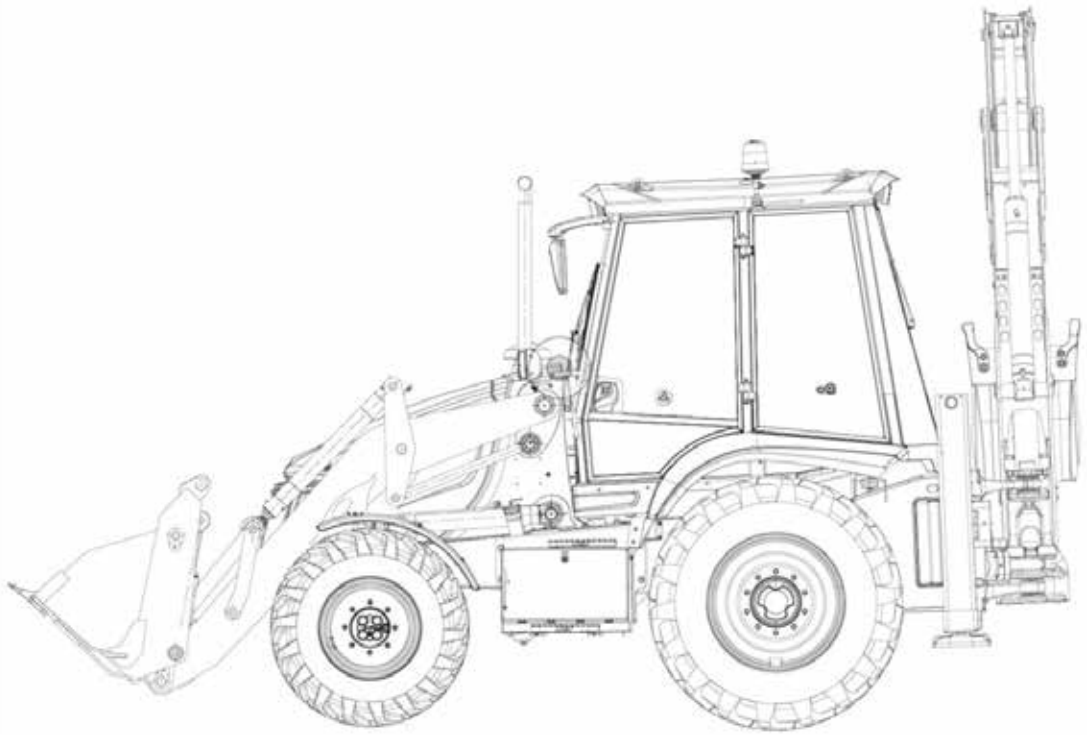
MST M544 S / M542 S

Backhoe - Loader

Maintenance and Operation Manual

Document No: 542899403



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M S T
CONSTRUCTION EQUIPMENT
YATIRIM A.Ş.

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This operating manual is prepared to help you operate your machine safely and efficiently. The manual should be carefully read before first operation. This manual cannot cover every situation that might result in an accident. It is the responsibility of the operator to always remain alert for potential hazards and be prepared to avoid them!

This manual includes information regarding machine efficiency, specification, safety and maintenance information. For this reason, it should be kept inside the cabin where it can be easily reached. If either manual becomes illegible or is missing, contact your dealer for replacements immediately.

If the machine is sold to a third party, the operating manual should also be delivered to the buyer for them to benefit from its contents.

Information, warning and rules in the manual are provided with the assumption that the users have adequate occupational experience and training. In addition to the contained information, it is essential to follow the regulations issued by the professional chambers regarding general occupational health and safety.

This operating manual is prepared to be used commonly for various models of **MST**. For this reason, there may be deviations between the provided information and visuals compared to your machine.

If you want to get detailed information in addition to the topics in the manual, you can contact **MST Customer Services** or **Authorized MST Dealers**.

MST CONSTRUCTION EQUIPMENT YATIRIM A.Ş.


4. Organize Sanayi Bölgesi GAZİANTEP/ TÜRKİYE
+90 342 211 59 00

+90 342 357 00 32
info@mst-tr.com

Alterations on Technical Documents

MST reserves the right to make changes or improvements in the design or construction of any part without incurring the obligation to install such changes on any unit previously delivered. If any alteration is made on the technical documentation of the machine after delivery, **MST** will provide updated parts of the documents if ti is required by the customer. For accurate and safe operation, the altered or updated parts of the documentation must be attached to the operator's manual.

Part Shipping Process

If you are asked to send any parts or components of the machine for repair or maintenance purposes, the address given below must be used.

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INFORMATION
You may need a qualified freight forwarder with expertise in preparing, loading and securing instruction and lifting equipment for international part or component shipment.

Some parts of the machine may still continue to operate even it has a damage. Furthermore, these parts may malfunction after a short period of time following shipping back.

Electronic parts must be packaged with anti-static bags and be placed in carton packages after including required protective supports. The electronic parts should not contact the polystyrene, foam plastic or plastic films that may produce static electric load.

For more detailed information on packaging the parts, contact with **MST Customer Services**

1 Safety Information

1.1 General Safety Information

Employer Responsibility

MST machinery are designed to prevent harm to the operator or third parties during operation and with the international safety instructions in mind.

However, even the safest machinery can pose a threat when required precautions are not taken and not applied correctly.

In addition to user training, warning signs providing easy to understand service, maintenance and safety instructions should be provided within the working site.

Design Scope

Operating the machine not in align with the remarks specified in "Design Purpose of the Machine" section may result in life threatening situations or irrevocable material damage.

Operating the machine outside the scope specified in machinery sales contract and the raw materials and operation values specified in the operation manual may result in life threatening situations or irrevocable material damage.

Equipped and Trained Operator

Information, warning and rules in the operating manual are provided with the assumption that the users have adequate occupational experience and training.

Information, warning and rules in the operating manual are provided with the assumption that the users have adequate occupational experience and training.

Work Clothes and Safety Accessories

For situations that may pose a threat, the individuals near the machine or any personal responsible for service and maintenance of the machinery should wear:

- Protective Ear Muffs
- Protective goggles
- Protective helmet
- Protective gloves
- Protective gloves

Work clothes as specified in the job description.

Changes to be made on the Machine

This machine was designed and manufactured in compliance with legal and other requirements. It cannot be modified in any way. Any modification on the machine without permission from the manufacturer may cause the machine work out of its design scope and change the warranty conditions.

Design Purpose of the Machine

MST Backhoe-Loader is a construction machine capable of conducting excavation in various types of surfaces, storing on site, banking up and loading loose or excavated material as well as levelling the surface when necessary. By attaching appropriate accessories, the machine can be used for breaking, drilling, transporting logs or lifting operations.

The Backhoe-Loader is a machine with rubber tires and main structural supports to carry shovel unloading mechanism in the front and a rear backhoe mounted at the rear of the machine.

When operating in rear backhoe mode, the machine typically performs excavation towards the machine under ground level; the backhoe is lifted and rotated sideways to unload materials while the machine remains fixed. When operating in loader mode, the machine performs loading or excavation with frontal movements to lift, move and unload material.

Passenger Transport

MST Machines are not designed for passenger transportation. Passenger transportation in or on the machine may lead to accidents that result in life loss or severe injury. Do not walk or work under elevated attachments even they are secured.

Fire Hazard

Equipment in align with the local fire regulations should be kept in the working environment and at an easily accessible locations. Inform the users regarding fire extinguishing and preventing fires or ensure they are well trained.

Selection of the Field for Machine Usage

Before operating the machine, inspect the working area closely. Take any precaution necessary against any incidents that may occur during operation.

In addition to occupational safety precautions for operating the machine in enclosed or semi enclosed environments, ensure that there is proper ventilation.

When the machine is operated, Carbon Monoxide, a colorless, odorless and poisonous gas is emitted. Inhaling the carbon monoxide gas at high volumes may lead to unconsciousness or death.

