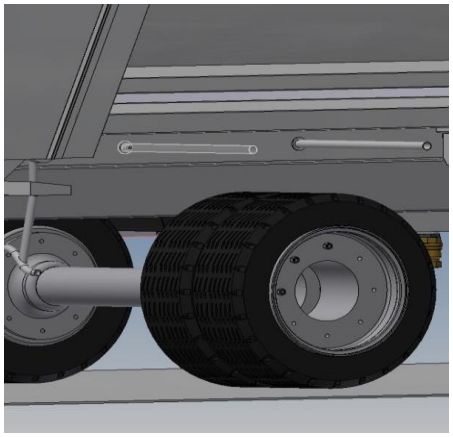


Figure 3.18: Electrical Panel

3.2.5 On-vehicle Mudguard Assembly

Figure 3.19: Mudguards

The mudguard connection elements which are assembled are shown in the figure. The mudguard fixation group is assembled to the mudguard. The bolts and nuts which are the elements of the connection group are fixed by opening holes on the mudguard.



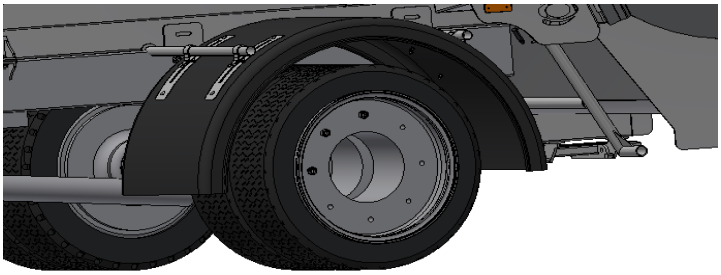


Figure 3.20: Mudguard Assembly

It is made by welding pipes to suitable points for mudguard assembly. Connection elements should be assembled as shown in the figure.

3.3. Delivery of the Equipment Mounted on the Vehicle

3.3.1. Packaging

Equipment is ready for use since they are mounted over the frame at Orakçı Makina. No kind of packaging is performed.

3.3.2. Transportation

No transportation is required since the equipment is mounted on the chassis. It can be taken to anywhere with a vehicle it was mounted on.

When the equipment is mounted on the chassis, the vehicle must be handled with care, as it will increase the vehicle's final center of gravity.

3.3.3 Stocking

If the equipment is to be parked without being put into use, it should be stored in dry places, and in places that can be protected from rain and direct sunlight.

3.4. Putting the Equipment Into Operation

When we deliver the vehicles to our customers in containers, the equipment will first be assembled with the applied training given by the Orakçı Makina training personnel.

Training for the practical usage of the equipment that is shipped as mounted on the vehicle is done at the factory or at the customer's place of delivery.

Equipment put into operation with methods other than the specified methods will be out of warranty.

4. USER MANUAL

4.1. Safety

4.1.1. Safety Warnings

Throughout this manual, safety warnings have been used to indicate danger, warning, and caution descriptions. Please closely follow these descriptions to minimize injuries and financial damages. Danger, warning, and caution terms indicate various degrees of injury and financial damage that can occur if the descriptions are not followed.

Warning signs that may appear in this manual or on the equipment and their meanings are listed below.

DANGER!

The "**DANGER**!" sign indicates a dangerous situation that may result in death or serious injury if not avoided.

CAUTION!

The "**CAUTION**!" sign indicates potentially dangerous situations that may result in death or serious injury if not avoided.

WARNING!

The "**WARNING**!" sign reminds the user of the necessary information required for the correct operation of the equipment.

Always use safe use and maintenance methods.

Orakçı Makine cannot estimate all potential dangers that may occur when the equipment is used or occur due to wrong use. Therefore, it must be known that the conditions that cannot be foreseen are not included in this user and maintenance guide. The user must take all safety measures with this awareness.

If the use and maintenance method is not implemented as recommended by Orakçı Makina, it must be made sure that the method used is safe for the user and everyone around. And it must be made sure that the use and maintenance method that you choose will not lead to damage to the equipment.

Orakçı Makina makes every effort to ensure that the equipment complies with the regulations in your country or region. However, if you haven't purchased your equipment from an authorized seller, it may not have the requirements of the regulations. It must be known that Orakçı Makina is not responsible for equipments obtained this way.

In addition, certain local activities or certain task areas may require special equipment that hasn't been provided yet. For more information and help, contact the nearest Orakçı Makine representative or authorized seller.

No responsibility can be accepted for typographical errors or omissions in the booklet. If you encounter a similar situation, contact Orakçı Makina.

4.1.2. Safety Warning Labels and Their Area of Use

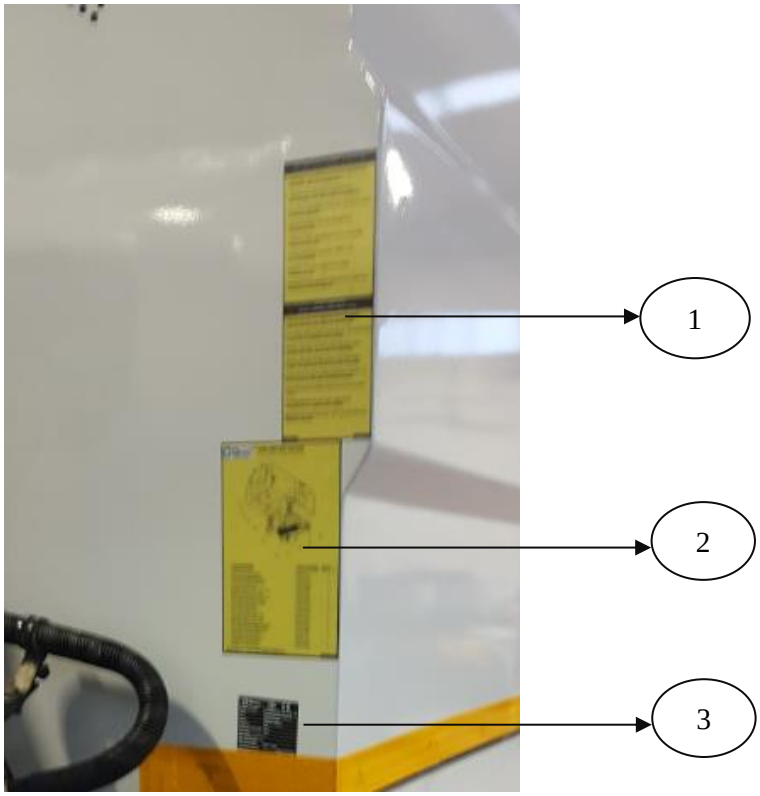
4.1.2.1 Definitions

All safety signs on the equipment are shown here. Read and understand them completely. These signs contain important information for safe use and maintenance. Follow the directions on the safety signs carefully.

It is very important that all safety signs are located where they are shown on the machine. If any of the signs are missing, damaged or impaired, purchase a spare one from ORAKÇI authorized seller and mount them in their correct place.

NOTE: Safety sign examples in this section have been provided with part numbers in order to help you and your seller find the right spare part.

4.1.2.2 Area of Use



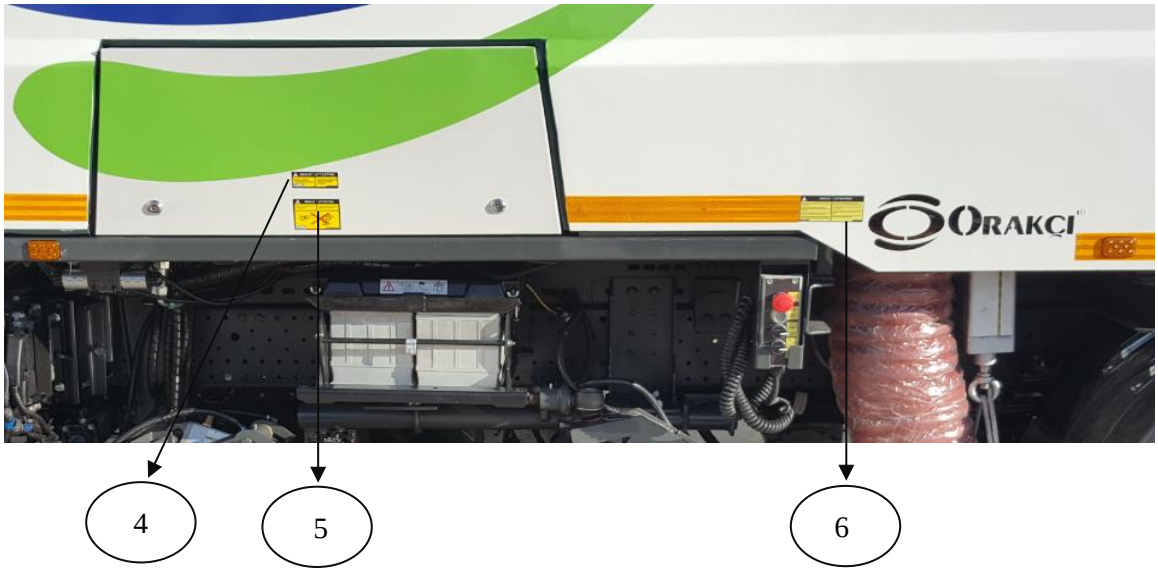


Figure 4.1 : Display of Usage Places of Labels-1

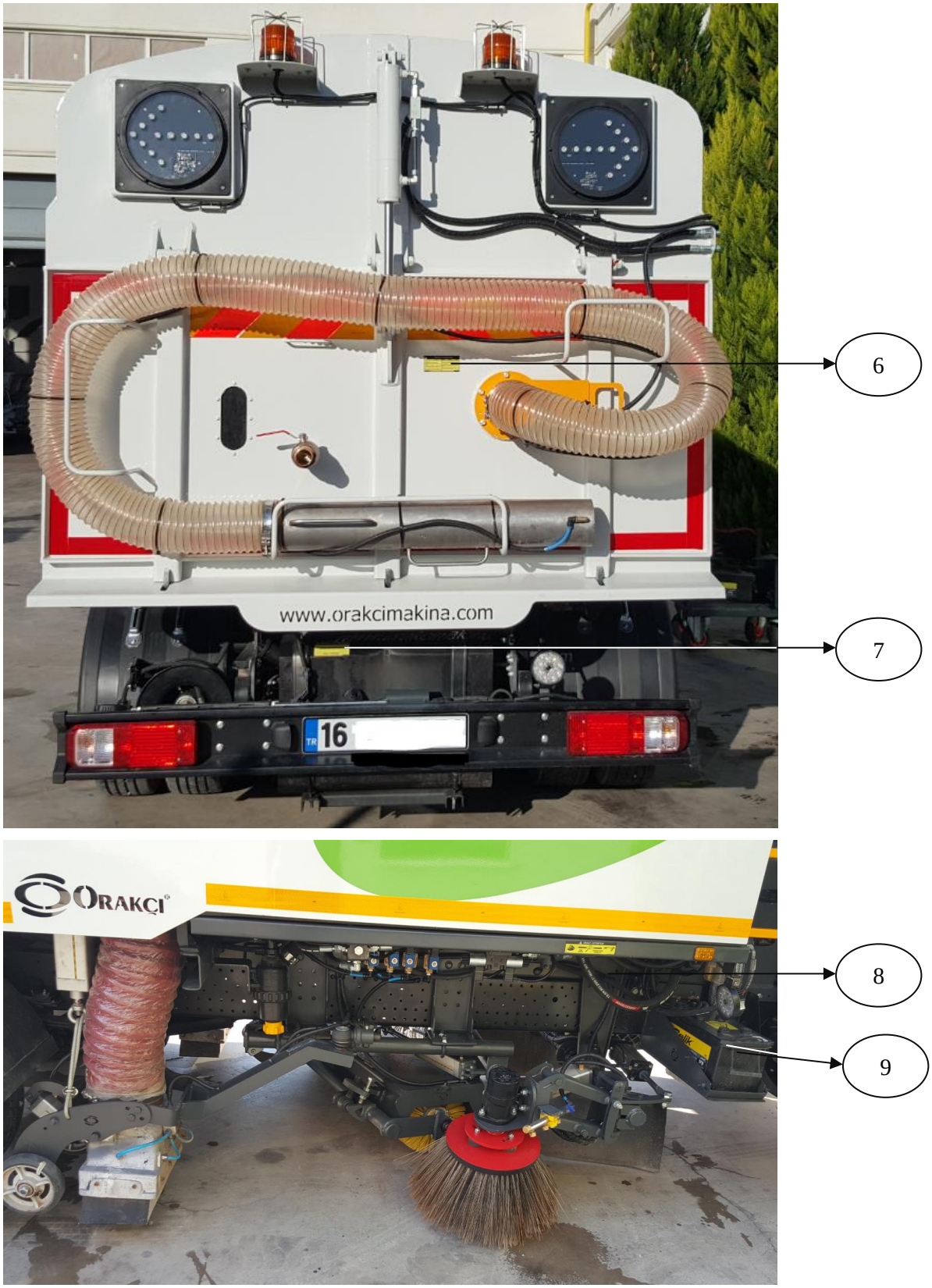


Figure 4.2 : Display of Usage Places of Labels-2

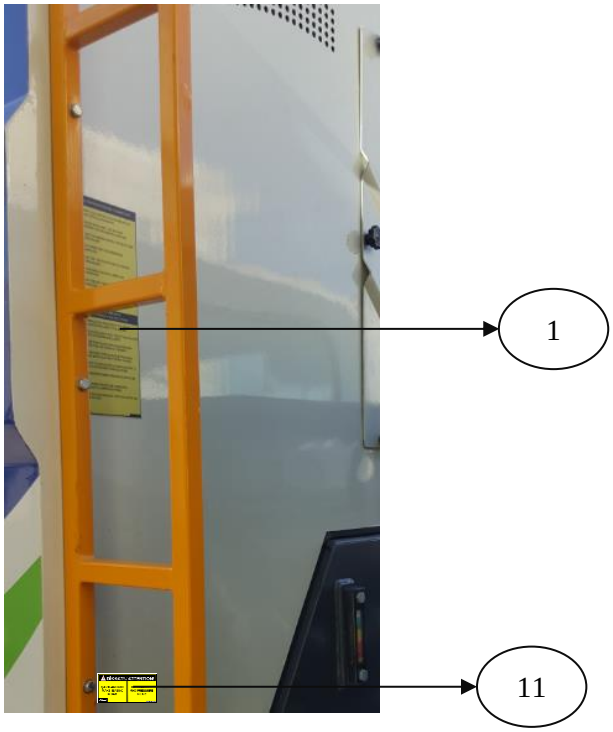


Figure 4.3 : Display of Usage Places of Labels-3

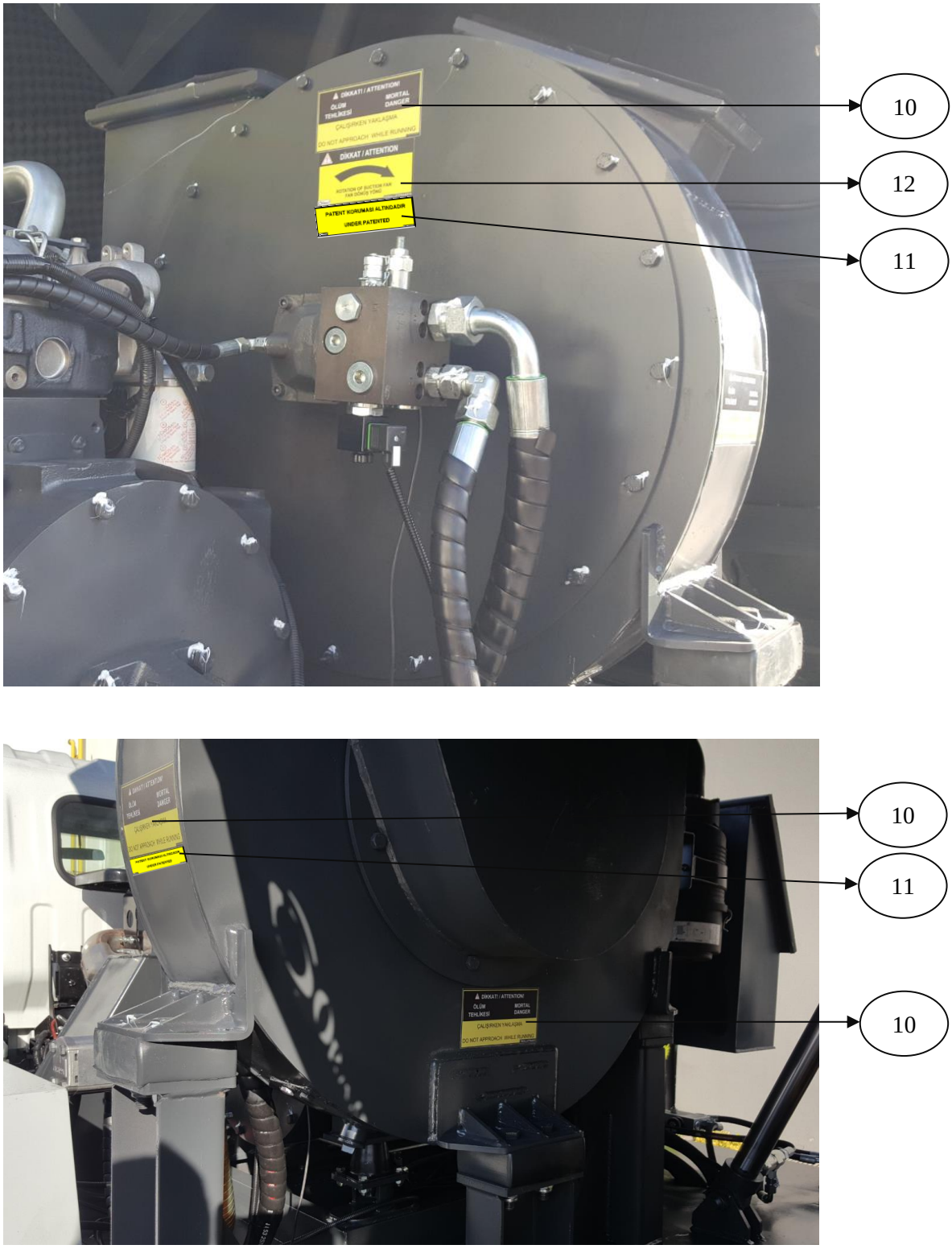


Figure 4.4 : Display of Usage Places of Labels-4

Label List:

Ref.	Part Code	Description	Optional	Quan
1	OVSALLETPSAA004	Road Sweeper Maintenance Instructions	S	2
2	OVSALLETPSAA012	Lubrication Label	S	1
3	TMOALLETPSAA004	History Label	S	1
4	TMOALLETPSAA021	Cover Warning Label	S	1
5	TMOALLETPSAA020	Pressure Water Warning Label	S	1
6	OVSALLETPSAA003	General Warning Label	S	2
7	OVSALLETPSAA005	Fuel Warning Label	S	1
8	OVSALLETPSAA013	3-Way Valve Adjusting Label	O	1
9	TMOALLETPSAA016	Electrical Warning Label	S	1
10	OVSALLETPSAA005	Danger of Death Label	S	3
11	OVSALLETPSAA015	Patent Label	S	2
12	OVSALLETPSAA014	Fan Rotation Direction Label	S	1
13	OVSALLETPSAA001	4 Wired Control Label	S	1

Table 4.1: Label Table

4.2. Safety Measures

Operator Safety:

Before starting to use the equipment, read the User Manual and make the necessary preparations in a safe manner. Be aware of the locations and meanings of safety signs on the equipment. Report missing or illegible signs and have them replaced.