Periodic Machine Maintenance

Ensure that the inspection, maintenance and repair works on the machine are recorded in written form. Logging the periodic maintenance, service and part replacement as a list will provide ease of use if the machine is operated by another user or sold to third parties.

Original Spare Part and Accessory Usage

In order not to compromise the machine warranty and user safety, only use genuine MST spare parts and accessories. In an event of malfunction, you can contact MST authorized dealers. For potential malfunctions, service and spare parts information you can contact MST Customer Services or authorized services.

1.2 Workplace Safety

Machine's Condition

Faulty machines may cause injuries to you or to others. Do not use the machine if malfunctioning or parts missing. Make sure the maintenance procedures specified in this operation manual are completed prior to starting the machine.

Lifting Equipment

In an operation where lifting equipments are to be used, check the technical specifications of the related equipment. Before operating, ensure that the lifting equipment is in good condition. Make sure the lifting assembly is suitable for the work and complies with all domestic regulations.

Lifted Attachments

Attachments in elevated positions may fall down and cause injury. Do not pass under even secured elevated attachments.

Underground Lines and Pipes

Before working with the machine, consult the local authorities to check whether underground wirings and lines such as water, gas, telecommunication and electricity are present.

Otherwise ask for a map indicating their locations and excavate based on the recommendations of the authorities. Work with extra caution especially when operating around high voltage lines.

Even in usage of an attachment specified in technical specification section, carefully check the dimensions and take required precautions in align with these dimensions.

Engine

Do not open the hood while the engine is running. Do not use the machine with opened hood. Moving and hot parts of the engine may cause injury.

Slopes and Paths

The slopes and paths that will be utilized for work should be checked and cleaned prior to operation. Water, dirt, ice, grease or oil accumulated on slopes and paths may cause the machine to slip and lose control while operation.

Safety Barriers

Operating the machine in public places may be dangerous. Place safety barriers around the worksite to prevent unauthorized people from approaching while working in public places or limited sight. Follow the occupational health and safety instructions specified by the local authorities.

Control Levers Operation

Use the control levers only inside the cabin and in correct sitting position. Operating the control levers from outside the cabin may lead to death or serious injuries to you or others.

Sparks

During operation, sparks may be generated by the machine or its attachments. For this reason do not use the machine in working environment where flammable or combustible substances are present. Ensure that all precautions against fire are taken prior to operation even if the mentioned substances are not present at the working environment.

Line of Sight

Working with poor line of sight may lead to accidents. Use the light and keep the windows clean to increase sight clarity. Do not use the machine if you do not have a proper view of your surroundings.

Hazardous Atmosphere Areas

This machine is designed for use under normal, open space conditions. Do not use the machine in closed places with inadequate ventilation Do not use the machine in volatile environments, i.e., locations containing combustible vapor, gases or dust, without consulting an MST dealer.

Communication

Improper communication may lead to accidents. If two or more persons are working with the machine at the same time, each must be aware of the others' work. Before starting the engine, ensure that other users are not around dangerous sections..

Soft Ground

The machine may sink into soft ground. Do not work under the machine situated at soft ground

Counter Weights

Counter weights may be attached to your machine. These are extremely heavy and may alter the balance of the machine. Do not try to detach these objects.

1.3 Maintenance Safety

Modifications and Welding

Unauthorized modifications may lead to injuries and damage. Do not make any modifications on machine for any reason without informing and obtaining the approval of MST authorized service.

Safety Props

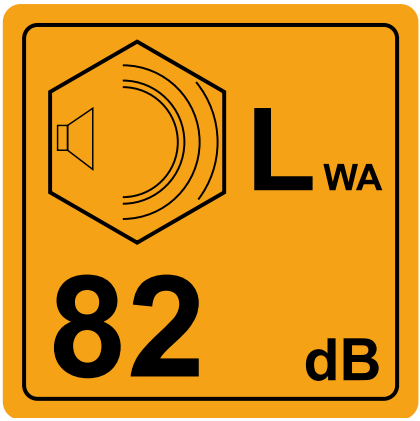
Lifted loader arms may suddenly fall and cause injuries. Attach the loader arm safety prop before working under lifted loader arms.

Hydraulic Hoses

Damaged hoses and connection components may lead to accidents resulting in death. Check the hoses regularly.

- Damaged connectors
- Damage in external surface of the hose
- Swelling in external surface
- Signs of breaking or smashing
- Penetration of external surface by protective shield
- Disengaged connectors

1.4 Labels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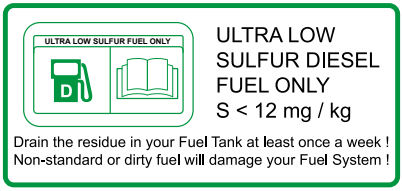
KAZICIYI ÇALIŞTIRMA-
DAN ÖNCE DENGE
AYAKLARINI ZEMİNE
BASTIRMAK ŞARTTIR.
IT IS COMPULSORY
TO SET THE
STABILIZERS
BEFORE OPERATION


ULTRA LOW SULFUR FUEL ONLY
D
ULTRA LOW
SULFUR DIESEL
FUEL ONLY
S < 12 mg / kg
Drain the residue in your Fuel Tank at least once a week !
Non-standard or dirty fuel will damage your Fuel System !

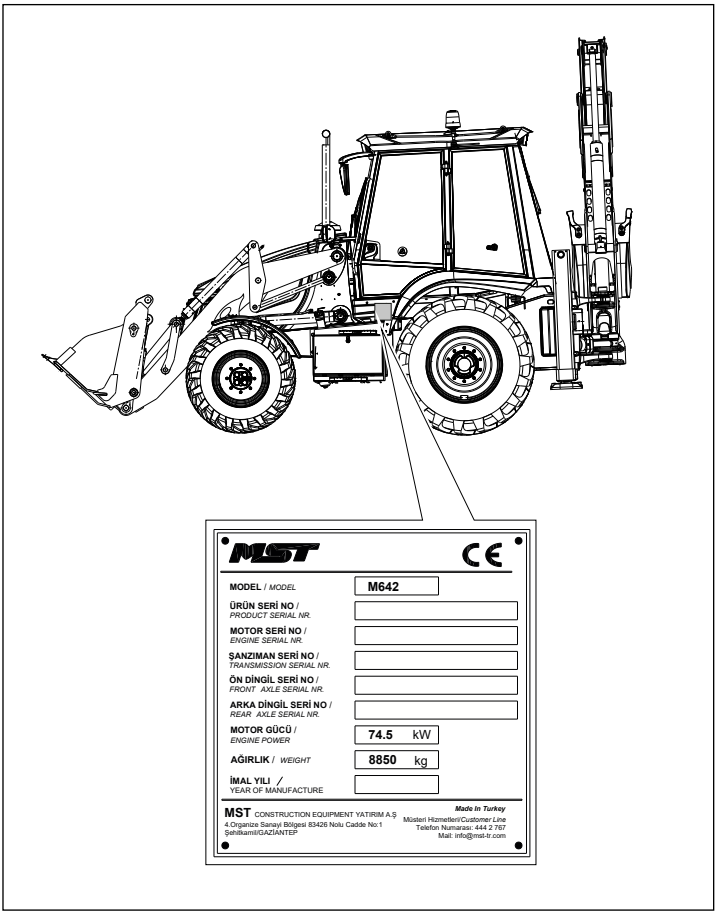
2 Technical Information

2.1 Machine Identification

Serial Number Nameplate

The serial number nameplate, located at the front left side of the machine, lists the following;

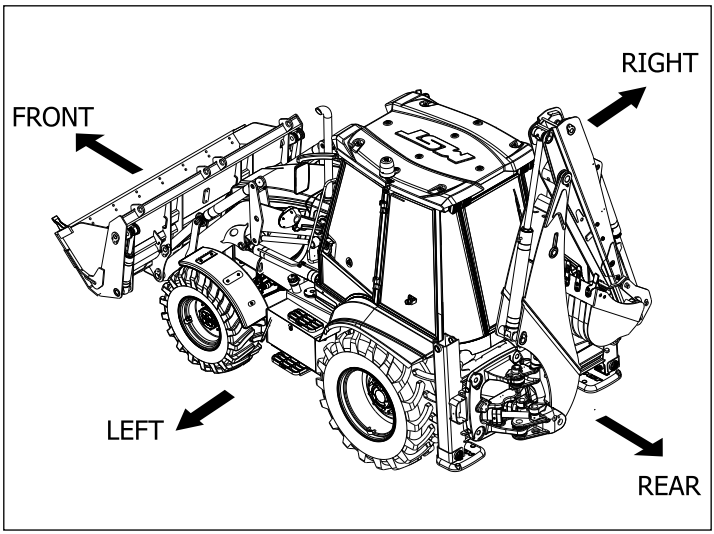
- Model Number
- Serial Number
- Engine Power
- Weight of the Machine
- Production Date



All after sales procedures are carried out with serial number of the machine.

2.2 Orientation

Right side, left side, front, and rear are directional references given from the operator's seat while facing in a forward direction.



2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
Engine Model			
Engine Manufacturer and Model		Perkins 1104C-44T	Perkins 1104C-44T
Engine Standard		TR2	TR2
Engine Net Power	kW	74,5 kW@2200rpm	74,5 kW@2200rpm
Engine Maximum Torque	Nm	408Nm@1400rpm	408Nm@1400rpm
Aspiration		Turbocharged	Turbocharged
Engine Displacement	lt	4,4	4,4
Compression Ratio		18.2:1	18.2:1
Number Of Cylinders		4	4
Cylinder Bore	mm	105	105
Stroke	mm	127	127
Rated Engine	Rpm	2200	2200
Air Filter		Dual elements, two stage, dry type	Dual elements, two stage, dry type
Cold Start		Pre-Heated	Pre-Heated
Drive Line			
Transmission Manufacturer		Carraro	Carraro
Transmission Model		TLB2 CD	TLB2 CD
Gear Selection		Powershift	Powershift
Torque Convertor Ratio		2.64 / 1	2.64 / 1
Rear PTO / Front PTO Ratio		0,804	1
Max Input Power	kW	81kW@2200 rpm	81kW@2200 rpm

2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
Max Input Torque	Nm	750	750
Max Input Speed	Rpm	2400	2400
Peak Input Speed	Rpm	3000	3000
Speed Gear		4 Fwd + 4 Rev	4 Fwd + 4 Rev
Transmission Ratio		1. gear 5.533	1. gear 5.533
		2. gear 3.359	2. gear 3.359
		3. gear 1.533	3. gear 1.533
		4. gear 0.811	4. gear 0.811
Max Speed On Road	km/h	40	40
Tyres Front		405/70-20" 12PR	16.9-28" 14PR
Tyres Front (Optional)		Not Available	Not Available
Tyres Rear		16.9-28" 14PR	16.9-28" 14PR
Rear Axle lock system		Equipped with differential lock on rear axle	Equipped with LSD (Limited Slip Differantial) on rear axle
Front axle Static Load	N	225000	250000
Front axle Dynamic Load	N	90000	100000
Rear axle Static Load	N	187500	187500
Rear axle Dynamic Load	N	75000	75000
Brake			
Service BrakeType		Hydraulic Boosted Twin Ø 31.75 Compensating self Bleed Master Cylinder	

2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
Boost Ratio		5:1	5:1
Accumulator supported for emergency braking		Available	Available
Max Operating Pressure	bar	43	38
Oil Displacement brakes actuation	cc	16+16	16+16
Max Breaking Torque	Nm	46700	37250
Park BrakeType		Rear axle input, Manually adjusted Caliper, cable operated, mounted on transmission output	
Hydraulic System (Option 1)			
Hydraulic pump Type		Tandem Gear Pump (Casappa)	Tandem Gear Pump (Casappa)
Hydraulic pump 1 displacement	cc	39,27	39,27
Hydraulic pump 1 Flow Rate	l/min	86.39 @ 2200 Rpm	86.39 @ 2200 Rpm
Hydraulic pump 2 displacement	cc	26,7	26,7
Hydraulic pump 2 Flow Rate	l/min	58.74 @ 2200 Rpm	58.74 @ 2200 Rpm
Open Centre system flow rate		145 @ 2200 Rpm	145 @ 2200 Rpm
Loader control type		Mechanic controlled by handle	
Backhoe control type		Mechanic controlled by handle	
Hydraulic system type		Open Center (Husco)	
Attachment Valve		2 section (Husco)	2 section (Husco)

2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
System Relief Pressure Pump	bar	250	250
Unloader Pressure	bar	207	207
Steering Type		Full Power Hydrostatic, Priority Valve	
Return Line Filter	µ	10	10
Suction Line Filter	µ	75	75
Hydraulic System (Option 2)			
Hydraulic pump Type		Axial Piston type with variable displacement	
Hydraulic pump Flow rate	l/min	162,8 lt/min @2200 Rpm (Rexroth)	
Piston Pump, Power Mode	Nm	210	210
Piston Pump, Eco Mode	Nm	150	150
Loader control type		Pilot oil controlled by joystick handle	
Backhoe control type		Pilot oil controlled by joystick handle	
Hydraulic system type		Closed Center (Rexroth 7SX14)	
Auxiliary Valve		1 section (Rexroth)	1 section (Rexroth)
System Relief Pressure	bar	250	250
Steering Type		Full Power Hydrostatic, Priority Valve	
Emergency Steering		Not Available / Optional	
Retrun Line Filter	µ	10	10
Suction Line Filter	µ	75	75
Electric			
Battery	A/ h	165	165
Optional Battery	A/ h	135	135

2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
Altrernator	A	85	85
Loader Performance			
Loader lift capacity at maximum height	kg	3500	3500
Loader arm Breakout Force (kgf)	kgf	5905	5905
Loader bucket Breakout Force (kgf)	kgf	7734	7734
Backhoe Performance			
Backhoe Arm Breakout Force (retracted)	kgf	3461	3461
Backhoe Arm Breakout Force (extended)	kgf	2506	2506
Bucket breakout force (speed)	kgf	5795	5795
Bucket breakout force (Power)	kgf	6424	6424
Lift Capacity of bucket pivot at full reach (retracted)	kg	1250	1250
Lift Capacity of bucket pivot at full reach (extended)	kg	750	750
Backhoe bucket capacity 35cm	m^3	0,075	0,075
Backhoe bucket capacity 40cm	m^3	0,09	0,09
Backhoe bucket capacity 50cm	m^3	0,13	0,13
Backhoe bucket capacity 60cm	m^3	0,17	0,17

2.3 Technical Information - 542/544 S TR2 Series

FEATURE	Unit	M542S 2WS TR2	M544S 4WS TR2
Backhoe bucket capacity 70cm	m³	0,2	0,2
Backhoe bucket capacity 80cm	m³	0,24	0,24
Turning Diameter Definition			
Turning Diameter Definition (braked)	m	8075	7900
Turning Diameter Definition (unbraked)	m	10000	8800
Operating Weight			
Operating Weight – Extended dipper	kg	8860	9300
Operating Weight – Fixed dipper	kg	8580	9020
Service Refill Capacities			
Fuel Tank	lt	140	140
Total Hydraulic System Volume	lt	145	145
Hydraulic Tank Volume	lt	62	62
Engine Cooling System	lt	22	22
Engine Oil with Filter	lt	8,5	8,5
Differential Oil of the Front Axle	lt	7,5	8,5
Differential Oil of the Rear Axle	lt	16	9
Front axles pins	lt	2 x 0,80	2 x 1,3
Rear axles pins	lt	2 x 1,5	2 x 1,5
Transmission	lt	21	21