Have the road sweeper used by an authorized and trained operator. In order to use the equipment safely, follow the items written below.

- Do not use the equipment when you are extremely tired.
- Do not use the equipment if you are taking sedative medications.
- Do not use the equipment while under the influence of alcohol or drugs.
- Wear safe clothes. Tight clothing, loose or baggy clothing can hook onto mechanical areas or control equipment.
- It is recommended that you wear protective clothing as required by the job or conditions, as stated in the following sub-items.
    - Gloves
    - Steel toe shoes
- Do not wear jewelry that can hook onto mechanical areas and control equipment or cause a fire by causing a short circuit in case of contact with electrical parts.

Safety Precautions Before Operation:

- Do not operate the equipment if it doesn't have enough hydraulic oil in it.
- Please note the location and usage methods of safety equipment given below.
    - Fire extinguishers
    - First aid kits
    - Phone Numbers to call in case of emergency
- Examine the state of safety elements and make sure that they are corrected in case of non-compliance.
    - Missing or illegible safety signs
    - The vehicle's rearview mirror is missing or broken
    - Warning lamps or signals in the equipment are broken or not working
    - Reflectors are missing or broken.

- Make sure the safety devices are working and in the right places.

    - Reverse gear (Audio warning): Ready
    - Parking brake: Pulled
    - Emergency Stop audio warning: Ready
    - Driver warning horn: Ready

Safety Precautions To Be Taken During Use:

Area Safety:

- Keep the people around away from the brush group during operation.
- Do not operate the equipment under road conditions that may cause the vehicle to skid.
- Turn off the irrigation system in road conditions that may cause the vehicle to slide.
- The operating temperature of the equipment is between -25 °C and 45 °C.
- Keep the fuel tank away from areas exposed to fire and sparks.
- When working in confined spaces:

    - Check that there is sufficient clearance for buildings and sidewalks.
    - Do not go on the sidewalk and operate the equipment.

NOTE : Do not lift the tailgate except at maintenance stations and waste disposal areas.

Safety measures to be taken during normal operation:

- The rear side can be seen limitedly. When going in the reverse direction, one should use the cameras.
- Clutch must be used to activate and deactivate the PTO.
- When the PTO in the vehicle is activated, never move the vehicle. Moving the vehicle while the PTO is activated will cause serious damage to the vehicle.
- The equipment is only for sweeping the wastes on the roads. It can cause serious problems in the equipment when used for other purposes. Please note that the warranty is for manufacturing defects and this will not be covered by the warranty.
- Do not try to load more waste than the body can get.

- Be aware that using the equipment for purposes other than those specified in the operation and maintenance manual may cause hazards not specified in the manual. Follow the written instructions.

- During the road sweeping process with the equipment:

    - Drive as fast as the conditions and security conditions allow and do not exceed 20km/s.
    - Know and obey local regulations for rotating warning lights and illumination. Turn on the warning lamps throughout the operation.
    - Avoid sudden braking, sudden starting and sudden maneuvers. These movements will be dangerous when the tank is full of water.

- While driving while not sweeping the road with the equipment:

    - Drive as fast as conditions and safety conditions allow, and do not exceed the maximum speed of the vehicle as defined by law.
    - If it is to be driven at low speeds while loaded, the warning and flashing lamps must be on.
    - Avoid sudden braking, sudden starting and sudden maneuvers. These movements will be dangerous when the tank is full of water.

Safety measures to be taken while parking:

- Stop the equipment on a flat surface.

- Set the parking brake.

- To prevent unauthorized use;

    - Take the ignition key.
    - Lock the master key and take the key with you.
    - Make sure that all doors and windows are closed and then lock them.
    - Examine the equipment and report the repairs you deem necessary to the authorized company.

4.3. Safe Maintenance

If changes are made in the hydraulic system other than the pressure settings specified in the user manual, the vehicle will be out of warranty.

Safety measures to be taken before maintenance operations:

Perform maintenance and repairs only if you have been trained for it. Follow the instructions and information given in the use and maintenance manuals.

- Wear safe clothing to carry out maintenance work.

    - Wear tight clothes. (Loose and baggy clothing are dangerous and prohibited to work in.)
    - Wear protective clothing as required by the job or conditions, as stated in the following sub-items.

        - Gloves

- Steel toe shoes
- Goggles
- Face Mask

- Do not wear jewelry that can hook onto mechanical areas and control equipment or cause a fire by causing a short circuit in case of contact with electrical parts.

- When the body is lifted with the damper, immediately insert the stop for safety. Do not go under the body before placing the stop

- Before performing maintenance;

  - Park the vehicle on level ground.
  - Set the parking brake.
  - Stop the engine and the auxiliary engine.
  - Chock the wheels.
  - Take the vehicle key from the ignition.

- Never repair parts in which pressurized hydraulic fluid passes through. Release all compacted hydraulic pressure as follows:
  - Stop the engine.
  - Allow the hydraulic pressure to be reset by pressing the relevant control levers.

- Hang the "DO NOT START" or "DO NOT USE" card on the ignition switch or steering wheel, indicating not to be started.

- Use stable supports when working under any mechanical zone. Do not rely on the hydraulic cylinders.

- Do not stand on the wheels. Use reliable and durable work platforms.

- Drain all hydraulic oil into suitable containers. Keep the containers in well-ventilated places, where unauthorized people cannot enter.

- Hot oils can cause burns. Before performing maintenance, verify that the components have cooled to a reliable degree indications on top and on the screen. Then discharge the oil.

- Before maintenance, clean the equipment to be completely free of waste.

- To prevent environmental pollution, dispose of the used oil in accordance with official legislation.

- Keep the people around away from the maintenance area.

- Carry out the periodic maintenance of the vehicle and the equipment at specified intervals. For periodic maintenance of the equipment, see the list of maintenance instructions.

4.3.1 Warnings

ALWAYS / NEVER

ALWAYS Check if the machine maintenance is done on time!

ALWAYS Check if machine operations are correct!

ALWAYS If there's no traction, check the bucket flap!

ALWAYS Have a second person with you for emergencies in case of a problem or during maintenance!

ALWAYS With the chassis lifted with the damper, open the stop and insert it!

ALWAYS Keep the bucket and inside of the hoses clean before operation!

NEVER Do not enter the engine compartment and waste reservoir while the equipment is running!

NEVER Stay away from the brushes while the vehicle is running!

NEVER Do not let unauthorized people do the operation controls!

NEVER Do not walk or work under the body without a stopper when it is at its top point!

NEVER Do not start the machine in case of wrong mechanism adjustment and damage!

NEVER Do not load waste with the water system open above the rear window level!

4.4 Instructions for Use

Equipment manufactured in accordance with the specifications is not suitable for the following conditions:

- Temperatures above +40°C and below -25°C,
- Tropical environments,
- Winds whose speed exceeds 75km/h,
- Contaminating environment,
- Corrosive environment,

- Potentially explosive environment,
- Sweeping roads with wastes that may cause dangerous situations (For ex. hot wastes, acids, and bases, radioactive substances, contaminated wastes, breakable loads, explosives)
- Working on ships

4.5 Terms of Use

Before using the Vacuumed Road Sweeper, the usage, maintenance, and spare parts catalogs should be examined. Vacuumed Road Sweeper has a system that is simple to use. Vacuumed Road Sweeper consists of:

1. Waste Reservoir
2. Brush and Suction Bucket System
3. Engine Compartment
4. Water Tank and Irrigation System
5. Hydraulic System
6. Pressure Washing Pistolet
7. Control System

These six systems are controlled by the control system specified in the last article, which consists of the electrical and pneumatic systems working together. The commands of these two systems from the touch control panel first enter the electrical panel and output the required output, if necessary, it opens a valve in the pneumatic collector. The valve opens or closes by transmitting its command to the system with air in pneumatic transmission, and with current in electrical transmission.

In the system, the tailgate of the waste reservoir, the brush and bucket system and the damper piston are moved by directional control valves. In addition to this valve, there are safety valves at necessary points. These hydraulic valves are connected to a control and adjustment valve. They have been set by our company and must not be changed for the proper operation of the system.

The oil level and the possibility of oil leakages must be checked before the vehicle starts. Before the damper is lifted and the pressure washer gun is used, it is operated by pressing the PTO button and the clutch on the touch control panel in the driver's cabin. The clutch is released slowly. Thus, P.T.O pump connection is ensured.

Maximum attention should be paid to the following matters during use:

- The PTO must be disengaged before the vehicle moves.
- During the operation of the brushes, they should not be approached.
- In case of a sudden change in sound and smoke in the auxiliary engine, if it did not stop, the fan should be turned off, after one minute the auxiliary engine should be closed and should not be run again without performing maintenance.
- After lifting the damper, no operation should be done under the chassis without lowering the support.
- During the opening and closing of the tailgate, there should be no person behind it.

After emptying, the tailgate is removed and the waste reservoir is cleaned. (A solid support must be attached under the tailgate during this process) After this process, the tailgate is lowered, the vehicle is cleaned and washed.

The tightness of the body connections of the vacuumed road sweeper should be checked during the first operating months and they should be tightened if necessary.

When the hydraulic system is operating, the PTO pump outlet in the vehicle must be 1000 d/min.

With the tailgate open, the vehicle should not be moved.

4.6. The Use of Vacuumed Road Sweeper

The use of the Vacuumed Road Sweeper will be explained with the operation cycle, in which the waste reservoir is emptied again from its completely empty state.

4.6.1. Road Sweeping with the Vacuumed Road Sweeper

The Vacuum Road Sweeper goes to the sweeping area without turning on any of its systems, except for its flashing lights. Then it follows the steps below in order:

1. Presses the button that turns the auxiliary engine on.
2. Activates the fan.
3. The side (left or right) for the sweeping operation is selected.
4. If the weather is rainy, the irrigation system is turned off.
5. The sweeping operation is done at a speed of 0 – 20 km/h, by using the cameras and checking the perimeter security.
6. During the sweeping process on dry floors, attention should be paid to the water level in the water tank and after seeing the "fill the water tank" warning sign, the sweeping process should be interrupted until the water tank is filled again.
7. If the waste reservoir is full (water is at the sight glass level), sweeping should be completed.
8. To finish the sweeping process, the brush group and irrigation system are turned off by pressing the main menu button.

4.6.2. Emptying the Vacuumed Road Sweeper's Waste Reservoir

Vacuumed Road Sweeper flashing lights and fan go to the waste disposal area in open conditioned determined by the civil administration. Then it follows the steps below in order:

1. The vehicle is parked at the location of unloading process.
2. First, the fan is turned off and the auxiliary engine is turned off as soon as the fan speed drops below 100 rpm.
3. It is activated by pressing the PTO on/off button by engaging the Clutch.
4. Damper is lifted with cable control.
5. Tailgate is opened.
6. The pressure washing gun is activated by turning the handle of the gun and the waste reservoir is washed.
7. By turning the handle again, the damper is activated.
8. With the cable control, the damper is lowered first and then the tailgate is closed.
9. It is deactivated by pressing the PTO on/off button by engaging the Clutch.

When these processes are completed, the equipment is ready for road sweeping again.

4.7. Console and Control Panel

Buttons and button boxes are standard under normal conditions, and optionally, it can vary according to the special requests of the customer, according to the country-specific standards.

4.7.1. Touch Screen Panel

The touch control panel is located inside the cabin and is able perform all functions.

Figure 4.5: Touch Control Panel

The keys on this panel perform the following functions, respectively, as shown in Figure 4.5.

1. Open the right brush,
2. Lower the damper,
3. Open the tailgate,
4. Lift the damper,
5. Unlock/lock the damper,
6. Activate/deactivate the PTO,
7. Open the left brush,
8. Delete the fault message
9. Turn on/off the flashing lights,
10. Activate/deactive the fan,
11. Turn on/off the auxiliary engine.

Apart from these, battery voltage, hydraulic oil level and temperature, water level, auxiliary engine operating pressure and temperature, fan rotation speed and engine operating speed can be viewed on the same screen. In addition, in case of a possible error, the operator is guided by a warning given on the bottom line. During the operation, the camera of the selected side and the rear camera are active. For operational safety, the rear camera also works when reverse gear is engaged.

4.7.2. Wired 4-Way Controller

The wired 4-way controller is located on the left wall of the body and has a spiral cable long enough to perform all functions while monitoring.

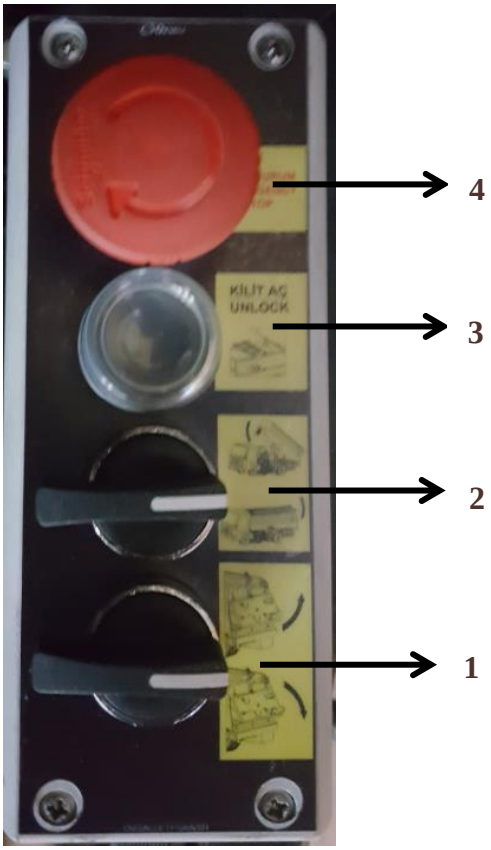


Figure 4.6 : The 4-Control Box

The keys on this panel perform the following functions, respectively, as shown in Figure 4.6.

1. When the selector button is turned down, close the tailgate,
   When the selector button is turned up, open the tailgate,
2. When the selector button is turned down, lift the damper,
   When the selector button is turned down, lower the damper,
3. Unlock/lock the damper,
4. Emergency stop button

5. TROUBLESHOOTING AND MAINTENANCE

Take precautions against all possible hazards first before starting the maintenance. The maintenance and repair of equipment must be performed only by a well-trained or experienced staff.

5.1.Lubrication and Maintenance

Please use hydraulic oil that is anti-foam, rust, and anti-oxidation and includes an anti-wear additive.

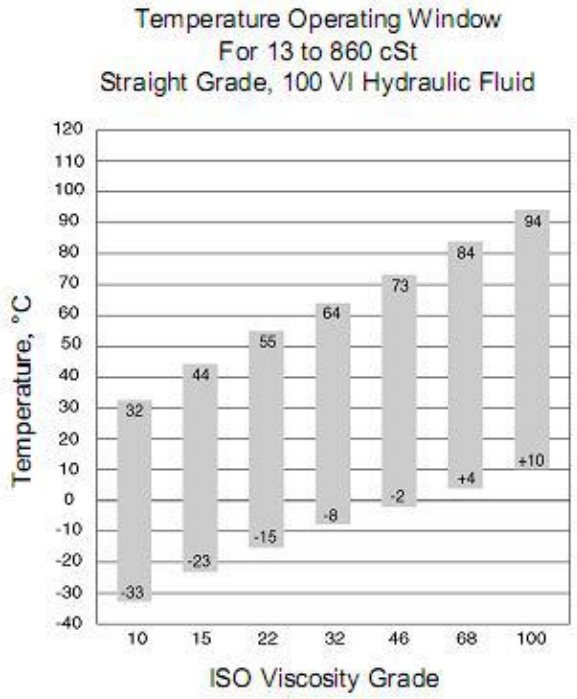


Figure 5.1: Hydraulic Oil Scheme

A suitable oil must be selected according to the operating temperatures specified in Figure 5.1. Frequently used hydraulic oil types are ISO46/ ISO68.