2.4 Technical Information - 542/544 S TR3 Series

FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Engine Model			
Engine Manufacturer and Model		Perkins 1104D-44TA	Perkins 1104D-44TA
Engine Standard		TR3A	TR3A
Engine Net Power	kW	74,5 kW @ 2200 RPM	74,5 kW @ 2200 RPM
Engine Maximum Torque	Nm	400Nm @1400 RPM	400Nm @1400 RPM
Aspiration		Turbocharged	Turbocharged
Engine Displacement	lt	4,4	4,4
Compression Ratio		18.2:1	18.2:1
Number Of Cylinders		4	4
Cylinder Bore	mm	105	105
Stroke	mm	127	127
Rated Engine	Rpm	2200	2200
Air Filter		Dual elements, two stage, dry type	Dual elements, two stage, dry type
Cold Start		Pre-Heated	Pre-Heated
Drive Line			
Transmission Manufacturer		Carraro	Carraro
Transmission Model		TLB2 SD	TLB2 SD
Gear Selection		Powershift	Powershift
Torque Converter Ratio		2.64 / 1	2.64 / 1
Rear PTO / Front PTO Ratio		0,804	1
Max Input Power	kW	81kW@2200 rpm	81kW@2200 rpm
Max Input Torque	Nm	750	750

2.4 Technical Information - 542/544 S TR3 Series

FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Max Input Speed	Rpm	2400	2400
Peak Input Speed	Rpm	3000	3000
Speed Gear		4 Fwd + 4 Rev	4 Fwd + 4 Rev
Transmission Ratio		1. gear 5.533	1. gear 5.533
		2. gear 3.359	2. gear 3.359
		3. gear 1.533	3. gear 1.533
		4. gear 0.811	4. gear 0.811
Max Speed On Road	km/h	40	40
Tyres Front		405/70-20" 12PR	16.9-28" 14PR
Tyres Front (Optional)		Not Available	Not Available
Tyres Rear		16.9-28" 14PR	16.9-28" 14PR
Rear Axle lock system		Equipped with differential lock on rear axle	Equipped with LSD on rear axle
Front axle Static Load	N	225000	250000
Front axle Dynamic Load	N	90000	100000
Rear axle Static Load	N	187500	187500
Rear axle Dynamic Load	N	75000	75000
Brake			
Service Brake Type		Hydraulic Boosted Twin Ø 31.75 Compensating self Bleed Master Cylinder	
Boost Ratio		5:1	5:1
Accumulator supported for emergency braking		Available	Available

2.4 Technical Information - 542/544 S TR3 Series

FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Max Operating Pressure	bar	43	38
Oil Displacement brakes actuation	cc	16+16	16+16
Max Breaking Torque	Nm	46700	37250
Park Brake Type		Rear axle input, Manually adjusted Caliper, cable operated, mounted on transmission output	
Hydraulic System (Option 1)			
Hydraulic pump Type		Tandem Gear Pump (Casappa)	Tandem Gear Pump (Casappa)
Hydraulic pump 1 displacement	cc	39,27	39,27
Hydraulic pump 1 Flow Rate	l/min	86.39 @ 2200 Rpm	86.39 @ 2200 Rpm
Hydraulic pump 2 displacement	cc	26,7	26,7
Hydraulic pump 2 Flow Rate	l/min	58.74 @ 2200 Rpm	58.74 @ 2200 Rpm
Open Centre system flow rate		145 @ 2200 Rpm	145 @ 2200 Rpm
Loader control type		Mechanic controlled by joystick handle	
Backhoe control type		Pilot oil controlled by joystick handle	
Hydraulic system type		Open Center (Husco)	Open Center (Husco)
Attachment Valve		2 section (Husco)	2 section (Husco)
System Relief Pressure Pump	bar	240	240
Unloader Pressure	bar	207	207

2.4 Technical Information - 542/544 S TR3 Series

FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Steering Type		Full Power Hydrostatic, Priority Valve	
Return Line Filter	µ	10	10
Suction Line Filter	µ	75	75
Hydraulic System (Option 2)			
Hydraulic pump Type		Axial Piston type with variable displacement	
Hydraulic pump Flow rate	l/min	162,8 lt/min @2200 Rpm (Rexroth)	
Piston Pump, Power Mode	Nm	210	210
Piston Pump, Eco Mode	Nm	150	150
Loader control type		Pilot oil controlled by joystick handle	
Backhoe control type		Pilot oil controlled by joystick handle	
Hydraulic system type		Closed Center (Rexroth 7SX14)	
Auxiliary Valve		1 section (Rexroth)	1 section (Rexroth)
System Relief Pressure	bar	240	240
Steering Type		Full Power Hydrostatic, Priority Valve	
Emergency Steering		Not Available / Optional	
Retrun Line Filter	µ	10	10
Suction Line Filter	µ	75	75
Electric			
Battery	A/ h	165	165
Optional Battery	A/ h	135	135
Alternator	A	85	85

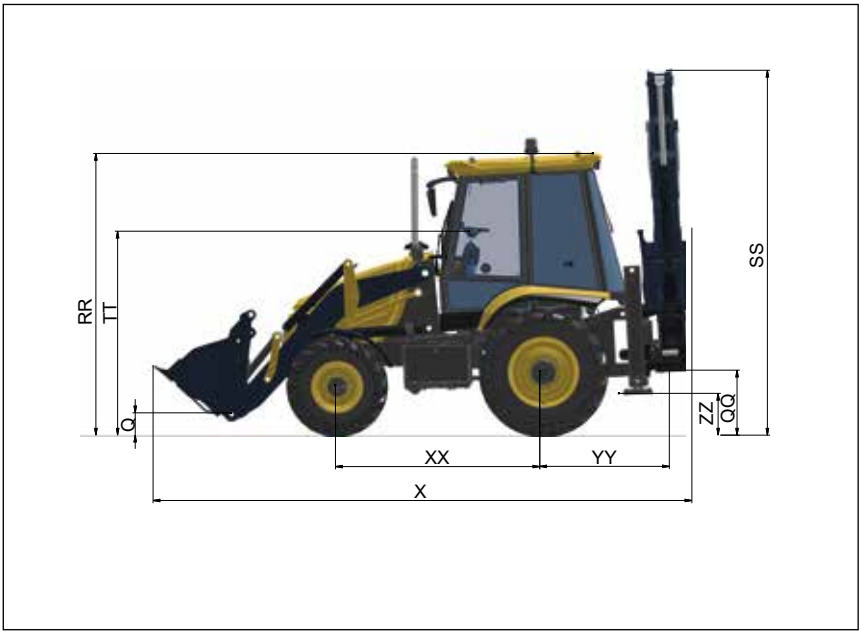
2.4 Technical Information - 542/544 S TR3 Series

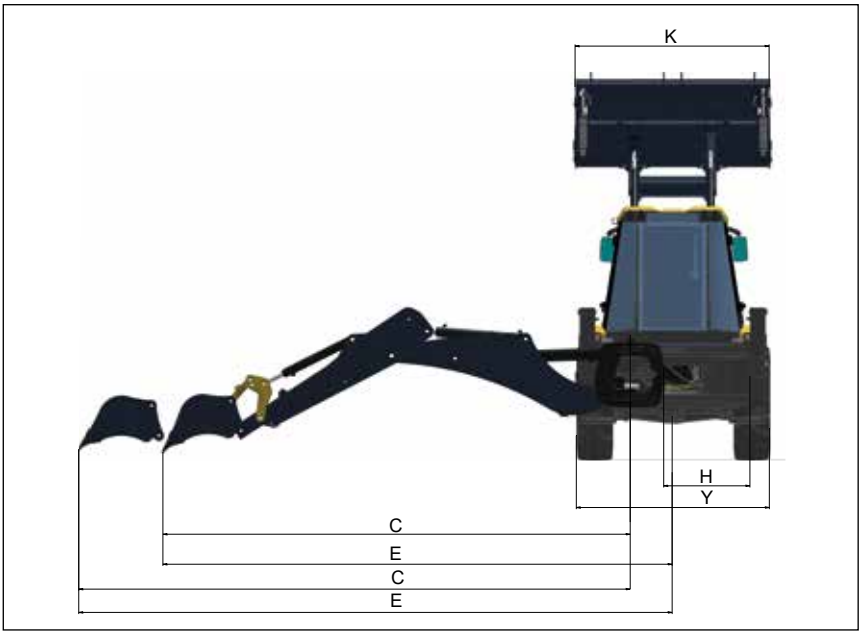
FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Loader Performance			
Loader lift capacity at maximum height	kg	3500	3500
Loader arm Breakout Force (kgf)	kgf	5905	5905
Loader bucket Breakout Force (kgf)	kgf	7734	7734
Backhoe Performance			
Backhoe Arm Breakout Force (retracted)	kgf	3461	3461
Backhoe Arm Breakout Force (extended)	kgf	2506	2506
Bucket breakout force (speed)	kgf	5795	5795
Bucket breakout force (Power)	kgf	6424	6424
Lift Capacity of bucket pivot at full reach (retracted)	kg	1250	1250
Lift Capacity of bucket pivot at full reach (extended)	kg	750	750
Backhoe bucket capacity 35cm	m^3	0,075	0,075
Backhoe bucket capacity 40cm	m^3	0,09	0,09
Backhoe bucket capacity 50cm	m^3	0,13	0,13
Backhoe bucket capacity 60cm	m^3	0,17	0,17

2.4 Technical Information - 542/544 S TR3 Series

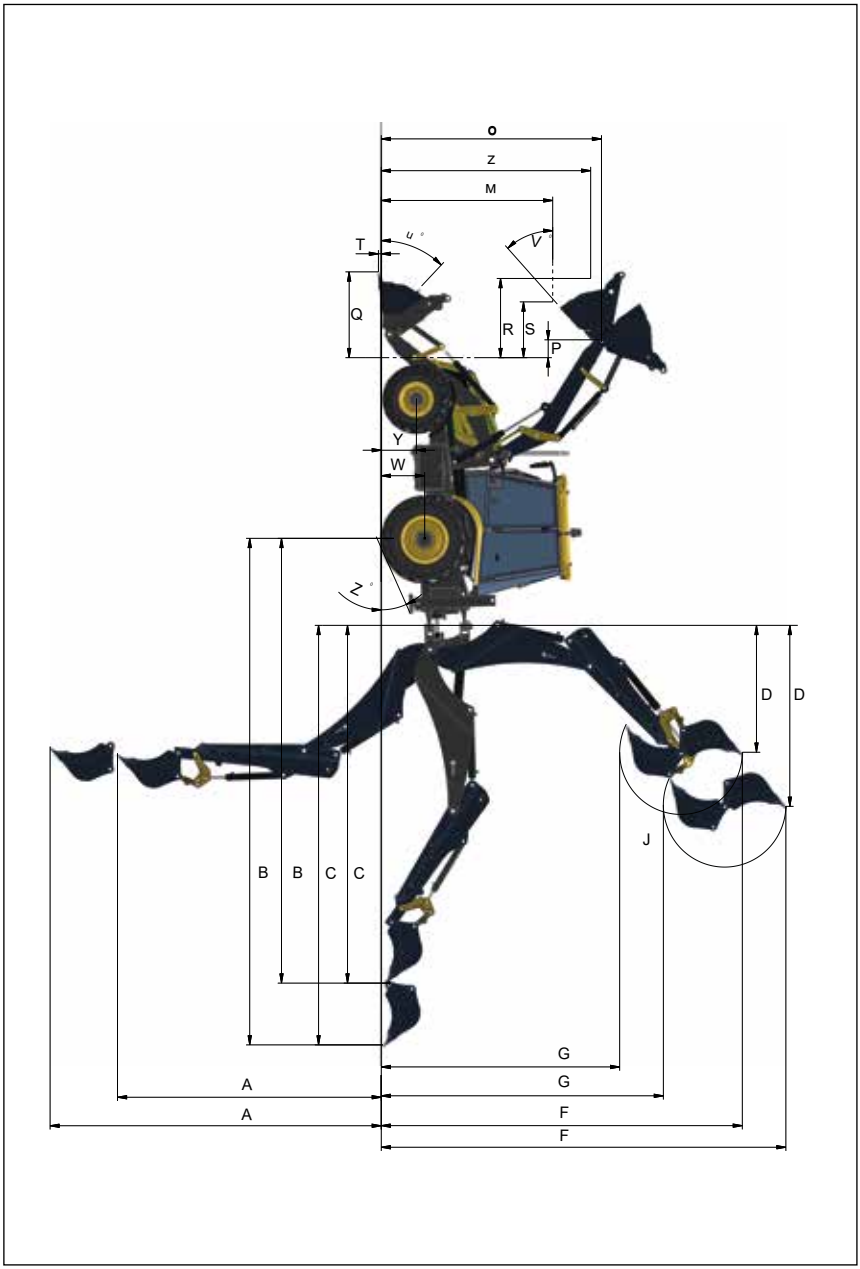
FEATURE	Unit	M542 S 2WS TR3A	M544 S 4WS TR3A
Backhoe bucket capacity 70cm	m^3	0,2	0,2
Backhoe bucket capacity 80cm	m^3	0,24	0,24
Turning Diameter Definition			
Turning Diameter Definition (braked)	m	8075	7900
Turning Diameter Definition (unbraked)	m	10000	8800
Operating Weight			
Operating Weight – Extended dipper	kg	8860	9300
Operating Weight – Fixed dipper	kg	8580	9020
Service Refill Capacities			
Fuel Tank	lt	140	140
Total Hydraulic System Volume	lt	145	145
Hydraulic Tank Volume	lt	62	62
Engine Cooling System	lt	19	19
Engine Oil with Filter	lt	8,5	8,5
Differential Oil of the Front Axle	lt	7,5	8,5
Differential Oil of the Rear Axle	lt	16	9
Front axles pins	lt	2 x 0,80	2 x 1,3
Rear axles pins	lt	2 x 1,5	2 x 1,5
Transmission	lt	21	21