Oil no. ISO32 may be used in areas with colder and low operating temperatures. (Viscosity: 68 for hot countries, 32 for cold countries, and 46 for Turkey.)

Grease lubrication is performed at points subject to wear on equipment. Lubrication areas are shown on the label with the code OVSALLETPSAA012. Follow the lubrication periods given in the maintenance chart.

The hydraulic oil specified in the user manual should be used in the system. Hydraulic oil brands are given in the table 5.1.

Engine oil, diesel filter, air filter and oil filter are the components of the auxiliary engine.

Petrol Ofisi	Hydro Oil hd 68	Hydro Oil HD 46	Hydro Oil HD 32
BP	Energol HLP 68	Energol HLP 46	Energol hlp 32
Shell	Tellus S2 M 68	Tellus S2 M 46	Tellus S2 M 32
Castrol	Hyspin-AWS 68	Hyspin-AWS 46	Hyspin-AWS 32
Total	Azolla ZS 68	Azolla ZS 46	Azolla ZS 32

Table 5.1: Recommended Hydraulic Oil Brands

The oil in the oil tank must be checked **EVERY DAY**. While the cylinders are closed, the oil level must be on the upper part of the indicator. Especially the hydraulic system and auxiliary engine of the equipment should be visually checked. In the event that a problem is observed, the equipment should not be operated without maintenance and repair.

20 HOURS AFTER THE FIRST OPERATION, the engine oil should be changed with the recommended engine oil in Table 5.2, and the fuel filter, air filter, oil filter, hydraulic suction, and return filters must be replaced.

50 HOURS AFTER THE FIRST OPERATION, the tightness of all hydraulic, pneumatic, nut, and bolt connections should be checked.

AFTER EVERY 50 HOURS OF OPERATION, the air filter (must be dismantled) and the radiator should be cleaned by compressed air blow.

AFTER EVERY 250 HOURS OF OPERATION (200 HOURS FOR TÜMOSAN) or AFTER 1 YEAR (whichever comes first), the engine oil should be changed with the recommended engine oil in Table 5.2, and the fuel filter, air filter, and oil filter must be replaced. After the maintenance is completed, the maintenance warning lamp should be turned off from the touch control panel.

AFTER EVERY 500 HOURS OF OPERATION, the hydraulic rotation filter should be replaced.

AFTER EVERY 1000 HOURS OF OPERATION or 1 YEAR (whichever comes first), hydraulic oil should be changed with the hydraulic oil recommended in Table 5.1, and all hydraulic filters should be replaced.

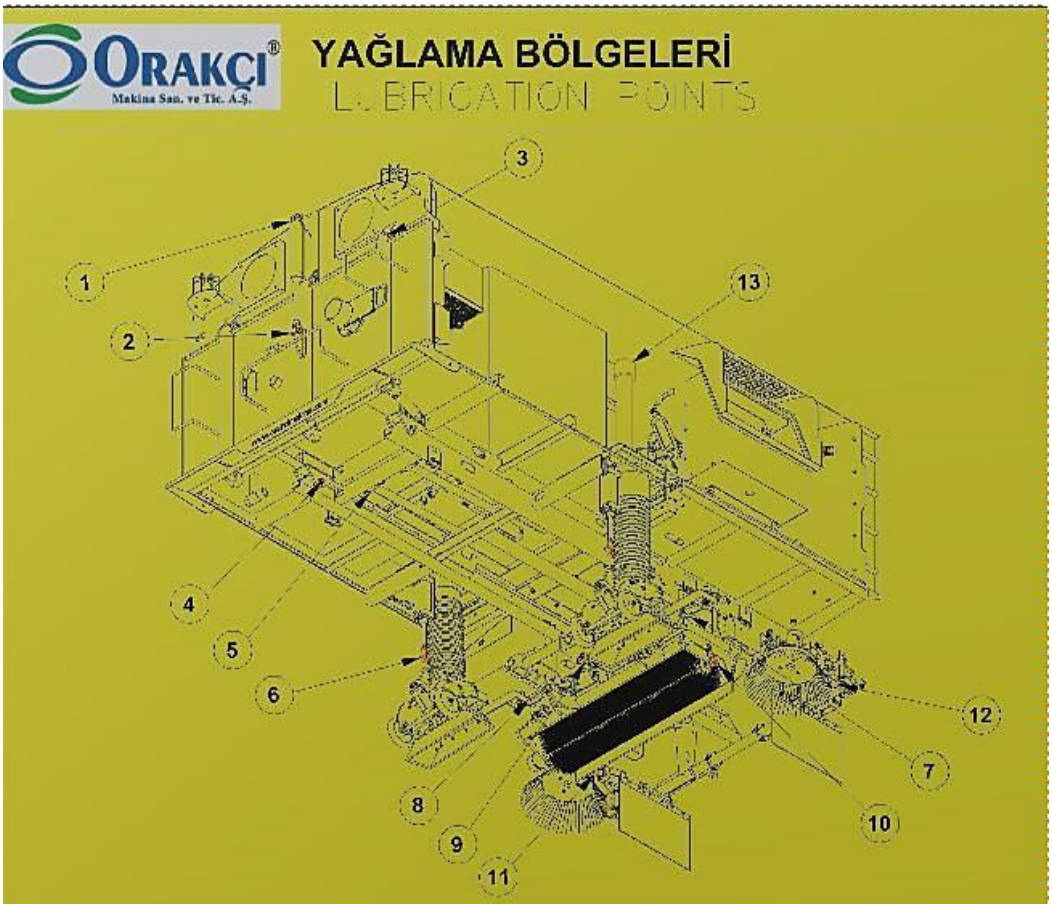
AFTER EVERY 2000 HOURS OF OPERATION, heavy maintenance should be done at the authorized service of the engine.

Perkins	Perkins Diesel Engine Oil 15W-40 API CI-4
Tümosan	Tümosan Crassus Engine Oil 15W-40
JCB	JCB Engine Oil 15W-40

Table 5.2: Recommended Engine Oil Brands

In case the recommended engine oils cannot be found, maximum attention should be paid to using the 15W-40 API CI-4 engine oil class.

After the equipment is used, the connecting shafts and bushings should be lubricated with grease (Calcium Based Industrial Grease No: 1 and 2) from the lubricator. Lubrication should be done at the intervals and areas determined on the label in Figure 5.2.



	YAĞLAMA BÖLGELERİ LUBRICATION POINTS	YAĞLAMA PERİYODU LUBRICATION PERIOD	MİKTAR AMOUNT (Gr.)
1	ARKA KAPAK PİSTON CİVATA TAILGATE CYLINDER BOLT	HAFTADA İKİ TWICE A WEEK	30
2	ARKA KAPAK PİSTON CİVATA TAILGATE CYLINDER BOLT	HAFTADA İKİ TWICE A WEEK	30
3	ARKA KAPAK HAREKET BURÇLARI TAILGATE MOVEMENT BUSHINGS	HAFTADA İKİ TWICE A WEEK	50
4	DAMPER KALDIRMA BURÇLARI DUMPER LIFTING BUSHINGS	HAFTADA İKİ TWICE A WEEK	50
5	DAMPER KİLİT BURCLARI DUMPER LOCKING SYSTEM BUSHINGS	HAFTADA BİR ONCE A WEEK	40
6	EMİŞ AĞZI PİSTONU ÇATAL AĞZI SUCTION NOZZLE PISTON ROD CLEVIS	HAFTADA İKİ TWICE A WEEK	30
7	EMİŞ AĞZI HAREKET BURCU SUCTION NOZZLE MOVEMENT BUSHING	HAFTADA İKİ TWICE A WEEK	40
8	EMİŞ AĞZI HAREKET ROD BURCU SUCTION NOZZLE MOVEMENT BUSHING	HAFTADA İKİ TWICE A WEEK	30
9	ORTA FIRÇA ROD BURCU MAIN BRUSH ROD BUSHING	HAFTADA İKİ TWICE A WEEK	30
10	ORTA FIRÇA RULMAN YATAĞI MAIN BRUSH BEARING	HAFTADA İKİ TWICE A WEEK	40
11	YAN FIRÇA PİSTONU ÇATAL AĞZI SIDE BRUSH PISTON ROD CLEVIS	HAFTADA İKİ TWICE A WEEK	30
12	YAN FIRÇA PİSTONU HAREKET BURCU SIDE BRUSH MOVEMENT BUSHING	HAFTADA BİR ONCE A WEEK	20
13	TELESKOBİK PİSTON MİLLERİ TELESCOBIC CYLINDER SHAFTS	HAFTADA İKİ TWICE A WEEK	40

*TAVSİYE EDİLEN YAĞ : KALSİYUM ESASLI ENDÜSTRİYEL GRES NO: 1
*RECOMMENDED OIL : CALCIUM BASED INDUSTRIAL GREASE OIL NO: 1

Figure 5.2: Lubrication Areas

5.2. Equipment Maintenance Table

Equipment Maintenance Table									
No	**Component / System**	**20 Hours**	**Once a day**	**Once a week**	**Once a month**	**Once in 3 Months**	**Once in 6 Months**	**Once in 12 Months**	**Service Check**
1	Hydraulic System	x			x				Check the connection fittings, and tighten if they are loose.
		x					x		Hydraulic installation suction filter must be changed.
		x					x		Hydraulic installation return filter must be changed.
							x		Oil must be changed in defined periods. (Viscosity: 68 for hot countries, 32 for cold countries, and 46 for Turkey.)
								x	Hydraulic oil must be drained, the tank must be cleaned and oil must be changed. (See User Manual)
		x				x			Piston seals tightness control.
		x				x			Checking the system operating pressure, pressure switch settings, etc. (See Hydraulic Circuit Diagram)
2	Pneumatic System	x			x				Check the valves, circuit elements, air tanks, connection fittings, coils, and tighten them if they are loose, and change them if they are damaged.
3	Electricity and Electrical Equipments	x		x					It should be checked whether they are working properly. If there is a failure, fix the failure by making a computer connection if necessary.
4	Safety Points	x				x			Safety gear must be checked. (Camera, reversing warning horn, etc.)

5	Hydraulic Pump Connection, PTO Output	x		x					It must be checked in terms of tightness and operation; it must be repaired or changed if necessary.
6	Lubrication	x		x					Lubrication points must be lubricated with grease according to the periods indicated in the table. (See User Manual)
7	Connection Joints	x			x				The integrity and tightness of the connecting joints must be checked.
8	Equipment Sections	x	x						The general cleaning of the equipment after operation must be checked.
		x	x						It should be checked if the operation areas of the equipment are damaged or not.
		x	x						Functional features (leakage, transport, etc.) should be checked.
9	Auxiliary Engine	x		x					Check the oil level, if there is not enough oil in ti, the oil recommended in Table 5.2 should be added. (If the replacement period has come, it will be replaced regardless of the reduction status.)
								x	If it exceeds the specified hour, the oil is changed with the oil recommended in Table 5.2. All filters are changed when this operation is carried out.
10	Moving Joints	x				x			Check and replace with original spare parts if worn.
11	Tailgate Rubber Sealing	x		x					Check and replace with original spare parts if worn or damaged.
12	Brush Group	x	x	x					Check and replace with original spare parts if worn or damaged.
13	Acoustic Foams and Body Bottom Frame Wicks	x		x					Check it and stick it back if it fell. Replace with original spare parts if worn or damaged.

Table 5.3: Equipment Maintenance Table

5.3. Failure - Cause - Solution Table

Order	Failure	Cause	Solution
1	There is no pressure in the system.	Auxiliary engine failure. Hydraulic pump failure. Valve failure. No oil in the oil tank. The suction filter is clogged. The ball valve in the suction line of the oil tank is closed.	ORAKÇI Add oil in the oil tank. Change the suction filter. Open the ball valve.
2	Hydraulic pump vibrates while operating.	The ball valve in the suction line is closed. Not enough oil in the oil tank. Oil leakage from the suction line. Problem in the suction line. Hydraulic pump failure.	Open the ball valve. Add oil in the oil tank. Tighten the suction line connections. Check the suction line. ORAKÇI
3	Tailgate or damper does not open or close.	Air in the hydraulic system. Clogged air in the suction line. PTO does not grasp. Hydraulic pump failure. Pump not pumping oil. Oil leakage from the cylinder or hydro motor.	Remove the air in the hydraulic system. Remove the clog or change the hose. Check the pneumatic hoses. Check the PTO. ORAKÇI

4	The tailgate does not stay in the opened position.	Oil leakage in direction control valves. Hydraulic cylinder failure.	ORAKÇI
5	The tailgate cannot be closed.	Tailgate safety valve failure.	ORAKÇI
6	Fan not working.	The hydraulic block coil coming off. Pile getting into the hydraulic block. Low pressure. The hydraulic block being broken.	Check is the coil is in its place. If it came off, put it back to its place. Carefully clean the hydraulic block. Check if the gas piston on the auxiliary engine is working. ORAKÇI
7	The irrigation system is not working.	Valves are turned off or down. No electricity to the water pump. Clogged sprinkle nozzles. Broken electricity pump.	Check the valves. Check the electric connections. Dismantle the sprinkle nozzles and clean them. If I cannot be cleaned, order a new one from ORAKÇI. ORAKÇI
8	Brush and bucket groups are not working.	Leakage in the pneumatic lines coming to the brush and bucket lines. Oil leakage in hydro motors. Hydraulic cylinder failure.	Leakage control in the pneumatic lines coming to the brush and bucket lines must be performed. Check the bolts and connections. If it cannot be fixed, replace the hydro motor. ORAKÇI

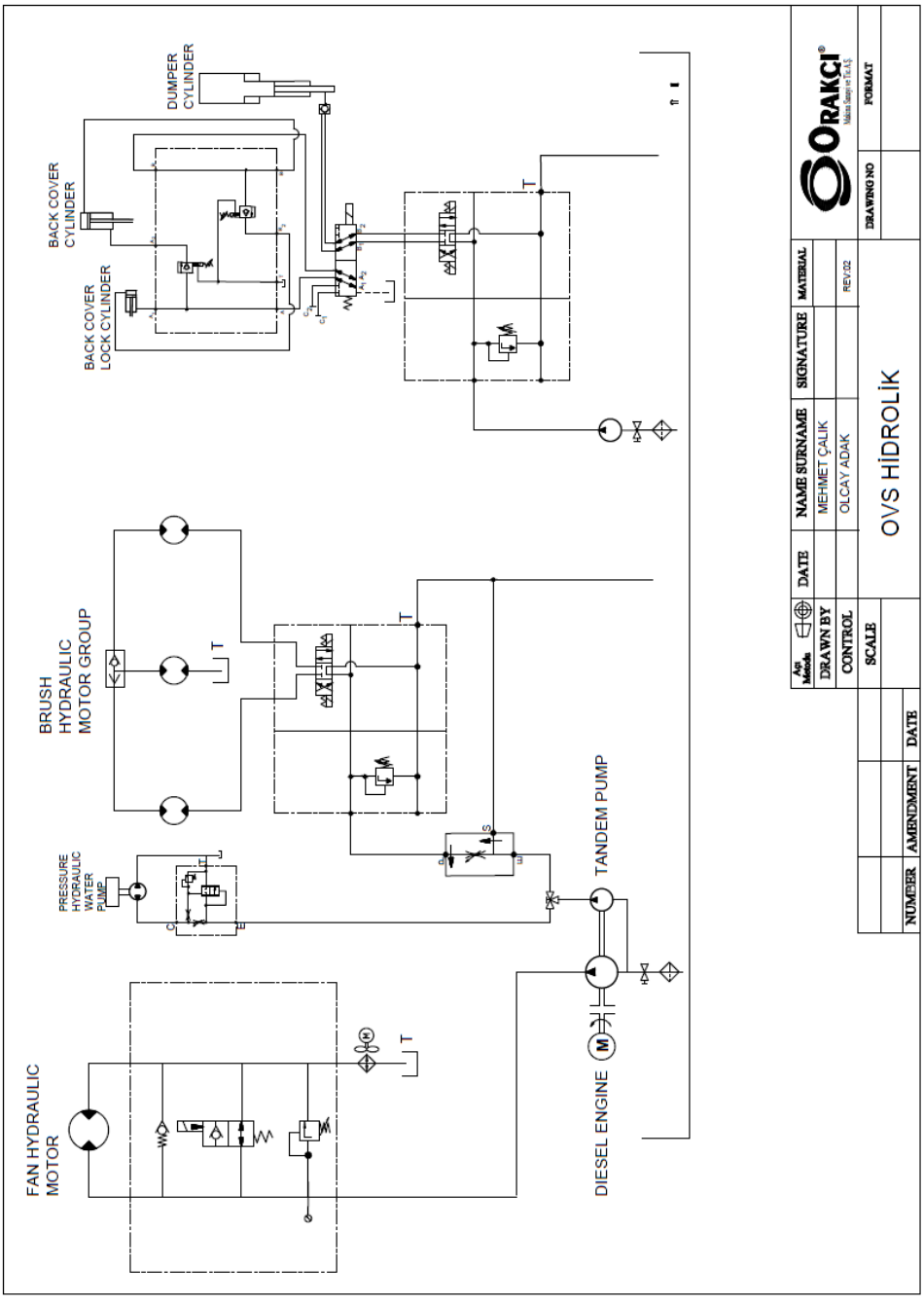
9	The pressure washing gun is not working.	PTO does not grasp.	Check the pneumatic hoses.
		Hydraulic pump failure.	Check the PTO.
		3-way valve not fitting properly.	Turn it in the opposite direction again and return it to its former position.
		Water pump failure.	Add water to the water pump and turn it on again.
		Clogged washing gun nozzle.	Nozzle is dismantled and cleaned. If I cannot be cleaned, order a new one from ORAKÇI.
		If it is still not working after these interventions,	ORAKÇI