2.5 Dimensions - 542 S Series





2.5 Dimensions - 542 S Series



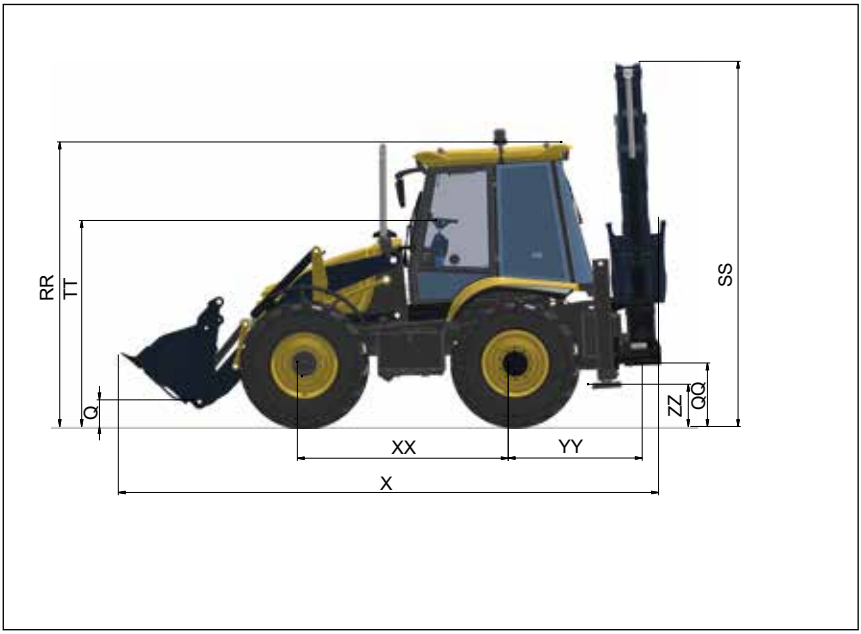
2.5 Dimensions - 542 S Series

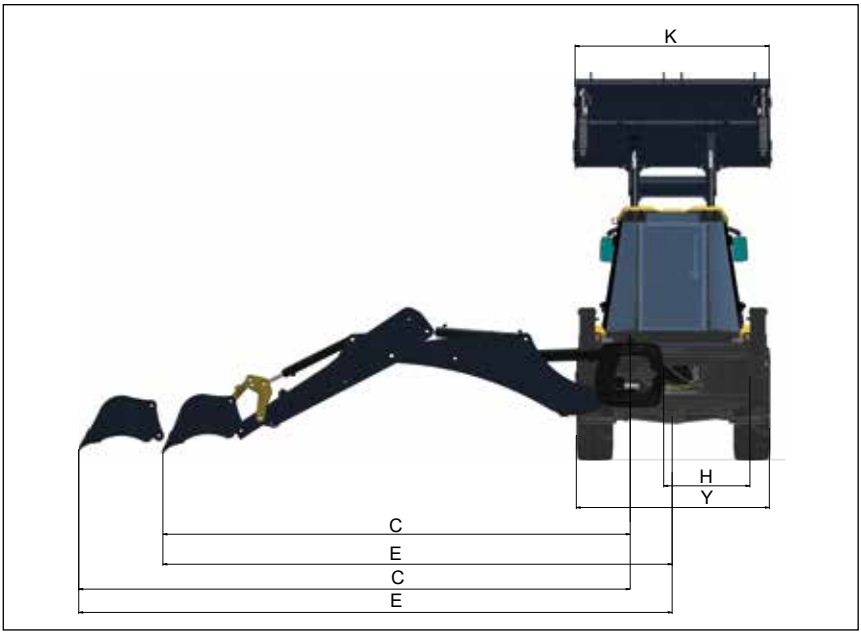
	Dimension	Unit	Fixed dipper	TB Extend.	TB Retr.
A	SAE Maximum dig depth	mm	4075	5350	4255
A	Maximum dig depth	mm	4575	5850	4755
B	Reach - ground level to rear wheel centre	mm	6866	8027	7026
C	Reach - ground level to slew center	mm	5480	6641	5640
D	Reach - at full high to slew center	mm	1727	2776	1936
E	Side reach –to center line of machine	mm	6005	7149	6147
F	SAE operating height	mm	5509	6347	5653
G	Max loadover height	mm	3764	4623	3912
J	Bucket rotation	°	205		
K	Shovel Width	mm	2350		
Y	Rear frame width	mm	2250		
SS	Total travel clearance	mm	3838		
QQ	Kingpost clearance	mm	542		
Z	Departure angle	°	19		
ZZ	Stabilizer feet clearance	mm	338		
YY	Slew center to rear axle center distance	mm	1388		
XX	Axle centreline distance	mm	2237		
X	Total travel length	mm	5740		
TT	Steering wheel center height	mm	2057		
RR	Cab roof height	mm	2970		
P	Pin forward reach	mm	377		

2.5 Dimensions - 542 S Series

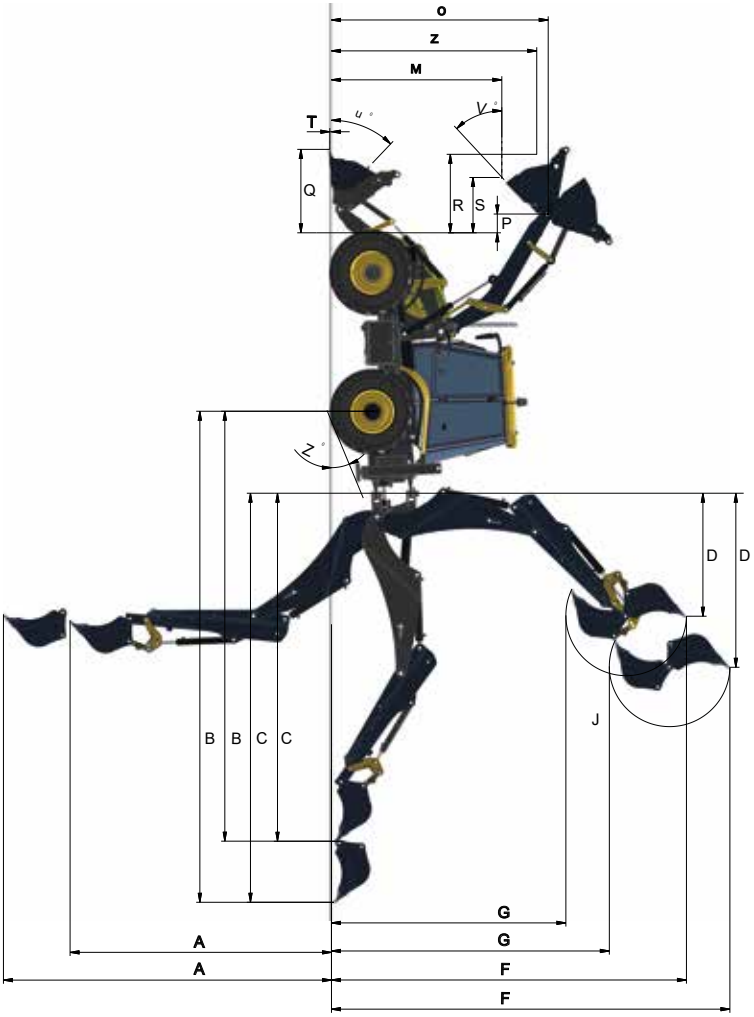
	Dimension	Unit	Fixed dipper	TB Extend.	TB Retr.
S	Reach at full height fully dumped	mm	900		
R	Max. reach at full height	mm	1124		
V	Dump angle	°	43		
M	Dump height	mm	2800		
N	Load over height	mm	3328		
O	Loader hinge pin height	mm	3481		
U	Roll back at ground	°	44		
T	Dig depth	mm	124		
Q	Reach at ground (toe plate horizontal)	mm	1317		
H	Total kingpost travel	mm	1125		
W	Rear wheel center to ground	mm	643		
L	Front wheel center to ground	mm	496		

2.6 Dimensions - 544 S Series





2.6 Dimensions - 544 S Series



2.6 Dimensions - 544 S Series

	Dimension	Unit	Fixed dipper	TB Extend.	TB Retr.
A	SAE Maximum dig depth	mm	4020	5310	4215
A	Maximum dig depth	mm	4520	5810	4715
B	Reach - ground level to rear wheel center	mm	6830	7990	6990
C	Reach - ground level to slew center	mm	5480	6641	5640
D	Reach - at full high to slew center	mm	1724	2776	1936
E	Side reach –to center line of machine	mm	6005	7149	6147
F	SAE operating height	mm	5568	6406	5696
G	Max loadover height	mm	3824	4680	3971
J	Bucket rotation	°	205		
K	Shovel Width	mm	2350		
Y	Rear frame width	mm	2250		
SS	Total travel clearance	mm	3864		
QQ	Kingpost clearance	mm	591		
Z	Departure angle	°	21		
ZZ	Stabilizer feet clearance	mm	363		
YY	Slew center to rear axle center distance	mm	1380		
XX	Axle centreline distance	mm	2300		
X	Total travel length	mm	5740		
TT	Steering wheel center height	mm	2148		
RR	Cab roof height	mm	3000		
P	Pin forward reach	mm	413		

2.6 Dimensions - 544 S Series

	Dimension	Unit	Fixed dipper	TB Extend.	TB Retr.
S	Reach at full height fully dumped	mm	935		
R	Max. reach at full height	mm	1260		
V	Dump angle	°	43		
M	Dump height	mm	2810		
N	Load over height	mm	3338		
O	Loader hinge pin height	mm	3491		
U	Roll back at ground	°	44		
T	Dig depth	mm	115		
Q	Reach at ground (toe plate horizontal)	mm	1340		
H	Total kingpost travel	mm	1125		
W	Rear wheel center to ground	mm	643		
L	Front wheel center to ground	mm	643		

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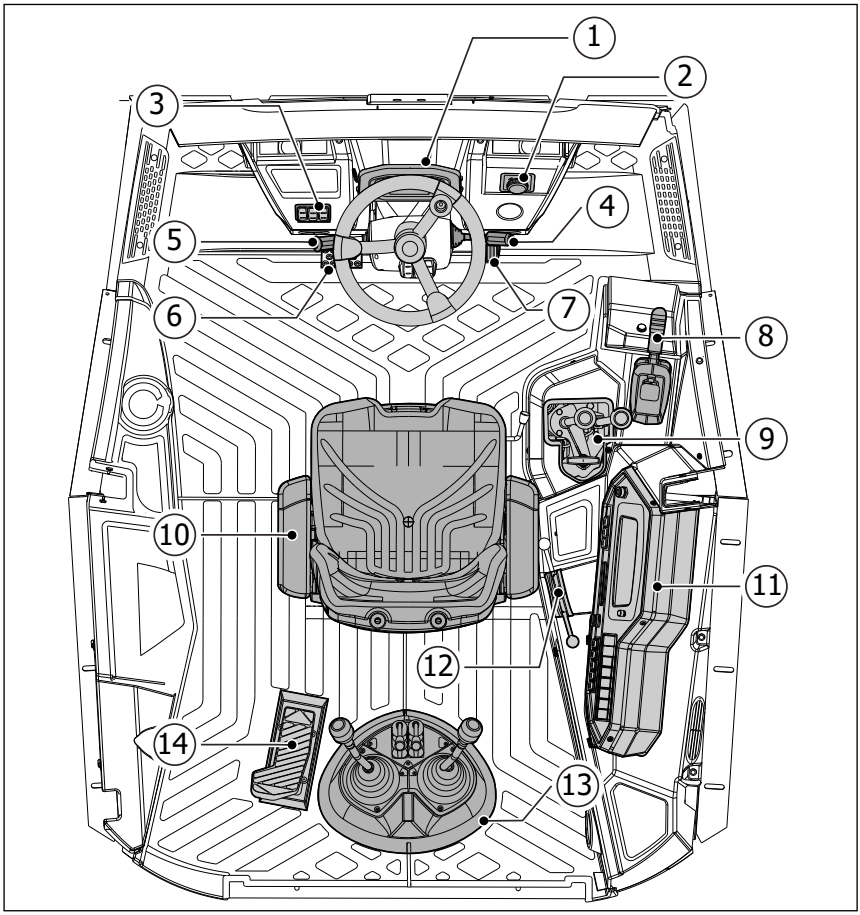
3 Machine Information

3.1 Operator Cab (Lever Type)



1-) Instrument Panel

2-) Menu Button

3-) Button Group

4-) Signal Arm / Windshield Wiper

5-) Gear Selection Arm

6-) Brake Pedal

7-) Acceleration Pedal

8-) Parking Brake

9-) Loader Control Levers

10-) Operator's Seat

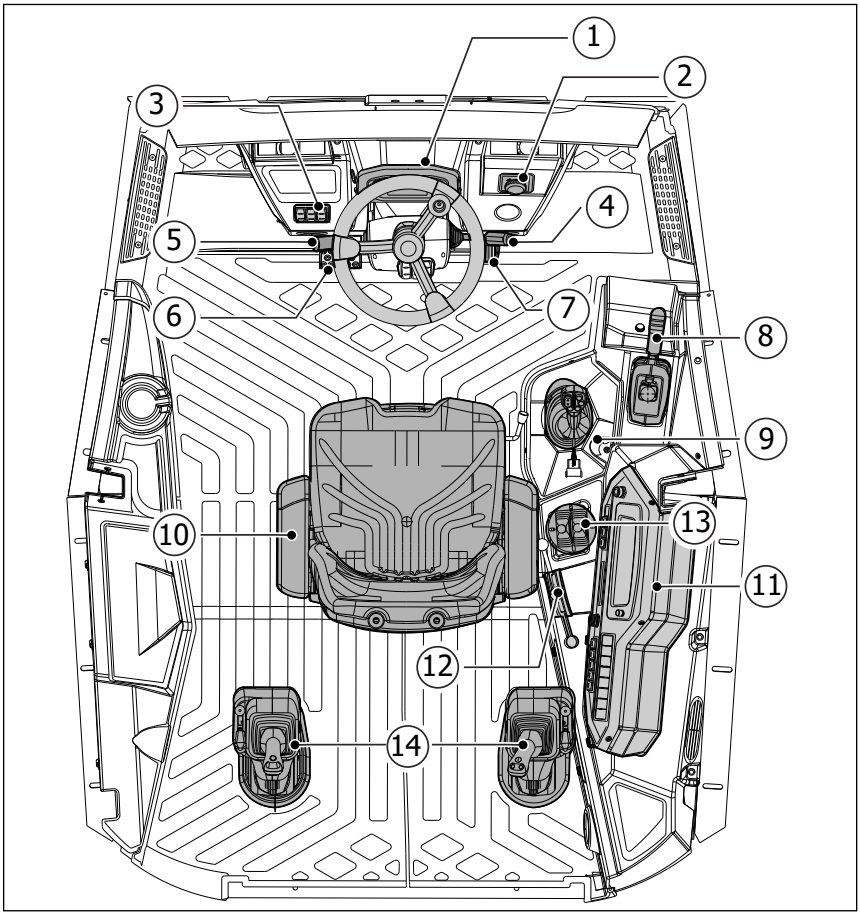
11-) Side Control Panel

12-) Throttle Valve

13-) Backhoe Control Levers

14-) Telescopic Move/Breaker Pedal

3.1 Operator Cab (Joystick Type)



1-) Instrument Panel

2-) Menu Button

3-) Button Group

4-) Signal Arm / Windshield Wiper

5-) Gear Selection Arm

6-) Brake Pedal

7-) Acceleration Pedal

8-) Parking Brake

9-) Loader Control Joystick

10-) Operator's Seat

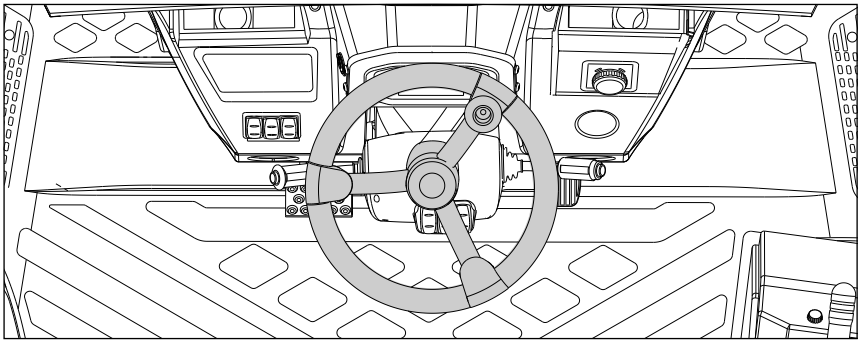
11-) Side Control Panel

12-) Throttle Valve

13-) Stabilizer Levers

14-) Backhoe Control Joystick

3.1.1 Steering Wheel



Hydraulic steering wheel is energized with a pump to help you guide the machine. If the pump does not work or the system has a malfunction, the machine can be guided but would require more effort.