Table 5.4: Failure Cause Solution Table

5.4 Circuit Diagrams

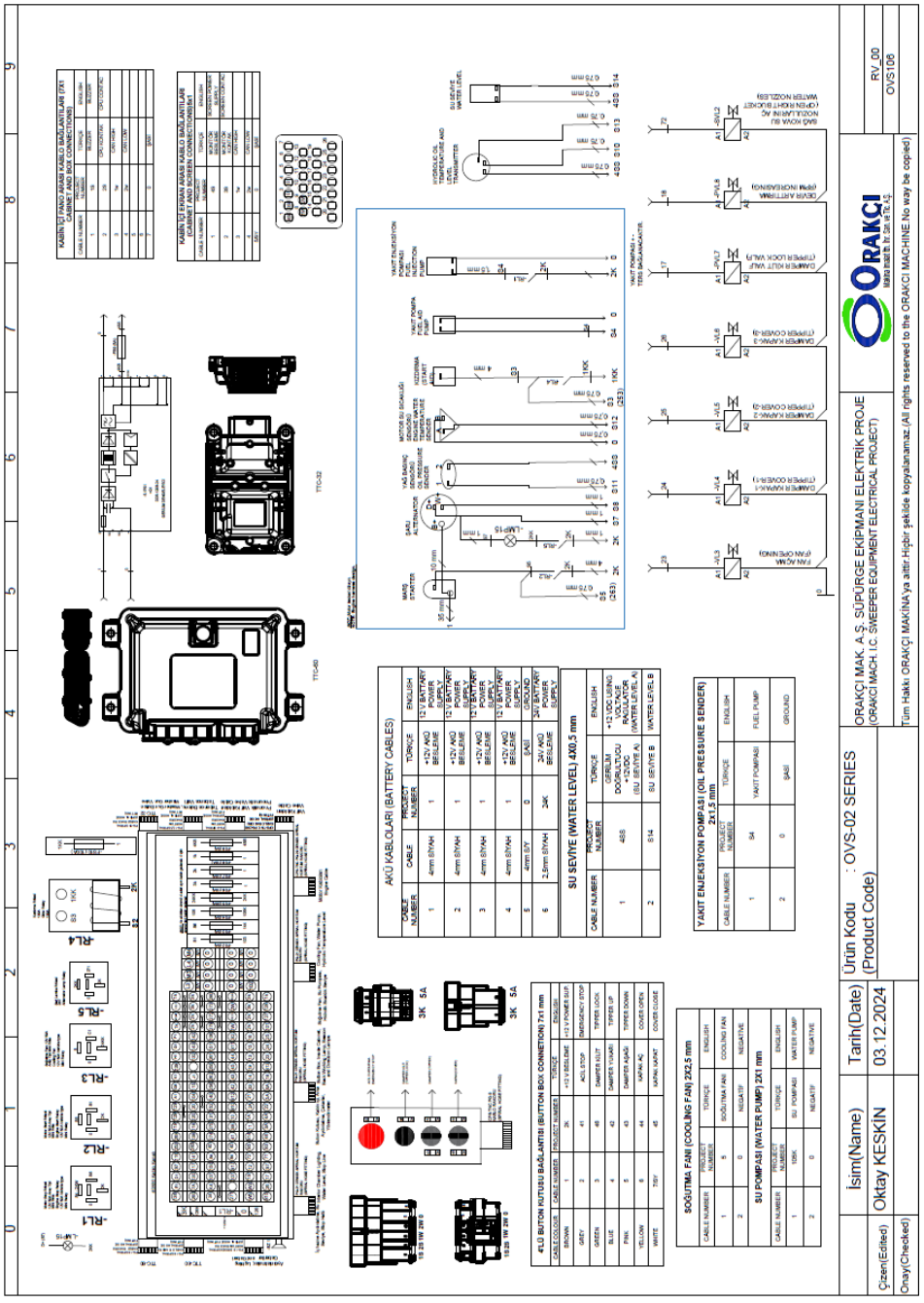
The circuit diagrams shared by our customers below cannot be shared with 3rd parties or cannot be copied. Otherwise, legal sanctions are imposed by Orakçı Makina.

5.4.1. Hydraulic Circuit Diagram

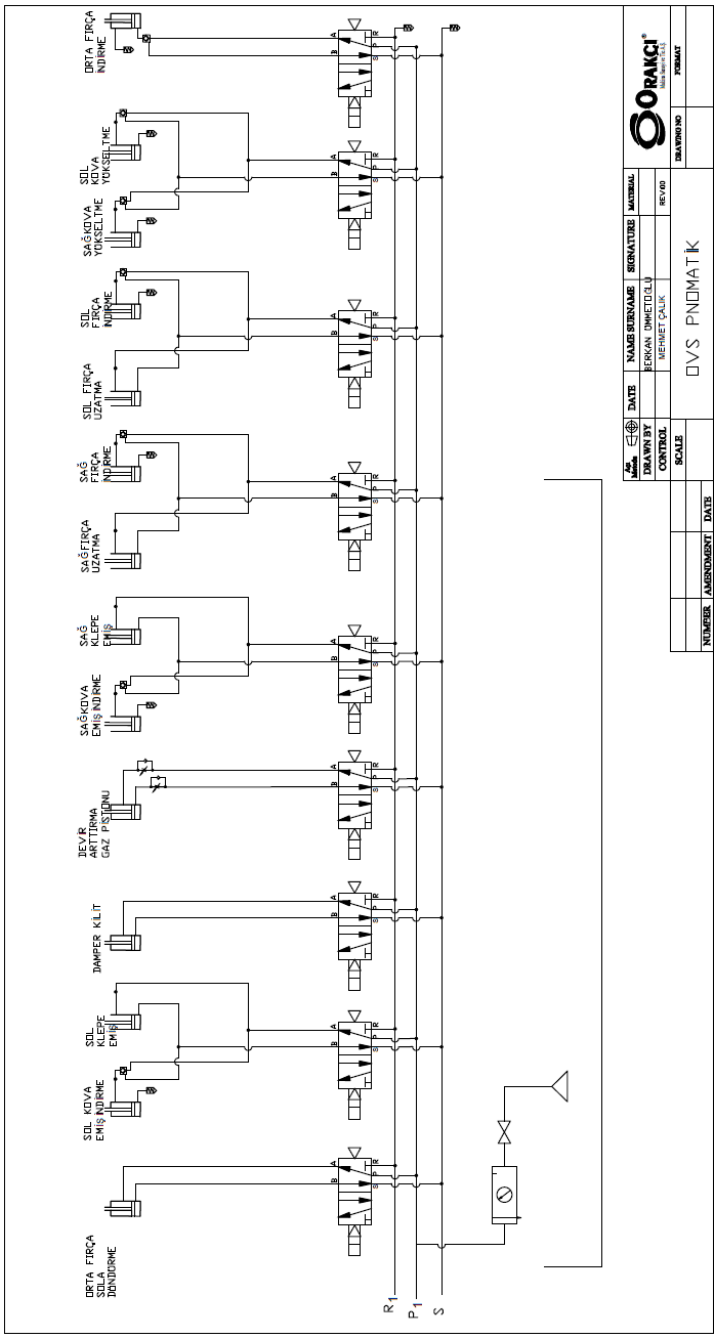


Technical Drawing 5.1: Hydraulic Circuit Diagram

5.4.2. Electrical Circuit Diagram



Technical Drawing 5.2: Electrical Circuit Diagram



Technical Drawing 5.3: Electrical Circuit Diagram

6. SPARE PARTS LISTS

6.1. Product Assembly

6.1.1. Body Assembly

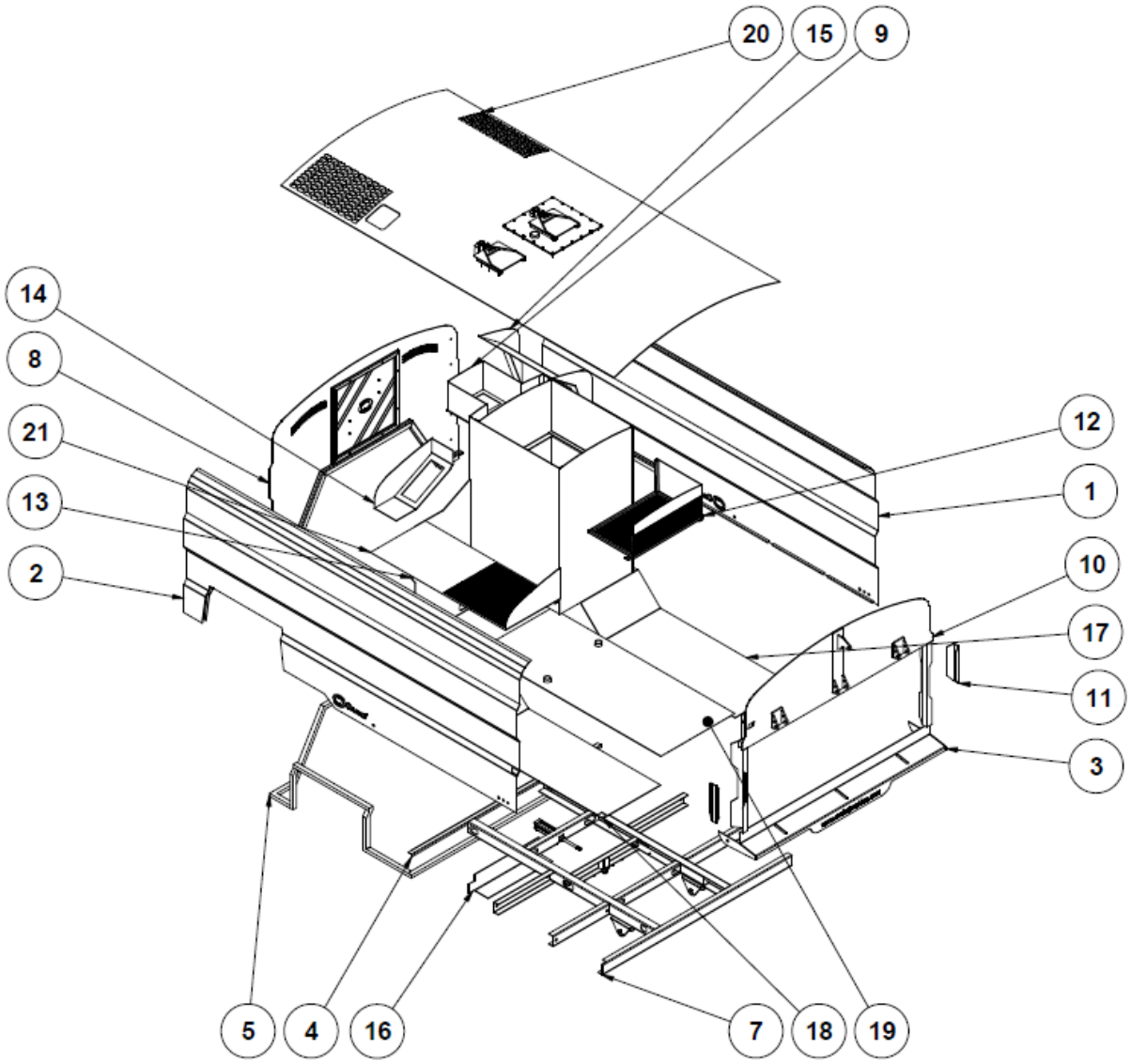


Figure 6.1: Body Assembly

Ref	Part Code	Description	Op	Quan
1	OVS104KSMRAA003	Body Side Wall Right	S	1
2	OVS104KSMRAA004	Body Side Wall Left	S	1
3	OVS104KSMSAA021	Stainless Website Assembly	S	1
4	OVS104KSPSAA068	Engine Compartment Cover Part	S	1
5	OVS104KSPSAA068	Engine Compartment Wick Assembly (Geti)	S	1

6	OVSALLKSMSAA002	Flap Piston Connection Wall Right	S	1
7	OVS104KSMSAA083	Top Chassis	S	1
8	OVS104KSMRAA008	Body Front Wall	S	1
9	OVS104KSMRAA011	Stainless Water Tank and Fan Evacuation Line	S	1
10	OVS104KSMRAA012	Body Rear Wall	S	1
11	OVS104KSPSAA250	Rear Wall Pillar Closure Part	S	2
12	OVSALLKSMSAA016	Center Suction Screen	S	1
13	OVSALLKSMSAA008	Flap Piston Connection Wall Left	S	1
14	OVS104KSMSAA080	Suction Chimney	S	1
15	OVS104KSMSAA086	Radiator Chimney	S	1
16	OVS104KSPSAA285	Upper Chassis Closing Part	S	1
17	OVS104KSMSAA087	Suction Chimney and Waste Reservoir Base Right	S	1
18	OVSALLKSMSAA021	Suction Chimney and Waste Reservoir Base Left	S	1
19	OVS104KSMSAA088	Stainless Water Tank and Waste Reservoir Base	S	1
20	OVS104KSMSAA094	Body Roof	S	1
21	OVS104KSMSAA095	Suction Screen and Canal	S	1

Table 6.1: Body Assembly Elements Table

6.1.2. Sub Group Assembly

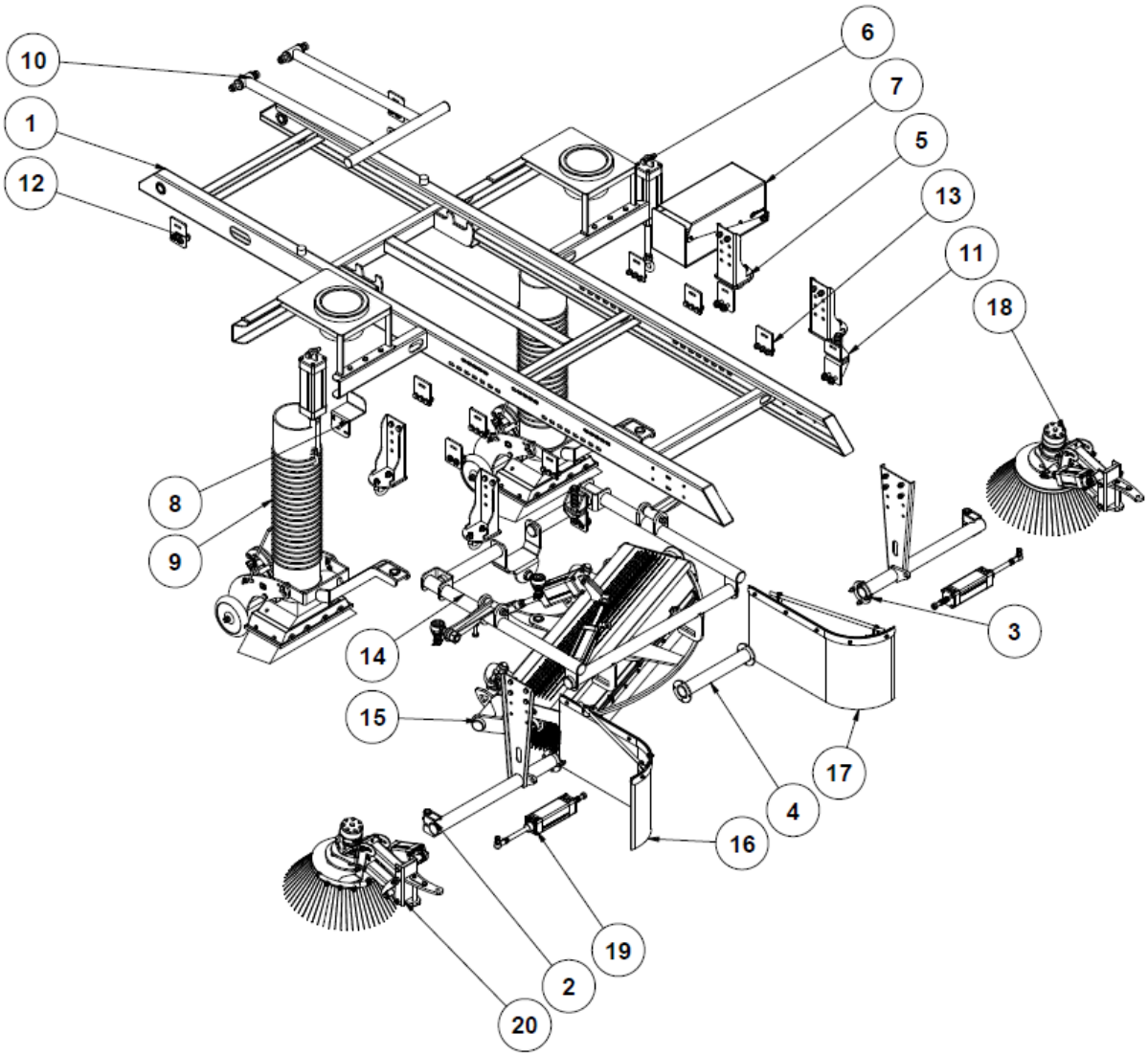


Figure 6.2: Sub Group Assembly

Ref	Part Code	Description	Op.	Quantity
1	OVS104SAGSAA003	Chassis Group Assembly	S	1
2	OVSALLAGMSAA029	Side Brush Connection Group Assembly Right	S	1
3	OVSALLAGMSAA028	Side Brush Connection Group Assembly Left	S	1
4	OVSALLAGMSAA005	Side Brush Groups Connection Pipe	S	1
5	OVSALLAGMSAA007	Sub Group Bracket	S	4
6	OVSALLAGMSAA017	Suction Bucket Piston Assembly	S	2
7	TMOALLKSMSAA003	Battery Protection Assembly	S	1
8	OVSALLAGPSAA030	Water Suction Filter Connection Plate	S	1
9	OVSALLEAGSAA001	Suction Bucket and Hose Installation	S	2
10	OVS104AGMSAA029	Damper Safety	S	1

11	TMOALLBRMSAA003	L Connection Bracket	S	2
12	TMOALLBRPSAA001	I Connection Bracket	S	4
13	OVSALLAGMSAA020	Equipment Chassis I Connection Bracket	S	6
14	OVSALLAGMSAA024	Sub Group Assembly	S	1
15	OVSALLOFGSAA002	Middle Brush Assembly	S	1
16	OVSALLAGMSAA026	Side Brush Mud Guard Right	S	1
17	OVSALLAGMSAA025	Side Brush Mud Guard Left	S	1
18	OVSALLYFGSAA003	Side Brush Assembly Left	S	1
19	OVSALLAGMSAA027	Side Brush Piston Assembly	S	2
20	OVSALLYFGSAA004	Side Brush Assembly Right	S	1

Table 6.2: Sub Group Assembly Elements Table

6.1.3. Engine Compartment Assembly

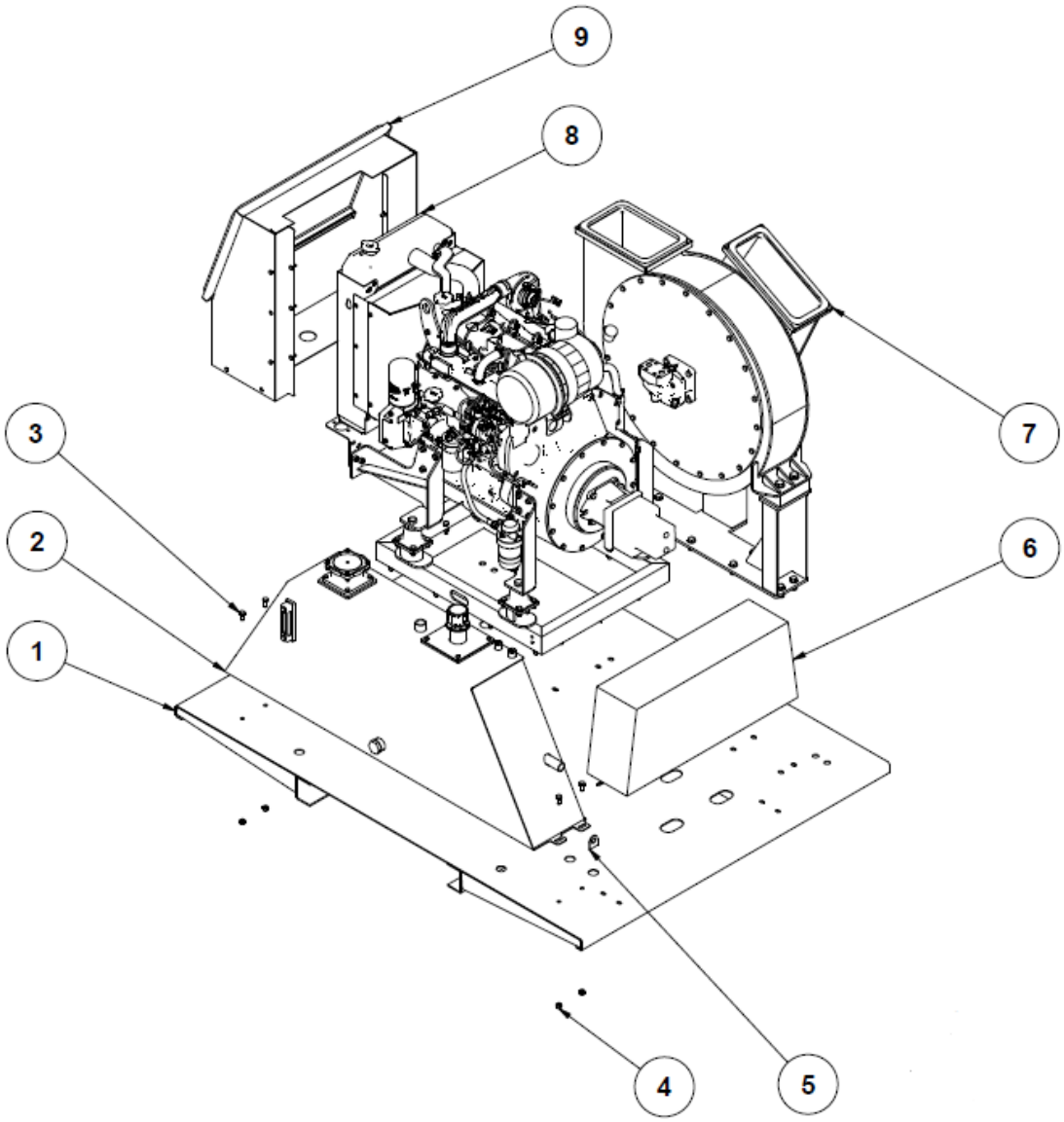


Figure 6.3: Engine Compartment Assembly

Ref	Part Code	Description	Op	Name
1	OVSALLMBMSAA008	Engine Compartment Base Assembly	S	1
2	OVSALLMBMSAA001	Oil Tank	S	1
3	100100070100	M12x25 Bolt/ 8.8 Quality / Galvanized / Hexagon Head Full Pass	S	4
4	100200400006	M12 Nuts / Quality 8 / Galvanized / Fibered	S	4
5	TMOALLVUPSAA008	Sensor Sheet	S	1
6	OVSALLMBPSAA001	Electricity and Pneumatic Panels	S	1
7	OVSALLFSGSAA006	Fan General Assembly	S	1
8	OVS104MBMSAA020	Auxiliary Assembly	S	1
9	101400920001	Radiator Chimney Adaptor	S	1

Table 6.3 : Engine Compartment Assembly Elements Table

6.1.3.1. Fan Assembly

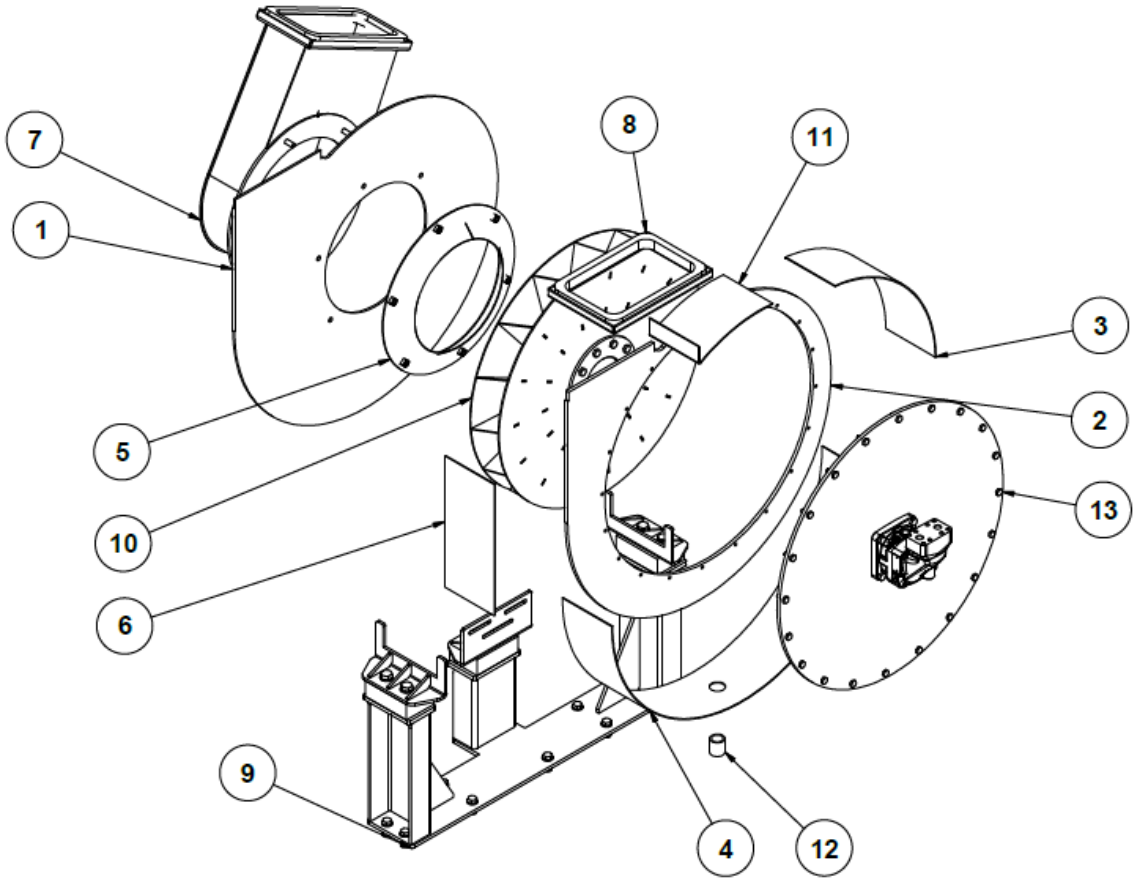


Figure 6.4: Fan Assembly

Ref	Part Code	Description	Op.	Quant
1	OVSALLFSPSAA056	Fan Suction Part Side Wall	S	1
2	OVSALLFSPSAA057	Fan Hydro Motor Connection Flange	S	1
3	OVSALLFSPSAA037	Snail Spacer Plate 3	S	1
4	OVSALLFSPSAA058	Snail Spacer Plate 2	S	1
5	OVSALLFSMSAA018	Venturi	S	1
6	OVSALLFSPSAA059	Snail Spacer Plate 1	S	1
7	OVSALLFSMSAA022	Fan Suction Chimney	S	1
8	OVSALLFSMSAA023	Fan Blow Nozzle	S	1
9	OVSALLFSMSAA026	Snail Bracket Assembly	S	1
10	OVSALLFSMSAA030	Fan Wheel	S	1
11	OVSALLFSPSAA060	Snail Spacer Plate 4	S	1
12	100500510008	1 " Sleeves / Black / Full	S	1
13	OVSALLFSMSAA031	Hydro Motor Connection Walls	S	1

Table 6.4 : Fan Assembly Elements Table

6.1.3.2. Oil Tank Assembly

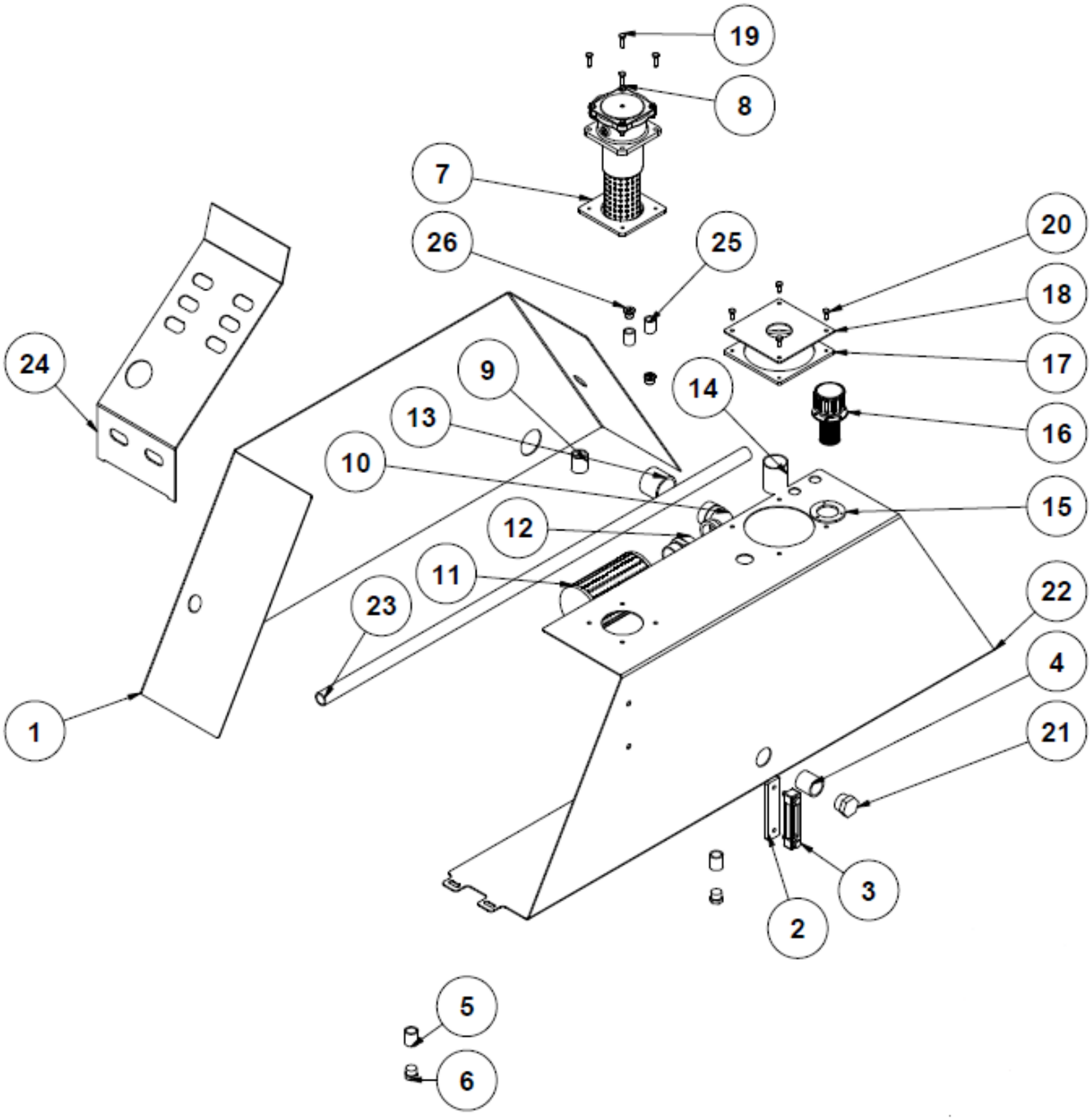


Figure 6.5: Oil Tank Assembly

Ref	Part Code	Description	Optional	Name
1	OVSALLMBPSAA002	Engine Compartment Inner Wall	S	1
2	OVSALLMBPSAA003	Thermometer Connection Sheet	S	1
3	050500160003	127 mm Level Indicators / Oil Level Indicators / Witl Thermometer	S	1
4	100500510007	1 1/4" Sleeves / Black / Full	S	1
5	100502070001	3/4 " Sleeves / Black / Full	S	2
6	050400410005	3/4" Hydraulic Fittings / BSP / Blind Plugs	S	2
7	TMOALLYTPSAA007	Return Line Block Sheet	S	1

8	050200070003	GYD 41-60 1 1/4" 340 lt/min Return Line Filter	S	1
9	100500510008	1 " Sleeves / Black / Full	S	1
10	050100030004	2 " / Plumbing Unions / Tailed Bends / Galvanized	S	1
11	050200060007	2" 300 lt / min Hydraulic Filters / Suction Line Filter	S	1
12	050100480006	2" Hydraulic Fittings /Nipples	S	1
13	100500510010	2 " Sleeves / Black / Full	S	1
14	TMOALLYTTSAA001	Oil Tank Oil Fill Pipe	S	1
15	TMOALLYTPSAA006	Oil Fill Pipe Flange	S	1
16	100700540009	Oil Tank Cover	S	1
17	OVSALLMBPSAA004	Return Filter Connection Flange 1	S	1
18	OVSALLMBPSAA005	Return Filter Connection Flange 2	S	1
19	100100070008	M8x30 mm Bolts / 8.8 Quality/ Galvanized / Hexagonal Head Full Pass	S	4
20	100100070007	M8x20 mm Bolts / 8.8 Quality/ Galvanized / Hexagonal Head Full Pass	S	4
21	050400410007	Hydraulic Fittings / BSP / Blind Plugs / 1 1/4" Hex Head Blind Plug	S	1
22	OVSALLMBPSAA006	Engine Compartment Outer Wall	S	1
23	OVSALLMBPSAA007	Oil Tank Cooling Water Pipe	S	1
24	OVSALLMBPSAA008	Oil Tank Breakwater	S	1
25	100500510001	1/2 " Sleeves / Black / Full	S	2
26	050400290001	1/2" Hydraulic Fittings / Metric / Galvanized/ Blind Plugs	S	2

Table 6.5: Oil Tank Connection Elements Table

6.1.3.3. Auxiliary Assembly

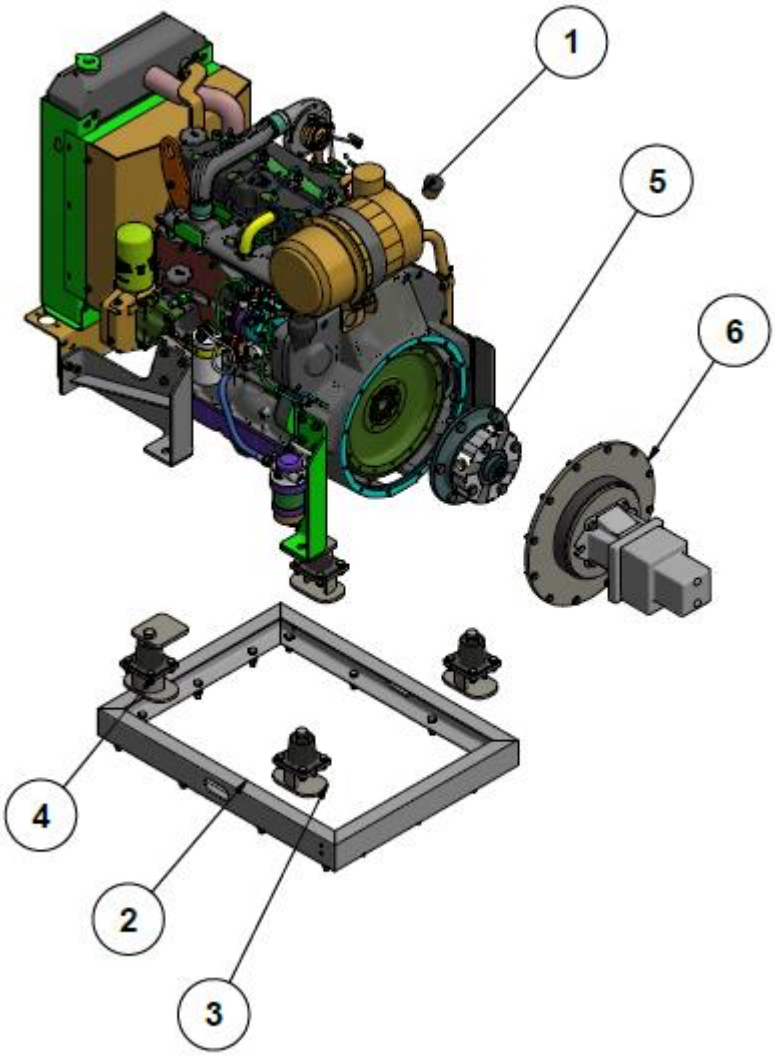


Figure 6.6: Auxiliary Engine Assembly

Ref	Part Code	Description	Op.	Nar
1	130100010006	4DT-39T-195C Model JCB Engine	S	1
	130100010007	4DT39I95B Model Tümosan Engine		
	130100010005	Perkins 85 KW 1104D-44TA Engine		
2	OVSALLMBMSAA009	Engine Stand	S	1
3	OVSALLMBMSAA002	Engine Front Mounts	S	2
4	OVSALLMBMSAA015	Engine Rear Mounts	S	2
5	OVS104MBMSAA014	Coupling Assembly	S	1
6	OVS104MBMSAA025	Hydraulic Pump and Flywheel Housing Assembly	S	1

Table 6.6: Auxiliary Engine Assembly Elements Table

6.1.4. Tailgate Assembly

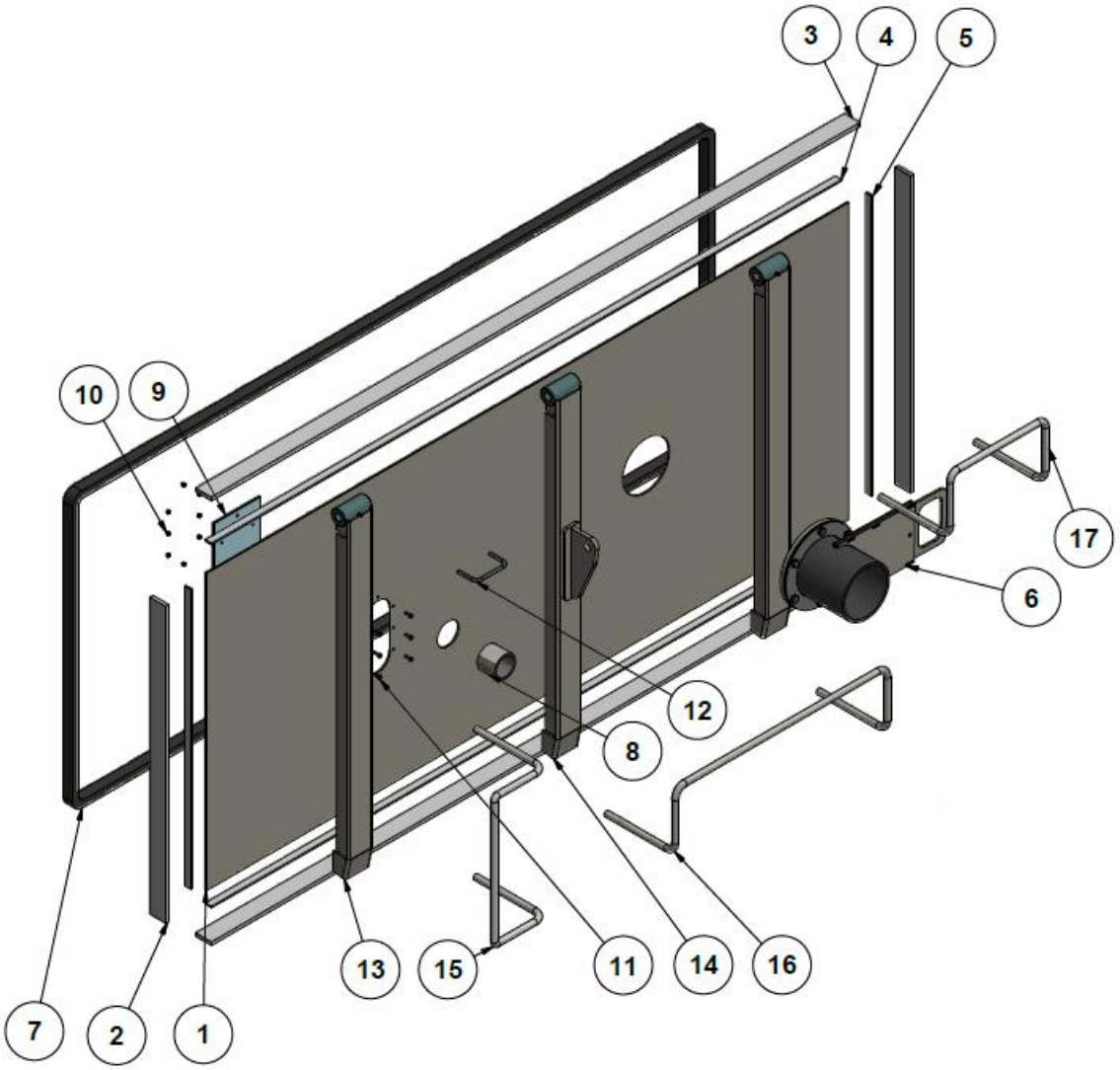


Figure 6.7: Tailgate Assembly

Ref	Part Code	Description	Op	Name
1	OVSALLAKPSAA003	Tailgate Base Sheet	S	1
2	OVSALLAKPSAA004	Frame Short Side Part	S	2
3	OVSALLAKPSAA005	Frame Long Side Part	S	2
4	OVSALLAKPSAA006	Wick Frame Long Side Part	S	2
5	OVSALLAKPSAA007	Wick Frame Short Side Part	S	2
6	TMOALLAKMSAA004	Suction Hose Shutter	S	1
7	OVSALLAKPSAA008	Tailgate Wick	S	1
8	100500510010	Sleeves / Black / Full / 2"	S	1
9	102401460011	250x150x5 mm / Machine Consumables / Flexiglass Glass	S	1
10	100200400008	Nuts / Quality 8 / Galvanized / Fibered / M5	S	8

11	100100190045	Bolts / 10.9 Quality / Galvanized / Hexagonal Head Full Pass M5x16 mm	S	8
12	OVSALLAKPSAA001	Discharge Hose Anchoring Shaft	S	1
13	OVSALLAKMSAA001	Tailgate Side Column	S	2
14	OVSALLAKMSAA002	Tailgate Center Column	S	1
15	OVSALLAKPSAA009	Suction Hose Left Housing	S	1
16	OVSALLAKPSAA018	Suction Hose Center Housing	S	1
17	OVSALLAKPSAA011	Suction Hose Top Housing	S	1

Table 6.7: Tailgate Connection Elements Table

6.1.5. Stainless Water Tank and Fan Evacuation Line Assembly

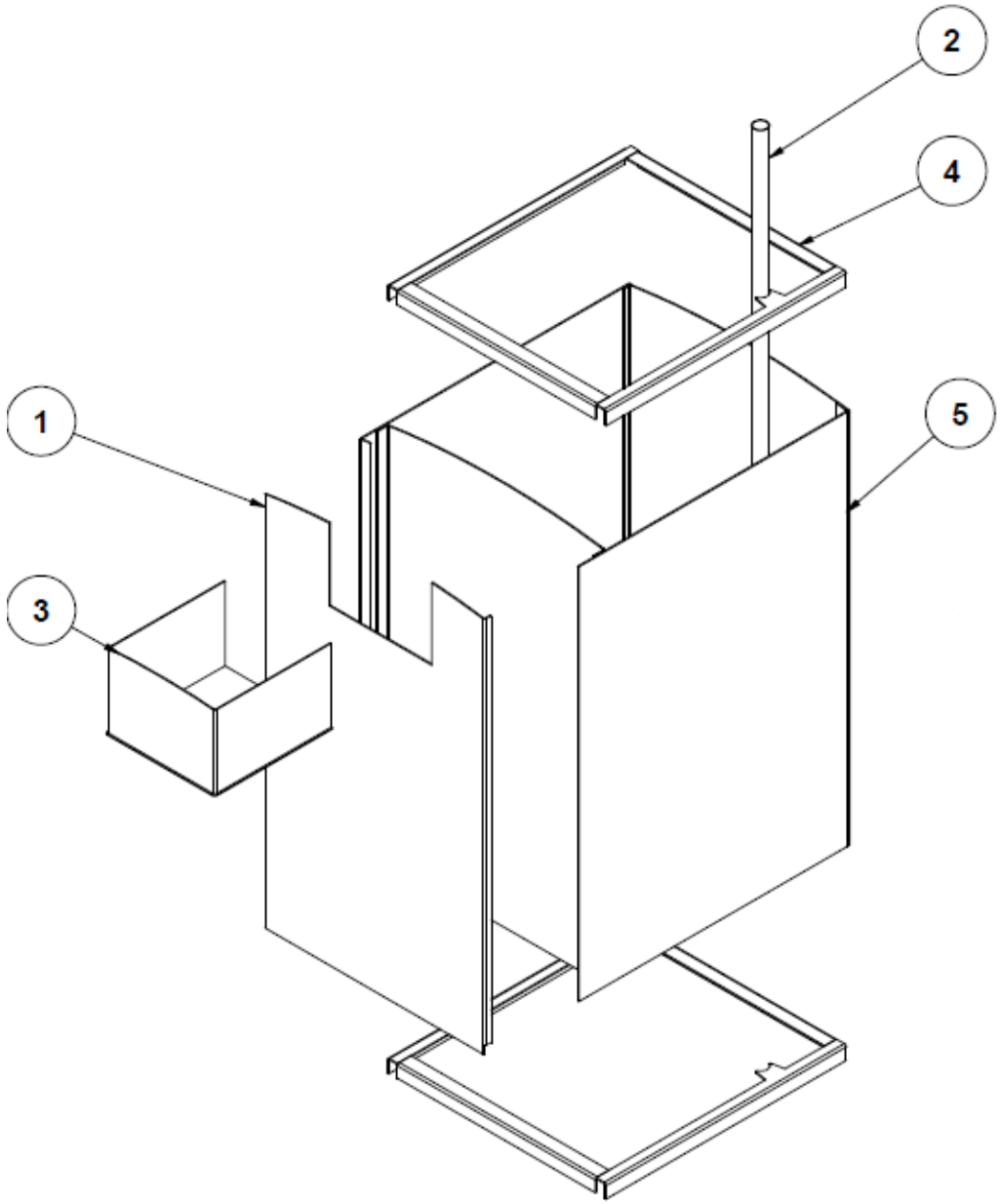


Figure 6.8: Water Tank Assembly

Ref	Part Code	Description	Op	Nar
1	OVS104KSPRAA036	Fan Evacuation Line Closing Sheet	S	1
2	OVS104KSPSAA275	Water Filling Pipe	S	1
3	OVS104KSMSAA084	Fan Evacuation Line Chimney	S	1
4	OVS104KSMRAA009	Water Tank Frame	S	2
5	OVS104KSMRAA010	Water Tank Stainless Wall Assembly	S	1

Table 6.8: Water Tank Assembly Elements Table

6.1.6. Side Brush Assembly

6.1.6.1. Left Side Brush Assembly

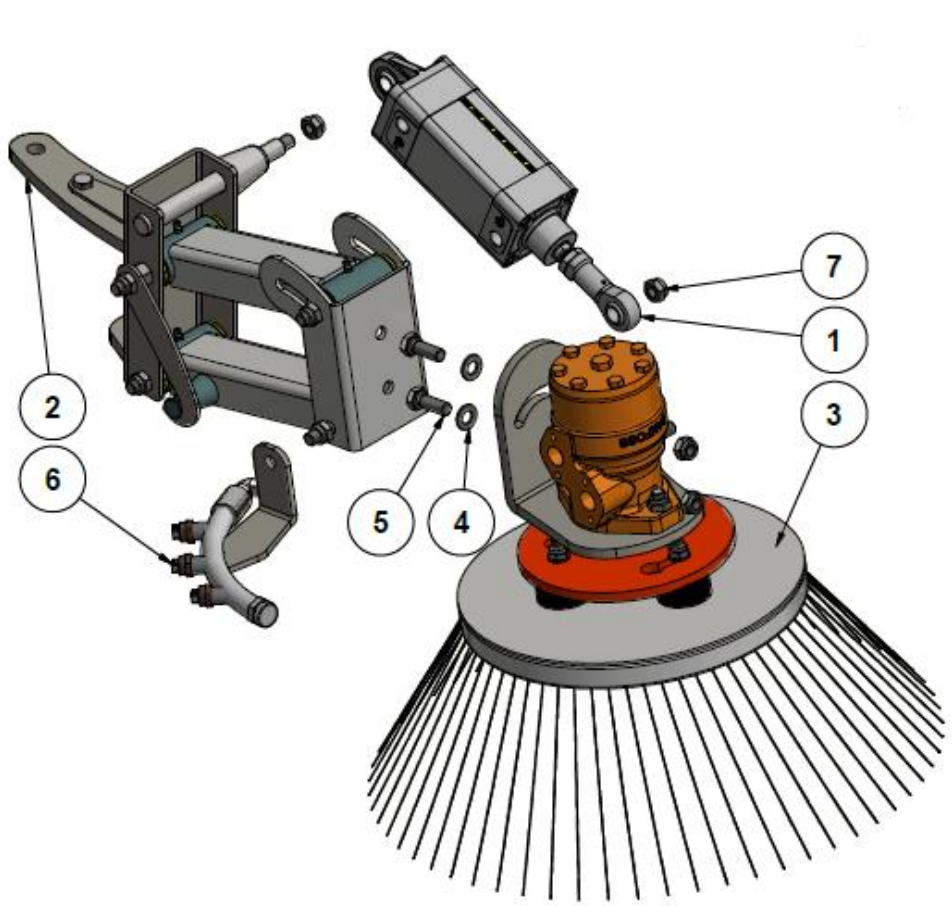


Figure 6.9: Left Side Brush Assembly

Ref	Part Code	Description	Opt.	Quant
1	OVSALLYFMSAA008	Side Brush Piston Assembly	S	1
2	OVSALLYFMSAA017	Left Side Brush Chassis	S	1
3	OVSALLYFMSAA001	Side Brush Assembly	S	1
4	101100680008	Washers/ Washer / M12	S	2
5	100100070036	Bolts / 8.8 Quality / Galvanized / Hexagonal Head Full Pass / M12x35 mm	S	2
6	OVSALLYFMSAA015	Side Sprinkle Nozzles Assembly	S	1
7	100200400006	Nuts / Quality 8 / Galvanized / Fibered / M12	S	4

Table 6.9: Left Side Brush Elements Table

6.1.6.2. Right Side Brush Assembly

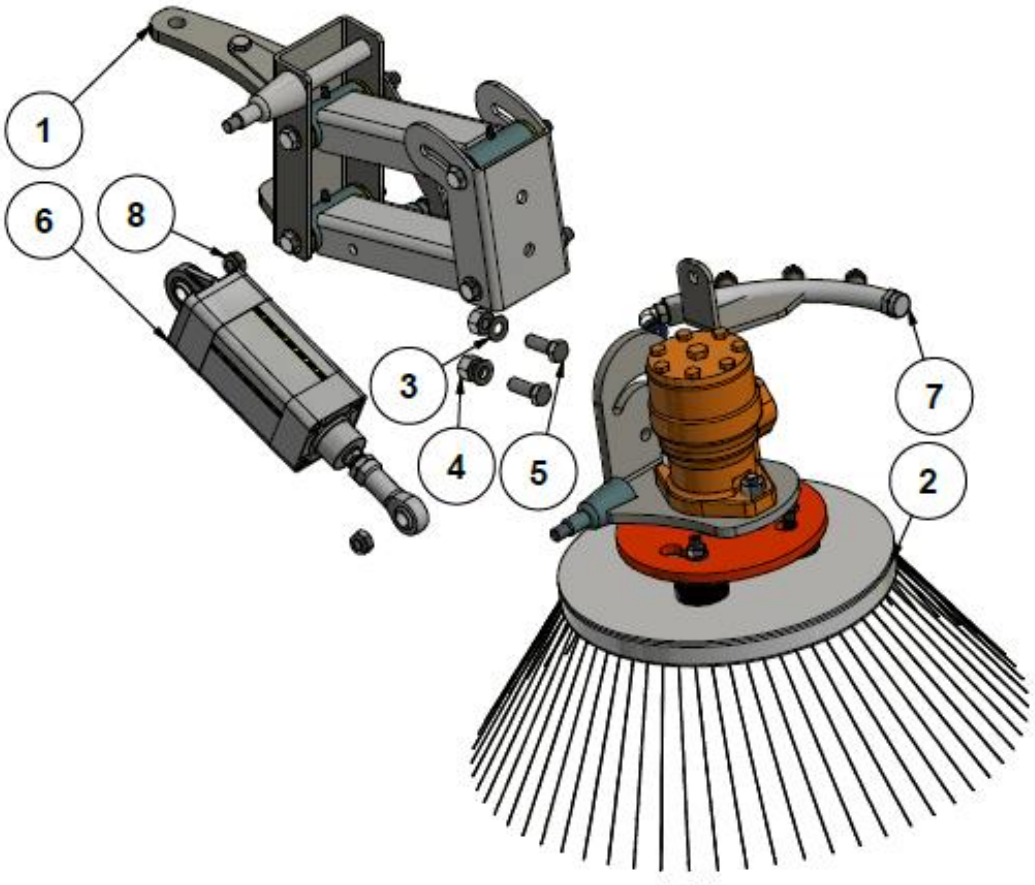


Figure 6.10: Right Side Brush Assembly

Ref	Part Code	Description	Opt.	Quant
1	OVSALLYFMSAA022	Right Side Brush Chassis	S	1
2	OVSALLYFMSAA001	Side Brush Assembly	S	1
3	101100680008	Washers/ Washer / M12	S	2
4	100200400006	Nuts / Quality 8 / Galvanized / Fibered / M12	S	2
5	100100070036	Bolts / 8.8 Quality / Galvanized / Hexagonal Head Full Pass / M12x35 mm	S	2
6	OVSALLYFMSAA008	Side Brush Piston Assembly	S	1
7	OVSALLYFMSAA015	Side Sprinkle Nozzles Assembly	S	1
8	100200400006	Nuts / Quality 8 / Galvanized / Fibered / M12	S	2

Table 6.10: Right Side Brush Elements Table

6.1.7. Middle Brush Assembly

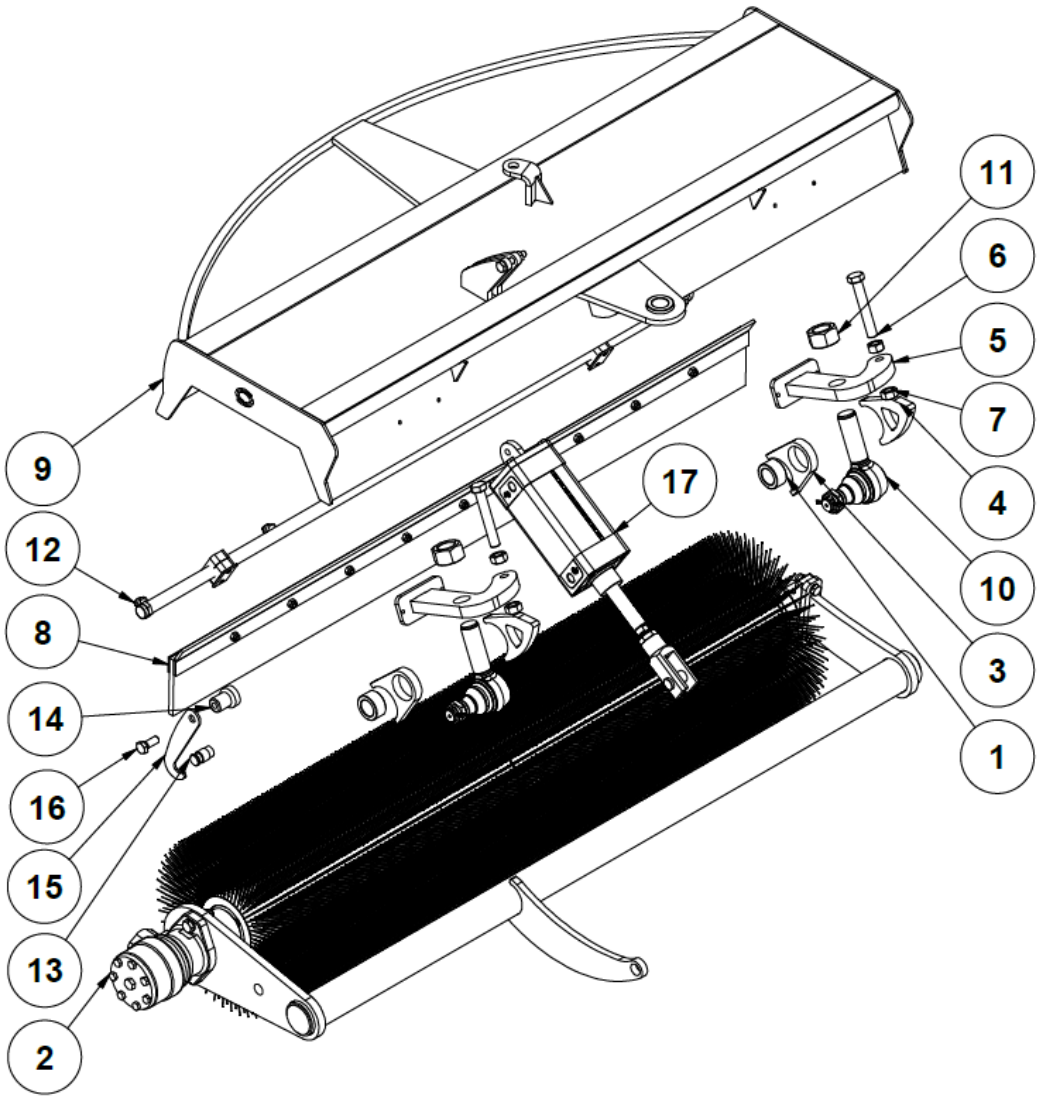


Figure 6.11: Middle Brush Assembly

Ref	Part Code	Description	Optional	Quantity
1	OVSALLVUTSAA001	Steering Rod Bushing	S	2
2	OVSALLOFMSAA011	Hydro Motor Middle Brush Assembly	S	1
3	OVSALLOFPSAA023	Steering Rod Bushing Connection Sheet	S	2
4	OVSALLOFPSAA024	Adjustment Screw Support Part	S	2
5	OVSALLOFMSAA001	Adjustment Bedding	S	2
6	100100190001	Bolts / 10.9 Quality / Galvanized / Hexagonal Head Full Pass / M16x100 mm	S	2
7	100200360010	Nuts / Grade 10 / Galvanized / Hexagon / M16	S	4
8	OVSALLOFMSAA013	Middle Brush Mud Guard Assembly	S	1

9	OVSALLOFMSAA012	Middle Brush Chassis	S	1
10	106402210001	Middle Brush Steering Rod	S	2
11	100200370012	Nuts / Grade 10 / Galvanized / Hexagon / M30x1.5	S	2
12	OVSALLOFMSAA008	Middle Sprinkle Nozzles Assembly	S	1
13	OVSALLOFTSAA006	Middle Brush Lower Lock Shaft	S	1
14	OVSALLOFTSAA005	Middle Brush Upper Lock Shaft	S	1
15	OVSALLVUPSAA005	Locking Hook	S	1
16	100100070090	Bolts / 8.8 Quality / Galvanized / Hexagonal Head Full Pass / M12x30 mm	S	1
17	OVSALLOFMSAA010	Middle Brush Piston Assembly	S	1

Table 6.11: Middle Brush Assembly Elements Table

6.2. Hydraulics and Pneumatics Assemblies

6.2.1. Positions of Hydraulic Pistons

Figure 6.12: Assembly Positions of Hydraulic Pistons

Ref	Part Code	Description	Optional	Quantity
1	TMOALLHDPSAA001	Tailgate Lock Piston	S	1
2	TMOALLHDPSAA004	Damper Piston	S	1
3	TMOALLHDPSAA003	Tailgate Piston	S	1

Table 6.12: Hydraulic Pistons Table

6.2.2. Positions of Pneumatic Pistons

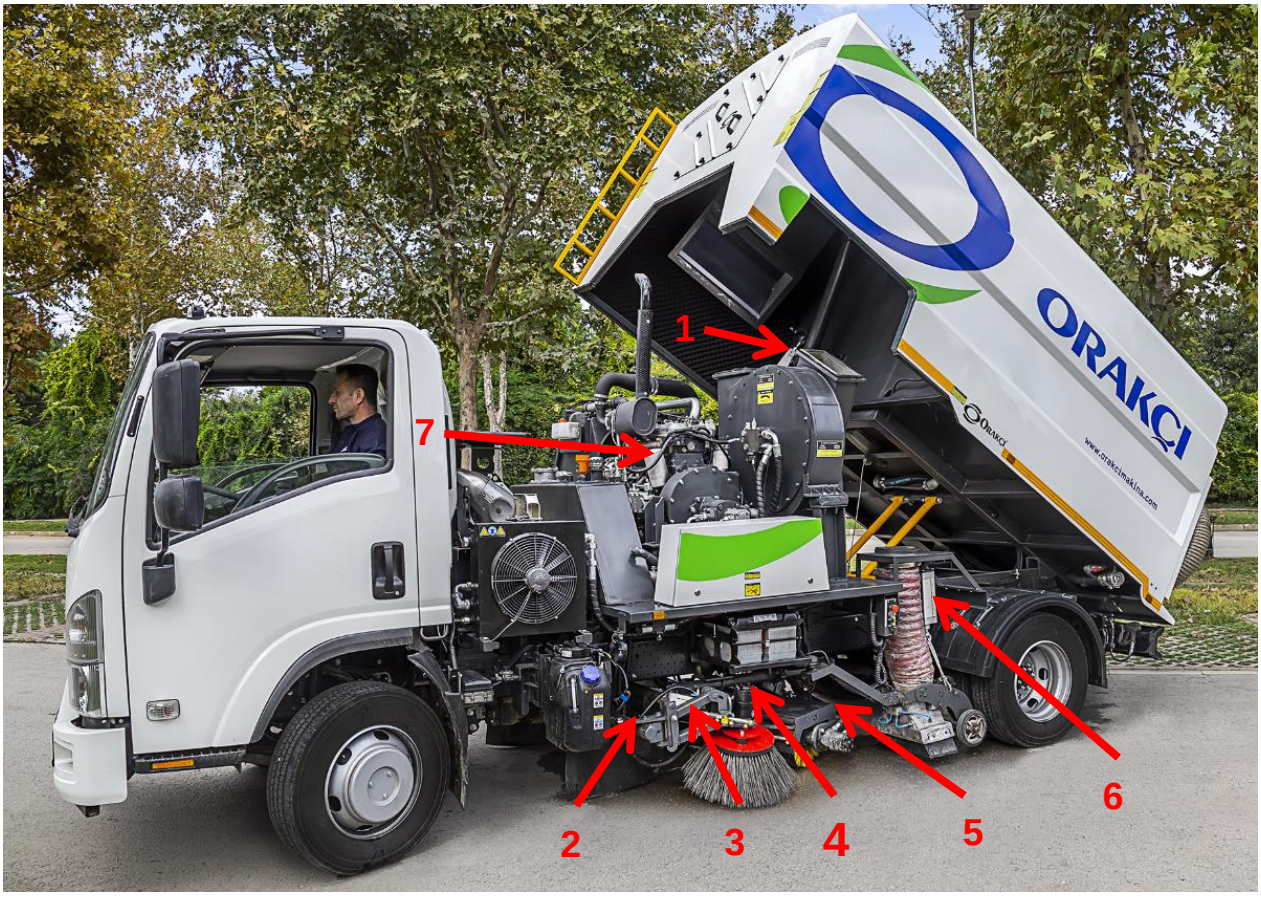


Figure 6.13: Assembly Positions of Pneumatic Pistons

Ref	Part Code	Description	Optional	Quantity
1	OVSALLKSMSAA005	Suction Bucket Flap Piston	S	2
2	OVSALLAGMSAA072	Side Brush On-Off Piston	S	2
3	TMOALLPNPSAA003	Side Brush Up-Down Piston	S	2
4	OVSALLAGMSAA022	Middle Brush Right-Left Rotation Piston	S	1
5	OVSALLOFMSAA007	Middle Brush Up-Down Piston	S	1
6	OVSALLEAMSAA003	Bucket Up-Down Piston	S	2
7	TMOALLPNMSAA001	Auxiliary Engine Throttle Piston	S	1

Table 6.13: Pneumatic Pistons Table

7. CRITICAL SPARE PARTS LIST

OVS CRITICAL SPARE PARTS LIST							
SERIAL	**CODE**	**NAME**	**UNIT**	**QUANT**	**VISUAL**	**DESCRIPTION**	**CHANGE TIME**
1	SEE HYDRAULIC and PNEUMATIC ASSEMBLIES	Pistons				Pistons suitable for equipment must be selected.	They must be checked during daily periodic maintenance, and the grease fittings must be lubricated. They must be replaced when they have gone under physical deformation.
2	SEE PISTON REPAIR KIT	Piston Repair Kits				Used according to the pistons.	Oil leakages must be checked during daily periodic maintenance. Change time varies according to the operating times and conditions.
3	050300670009 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Plate Group / BS5797.000 3-Way Flow Divider + NG6 Safety Block	QUANTITY	1		Used to adjust the brush speeed.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
4	050300150032 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Solenoid Valves / DVS6 3/8" 50 L 315 Bar 12 V Control Valve	QUANTITY	1			It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.

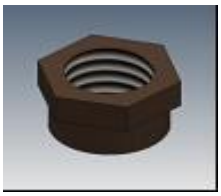
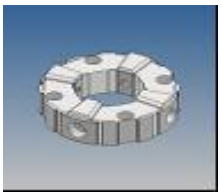
5	050300150031 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Solenoid Valves / NG6 Double Coil 4/3 AM 12V	QUANTITY	2			It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
6	050700450002 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Hydromotor / 2 Holes / Straight Shaft / OMR 200 Danfoss	QUANTITY	3		Used to rotate brushes.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
7	050300660004 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Lock Valves / 3/8" Line Type Twin Lock Valve	QUANTITY	1			It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
8	050301550004 (Consult the Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Sequence Valve / 3/8" VDSRL Pressure Sequence	QUANTITY	2			It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
9	051401360022 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Hydraulic Pumps / Gear Pumps / HDP 35.71 06S8 + PLP20.25 Tandem Pump	QUANTITY	1		It is used for hydraulic power transmission.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
10	050701650002 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Hydromotor / Axial Piston Hydromotors / F12-040-MF-IV-D-000-0000-P0 Milled	QUANTITY	1		It is used for driving the fan.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.

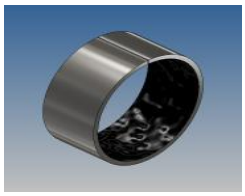
11	104301700008 (Consult to Orakçı Makina A.Ş. SSH Department)	Ready Produced Materials / Fan / LDC-020 24V DC Parker Cooler	QUANTITY	1		It provides cooling of the hydraulic system.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
12	050800650004 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Blocks / BCB Engine Rear Coupled Fan Control Block	QUANTITY	1		It controls the fan.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
13	050301640001 (Consult to Orakçı Makina A.Ş. SSH Department)	Hydraulic Materials / Valves / Or Valves / VT12 1/2" Line Type	QUANTITY	1			It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
14	105601940002 (Consult to Orakçı Makina A.Ş. SSH Department)	Ready Production Materials / Pumps / Water Pumps / UL1716I 170 Bar 16 Lpm	QUANTITY	1		It is used in manual pressure washer system.	It may be changed according to the problems that may occur in system operation. The duration varies according to operating conditions, usage and oil change.
16	Consult the Orakçı Makina A.Ş. SSH Department	PTO (Power Takeoff)	QUANTITY	1		It should be used in accordance with the PTO output of the gearbox.	May be changed in case of failures that may occur after constraining the system. The duration varies according to operating conditions, usage and oil change.

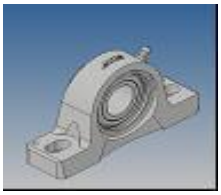
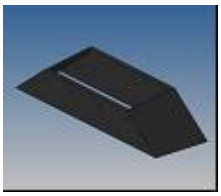
17	Consult the Orakçı Makina A.Ş. SSH Department	Hydraulic Pump Repair Kit	QUANTITY	1		Vehicle, brand, model and equipment information should be sent.	May be changed in case of failures that may occur after constraining the system. The duration varies according to operating conditions, usage and oil change.
18	050701350001	Hydraulic Materials / Hydromotor / Geared Motors / PLM20.8 R0-31S1-LEA/EA-N Equal Port	QUANTITY	1		It is used to drive the water pump.	Changes may be needed after constraining in the manual water pump or malfunctions in the hydraulic system due to burrs.
19	105701960001 (102401420003 105701960002)	Trigger Water Gun (with nozzle and gun tip)	QUANTITY	1		It is used to wash the inside of the reservoir and the operation area.	It can be damaged by impact and if it is filled with muddy water.
20	050300830011	Hydraulic Materials / Valves / Speed Regulating Valves / VPR/3/ET/V MP 1/2" 3-Way Unchecked	QUANTITY	1		It is used to adjust the speed of the tailgate.	May be changed in case of failures that may occur after constraining the system. The duration varies according to operating conditions, usage and oil change.
21	050301660003	Hydraulic Materials / Valves / Hydraulic Valves / 1/2" Three-Way Valve	QUANTITY	1		Damper or manual pressure washer is selected.	May be changed in case of failures that may occur after constraining the system. The duration varies according to operating conditions, usage and oil change.
22	051001590002	Hydraulic Drums / Water Hose Drum / 1/4" 10.5 m Pressure Water Reel with Hose	QUANTITY	1		It is used to wash the inside of the reservoir and the operation area.	It can be damaged by impact and if it is filled with muddy water.
23	057009900034	Hydraulic Materials / Tank Pass Codes-05 / Vbpsl 3/8" Pilot Operated Check Valve	QUANTITY	1			May be changed in case of failures that may occur after constraining the system. The duration varies according to

							operating conditions, usage and oil change.
24	101002320001	Hydraulic Materials / Ball Valves / 1/2" 0.5-16 Bar Brass 12V Electrical	QUANTITY	4		It controls the water collector.	It can be damaged by impact and if it is filled with muddy water.
25	050400300001	Hydraulic Materials/ Hydraulic Fittings / Manometer Fittings / Manometer Socket Fitting BSP / 1/4" M16x1.5	QUANTITY	3		It measures the oil pressure.	May be changed in case of failures that may occur after constraining the system. The duration varies according to operating conditions, usage and oil change.
26	101002320002	Hydraulic Materials / Ball Valves / 1/2" Mini Ball Valve	QUANTITY	4		It adjust the water flow.	It can be damaged by impact and if it is filled with muddy water.
27	101002320003	Hydraulic Materials / Ball Valves / 1/4" Mini Ball Valve	QUANTITY	2		It adjust the water flow.	It can be damaged by impact and if it is filled with muddy water.
28	060700180001	Pneumatic Materials / Muffler / 1/4" Sintered Muffler (Stopper type)	QUANTITY	4		It is used on pneumatic pistons.	It can be damaged if dirt or oil enters the pneumatic system.
29	060300050008	Pneumatic Materials / Pneumatic Fittings / BSP / Bend / 1/4" - 10 Pisco Bend	QUANTITY	2		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.

30	103301590060	Hoses / 6.5x10 Polyurethane Blue Hose	METER	10		It adjust the water flow.	It can be damaged by impact and if it is filled with muddy water.
31	105601940004	Pumps / Water Pumps / JABSCO 31800 – 7095T40 Water Pump	QUANTITY	1		It provides water flow.	It can be damaged by impact and if it is filled with muddy water.
32	060600170002	Pneumatic Materials / Conditioner / 1/2" MAG M FR.	QUANTITY	1		It is used for adjusting the pneumatic system.	It can be damaged if dirt or oil enters the pneumatic system.
33	060500160003	Pneumatic Materials/ Pneumatic Hoses / 4x6 European Type Black Bone Hose	METER	50		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.
34	103301590052	Ready Production Materials / Hoses / 8x10 Polyamid Black Hose	METER	15		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.
35	060700180004	Pneumatic Materials / Muffler / 3/8" Sintered	QUANTITY	10		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.
36	060300090002	Pneumatic Materials / Pneumatic Fittings / Metric / Bend / M5x6	QUANTITY	10		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.
37	060300140002	Pneumatic Materials / Pneumatic Fittings / Tee Fittings / Ø6 mm	QUANTITY	10		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.

38	060300050015	M5 - 6 Pneumatic Bend Type Speed Adjustment	QUANTITY	2		It is used in pneumatic systems.	It can be damaged if dirt or oil enters the pneumatic system.
39	050200070003	GYD 41-60 1 1/4" 340 lt/min/ Hydraulic Filters/ Return Line Filter	QUANTITY	1			Can be replaced every 750 hours or every three months.
40	050200060007	Hydraulic Filters / Suction Line Filter / 2"	QUANTITY	1		It is part of the 400 and 300 Series Tandem and Normal System Oil Tanks.	Can be replaced every 1,500 hours or every six months.
41	050200060001	Hydraulic Filters / Suction Line Filter / 1 1/2"	QUANTITY	1		400 and 300 Series Tandem and 200 series are used in all oil tanks.	Can be replaced every 1,500 hours or every six months.
42	051801490003	Hydraulic Materials / Plumbing Materials / Nozzle Group / 5/8" Tijet Injector Nozzle	QUANTITY	11		It is used for spraying water.	It can be damaged by impact and if it is filled with muddy water.
43	103301590030	Suction Hose	QUANTITY	2			It is replaced when it is punctured over time due to the suction of large wastes in the suction bucket.
44	105802060011	050H HY+ Aluminum Set Coupling	QUANTITY	1			It can be damaged if the pump or motor is forced when it is malfunctioning.
45	100400470001	M6 Grease Fittings / H1 Straight Type	QUANTITY	5			It is replaced when it gets damaged due to impact.

46	OVSALLFSMSAA030	OVS Special Fan Wheel	QUANTITY	1			It is balanced after 1000 hours of operation. It is replaced when it cannot be balanced.
47	OVSALLKSPSAA061	OVS Flap Blanket	QUANTITY	2			It is replaced when an air leakage is observed after long-term use.
48	110900110002	Plastics/Polymers/Composites / Sponges / 40/15 mm Viol 70 Dens Laminated Acoustic Foam	SQUARE METERS	12			It is replaced when it gets damaged.
49	050500160003	Indicators / Oil Level Indicators / With thermometer / 127 mm Level	QUANTITY	2			Replaced when broken.
50	103001560009	Wicks / 30x20 mm EPDM	METER	11			It is replaced when it cannot insulate sound as a result of excessive crushing and rupture and damages the engine compartment floor.
51	103001560011	Wicks / 40x30 mm EPDM	METER	10			It is replaced when it cannot insulate sound as a result of excessive crushing and rupture and damages the engine compartment floor.
52	104801830002	Side Brush	QUANTITY	10			It is checked every day and replaced when it is too worn out to fulfill its function.
53	104801830001	Square Hub Fastening Medium Brush	QUANTITY	5			It is checked every day and replaced when it is too worn out to fulfill its function.

54	101200810004	SKF SY 25 FM Ø25 mm // Bearing // Roller Bearing	QUANTITY	1			Replaced when broken.
55	102901520009	Ø20-100x25 mm / Carrier Wheel	QUANTITY	4			The bucket is changed when it gets unbalanced to the point that it touches the ground.
56	105101880001	Rubber Suction Nozzle	QUANTITY	2			The bucket is changed when it gets unbalanced to the point that it touches the ground.
	SEE THE ELECTRICITY SECTION. (Consult to Orakçı Makina A.Ş. SSH Department)	ELECTRICITY					When there are electrical failures, they are replaced with the materials located in areas shown in the electricity section.
57	030100010001	PLC PC HMI and LOGO Modules	QUANTITY	1			Replaced when there are electrical failures and the system is not operating with computer connection.
58	031600160001	Buzzer Warning Group / Reverse Gear Horn	QUANTITY	2			Replaced when broken.
59	030200020002	Relay Group / Vehicle Type Mini Relay 24 V	QUANTITY	1			Changed when there is an electrical failure.
60	030200020005	Relay Group / Vehicle Type Mini Relay 12 V	QUANTITY	3			Changed when there is an electrical failure.

61	030200020001	Vehicle Type Mini Relay Socket	QUANTITY	4			Changed when there is an electrical failure.
62	030700070072	Selector Button	QUANTITY	2			Changed when there is an electrical failure.
63	031200120023	ELS Series Water Level Sensor	QUANTITY	1			Changed when there is an electrical failure.
64	031700170029	7" Touch Screen	QUANTITY	1			Changed when there is an electrical failure.
65	031500150006	Camera with Work Lamp	QUANTITY	3			Changed when there is an electrical failure.
66	031900190001	12 V 120 Ah Battery	QUANTITY	1			Changed when there is an electrical failure.
67	030300030007	Terminal Group / Two Layered Rail Terminals	QUANTITY	5			Changed when there is an electrical failure.

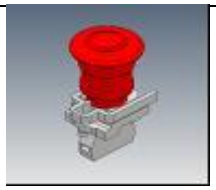
68	031100110010	White Case White Led Environmental Lighting Lamp	QUANTITY	1			Changed when there is an electrical failure.
69	031200120001	M18 SN 8 MM L 39(59) mm PNP NO Proximity Sensor	QUANTITY	2			Changed when there is an electrical failure.
70	030300030004	Phoenix FBS 2-5 3030161 Terminal Upper Bridge	QUANTITY	4			Changed when there is an electrical failure.
71	110700100006	30x30 Baffle Plate	QUANTITY	2			Changed when there is an electrical failure.
72	030700070007	Button and Contact Group / Emergency Stop Button	QUANTITY	1			Changed when there is an electrical failure.
73	030200020031	ENG 320510 12 V 100 A Relay	QUANTITY	1			Changed when there is an electrical failure.
74	032000200002	25x25 Adhesive Crochet					It is replaced when broken or lose its feature.

Table 7.1: Critical Spare Parts Table

8. ORAKÇI MAKİNA WARRANTY CONDITIONS

Orakçı Makina Products manufacturing types;

D. Product has been sub-assembled, its hydraulic and electrical installations have been prepared externally, painting has not been made (CKD products are also within this scope.)

Product has been sub-assembled, its hydraulic and electrical installations of the sub-group parts have been made, and sub-group parts have not been assembled (Products not assembled on the vehicle are within this scope.)

All sub-group assemblies and electrical and hydraulic installation of the product have been made, and painting process has also been performed (Products assembled on the vehicle by Orakçı Makina are within this scope.)

For the first product; Provided by Orakçı Makine A.Ş to its customers. For all products; on-site installation, assembly, product installation assembly and user training are provided. This protocol covers the relevant product groups specified in the contract. First product training activities defined in the Service Management Process are provided with the agreement of Orakçı Makina A.Ş and the customer.

Orakçı Makina Warranty Table;

Product Warranty Period									
DEFINITION	D			M			F		
	Product	Ready Part	YP	Product	Ready Part	YP	Product	Ready Part	YP
MINI DAMPER							1	1	10
TELESCOPIC CRANE AUTO RESCUE							1	1	10
TELESCOPIC PLATFORM PROJECT				1	1	10	1	1	10
HYDRAULIC COMPACTED GARBAGE CANS PROJECT	1	1	10	1	1	10	1	1	10
ROAD SWEEPER PROJECT WITH ON-VEHICLE VACUUM				1	1	10	1	1	10
ON-VEHICLE MINIMATIC							1	1	10
PORTABLE MINIMATIC							1	1	10

CLEANING EQUIPMENT PROJECT WITH ON-VEHICLE VACUUM							1	1	10
GARBAGE CANS PROJECT							1	1	10
JOINTED TELESCOPIC PLATFORM PROJECT				1	1	10	1	1	10
VEHICLE CARRIER / RESCUE WITH SLIDING PLATFORM							1	1	10
SINGLE ARM LOADER							1	1	10
FIXED PLATFORM							1	1	10
DOUBLE ARM LOADER							1	1	10

	D	M	F
Warranty Start	Bill of Lading/CMR Date	Bill of Lading/CMR Date	Bill of Lading/CMR Date
Warranty Scope	1) Electric, electronic system components 2) Hydraulics, pneumatics, valves, blocks.	1) Electric, electronic system components 2) Hydraulics, pneumatics, valves, blocks. 3) All welded and constructively completed areas.	1) Electric, electronic system components 2) Hydraulics, pneumatics, valves, blocks. 4) All welded and constructively completed areas. 5) Vehicle - Equipment connection points (When the equipment and vehicle assembly are performed by Orakçı Makina staff)
Situations Not Covered By The Warranty Period	1) Material damage (such as breaking, crushing, melting, rupture, tearing, burning, warping, etc.) caused by the assembly of the product without following the D	1) Material damage (such as breaking, crushing, melting, rupture, tearing, burning, warping, etc.) caused by the assembly of the product without following the M	1) Material damage (such as breaking, crushing, melting, rupture, tearing, burning, warping, etc.) caused by the assembly of the product without following the F

	assembly instructions or by incompetent staff 2) Interfering with factory default settings in electrical and/or hydraulic systems 3) Not notifying the missing, incorrect, defective/damaged parts within 15 days from the receipt of the parts shipped for the product by the customer	assembly instructions or by incompetent staff 2) Interfering with factory default settings in electrical and/or hydraulic systems 3) Not notifying the missing, incorrect, defective/damaged parts within 15 days from the receipt of the product/parts shipped with the product by the customer 4) Assembly by people who are not **authorized**[1] 5) Use and Maintenance Manual is not present with the product 6) Not performing the periodic and preventive maintenance procedures stated in the Use and Maintenance Manual according to the instructions and on time 7) Use of non-original spare parts "Except for the spare parts list" 8) Repair or maintenance by people who are not **authorized**[1] 9) Using the equipment or system other than the purpose or the matters specified in the user manual	assembly instructions or by incompetent staff 2) Interfering with factory default settings in electrical and/or hydraulic systems 3) Not notifying the missing, incorrect, defective/damaged parts within 15 days from the receipt of the product/parts shipped with the product by the customer 4) Assembly by people who are not **authorized**[1] 5) Use and Maintenance Manual is not present with the product 6) Not performing the periodic and preventive maintenance procedures stated in the Use and Maintenance Manual according to the instructions and on time 7) Use of non-original spare parts "Except for the spare parts list" 8) Repair or maintenance by people who are not **authorized**[1] 9) Using the equipment or system other than the purpose or the matters specified in the user manual 10) The carrier vehicle where the equipment is assembled is not included in Orakçı Makina Warranty Scope.

Table 8.1: Warranty Conditions Table

Authorized conditions; Authorized service conditions made between Orakçı Makina and the Customer

Providing conditions of Customer and Orakçı Makina according to the terms of the contract

	D	M	F
Service worker (Provided by; customer)	Electrician Hydraulic Technician Welding-Assembly Personnel Painting Personnel	Electrician Hydraulic Technician Welding-Assembly Personnel	Electrician Hydraulic Technician Welding-Assembly Personnel
Document (Provided by; Orakçı Makina- Implemented by; Customer)	D- Training Kit D- Assembly Project Manual D- Control Form Samples D- Spare Part List D- After Sales Flow Chart	M- Training Kit M- Assembly Project Manual M- Control Form Samples M- Spare Part List M- After Sales Flow Chart	F- Training Kit F- Assembly Project Manual F- Control Form Samples F- Spare Part List F- After Sales Flow Chart

Table 8.2: Service Condition Table

D- Training Kit
D- Manuals (Process, Assembly, User, Maintanance)
D- Spare Part List

D- After Sales Flow Chart

8.1. General Storage Conditions

- It is mandatory to comply with the product maintenance booklet and product maintenance conditions.
- If valves are not installed in the system, it must be kept in a shipment and protection status before the assembly.
- Failures resulting from impacts applied to the valve body are out of warranty.
- Changing the pressure values set by Orakçı is out of warranty.
- Product interventions made without the knowledge of Orakçı are out of warranty.

8.1.1. Storage Conditions of the Electrical Componenets

Electronic components are sensitive.

- Electronic components must be protected from contact and impact.
- Electronic components must not come into contact with water. There should be no moisture in their environment.
- They should not be directly exposed to sunlight for long period of time.
- There should be no structures with high magnetic field strength around them.
- Electronic components should be kept as shipped and in their original cans.
- The environment in which they are stored should not be dusty.
- Electronic components should not be accumulated on top of each other.
- Contact with risky objects should be avoided.

8.1.2. Storage Conditions of Hydraulic Pistons and Hydraulic Seals:

- Ideal ambient temperature for the storage conditions of the seals is room temperature.
- Seal temperature must be around 20-25°C before the assembly. Additionally, it should not be affected by direct heat sources.
- Dirt can change the mechanical properties of hydraulic seals. For this reason, the dirt must be removed before assembly and during storage.
- Seal deformation should be avoided, especially during storage. It is necessary to avoid applying force and compaction of rubber parts during storage. Forces can change the mechanical properties.
- The seals must not come into contact with solvents, oils and other fluids during storage.
- Hydraulic pistons should not be deformed.
- Hydraulic piston stages must not be open during the storage.
- Dirt, rust, etc. should not be present on the cylinder that will prevent the piston movement.
- Hydraulic pistons should not be in corrosive, oxidizing environments.
- Hydraulic pistons stages must be closed during the operations such as painting, lining, etc.
- Hydraulic pistons must not be damaged during transport and their stages must be closed while transporting.
- The seals and pistons sent must be stored in suitable storage conditions. Otherwise, they will be out of warranty.

Products sent by ORAKÇI Makine within the scope of the warranty:

1) Sequence Valves
2) Brush and Bucket Group
3) Discharge Block (Poppet-Type/Electric)
4) Hydraulic Fittings
5) Hydraulic Hoses
6) ECU
7) Electronic Switches and Buttons
8) Electrical Relays
9) Hydraulic Pistons
10) Hydraulic Tightness Components (Piston Seals, O-rings)

9. ADDITIONAL DOCUMENTS

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