If you feel a difference in strength to be applied for steering during operation, we recommend contacting MST service for checking the hydraulic steering wheel system.

⚠ DANGER

Do not hold the steering wheel at maximum stance (full right or full left) more than 5 seconds when the engine is running. This could damage the pump.

⚠ WARNING

If the machine is parked at cold weather (below -10°C) for an extended period of time, the hydraulic steering wheel controls would require more effort. This is due to an increased viscosity of the hydraulic fluid exposed to cold weather and does not indicate a malfunction. If this happens, press the gas pedal until the engine speed reaches 1500 rpm and leave the pedal or run the engine at idle for 2 to 3 minutes to heat the hydraulic fluid.

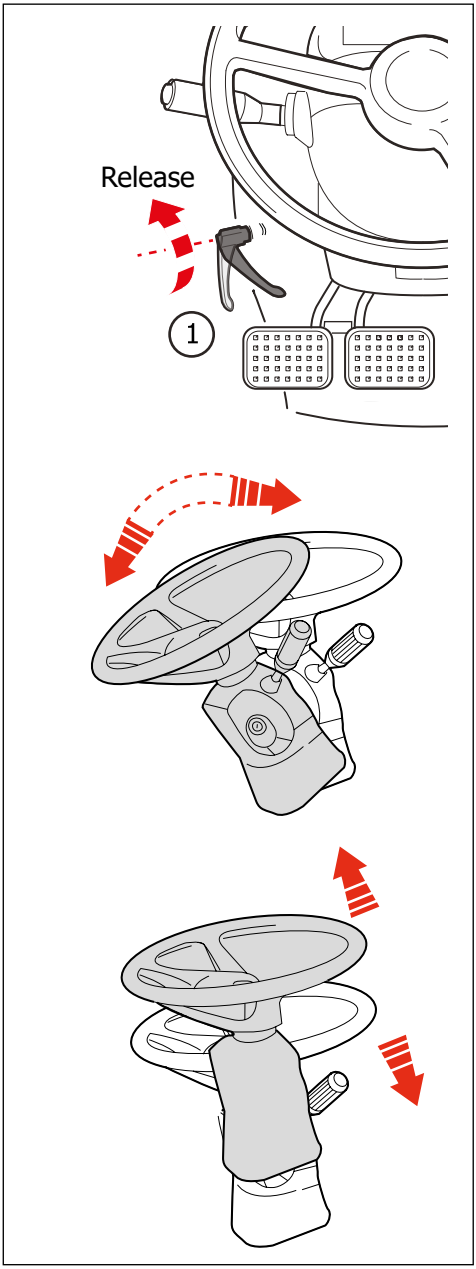
⚠ WARNING

This machine has three steering modes. Please understand the principles of driving modes before operating the machine.

3.1.2 Steering Wheel Adjustment

The steering wheel could be adjusted to more ergonomic driving and to be able to see the warning lights and indicators on the indicator panel.

To change the steering wheel column angle, turn the adjustment handle (1) counter clockwise and release the steering wheel. When the steering wheel is at desired angle, turn the arm clockwise to lock it. Adjust the steering wheel column at desired location prior to operation.

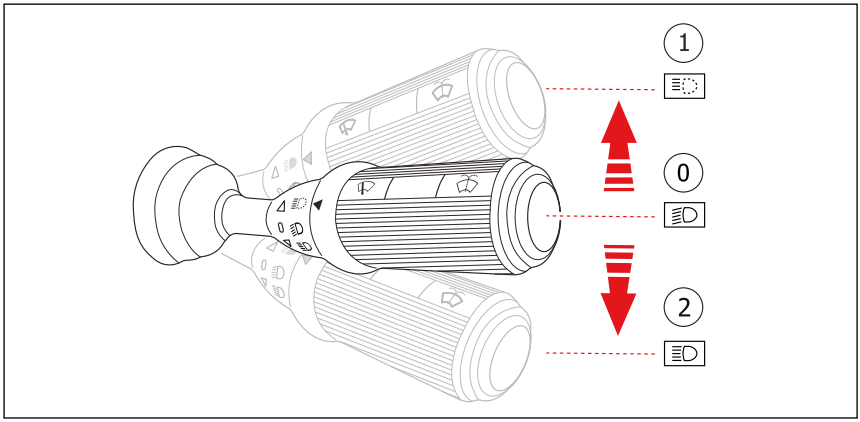


DANGER

Do not adjust the angle and height of the steering wheel while vehicle is moving. You can loose control of the steering and lead to serious injury or accidents.

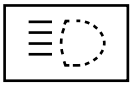
After adjusting the steering wheel, move the steering wheel up and down to ensure it is secured on its place.

3.1.3 Turning Signal Lever



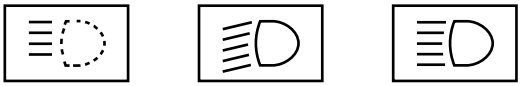
Headlamp Flasher

(1) To flash the headlights, lift the arm. Headlight flashing function is only available when the ignition is at "I".

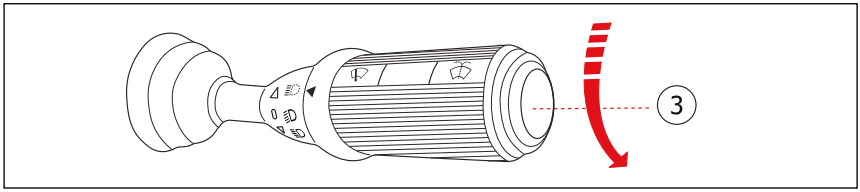


High Beam Headlights

(2) To light the high beam headlights, push the arm down. When the arm is at central position, only low beam headlights are illuminated. High beam headlights are only functional when main beams are enlightened.



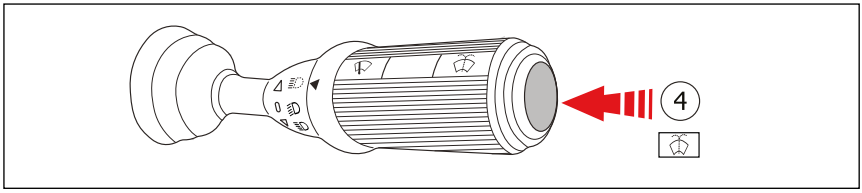
Windshield Wipers



To operate the windshield wipers, turn the arm clockwise.

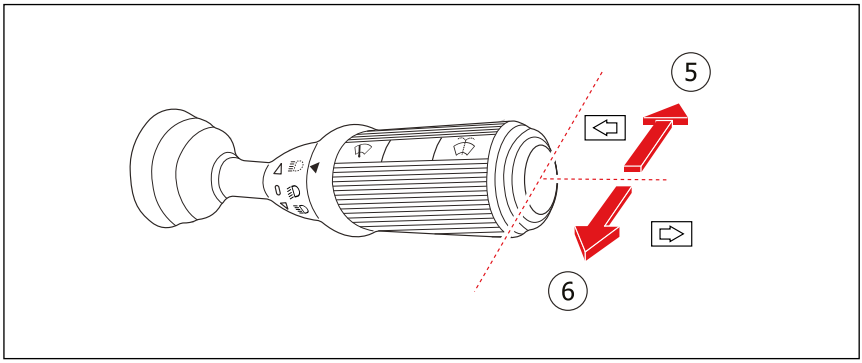
(3)

J	:	Intermittent Wipe	**I**	:	Wiping
0	:	Closed	**II**	:	Fast Wiping

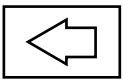


4 To operate the windshield water sprayer press the button. Water spraying function is only available when the ignition is at "I".

Turning Signal (LH)

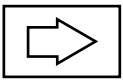


5 Push the arm away from yourself to engage left turn blinker. After completing the turn, pull the arm to its central position



Turning Signal (RH)

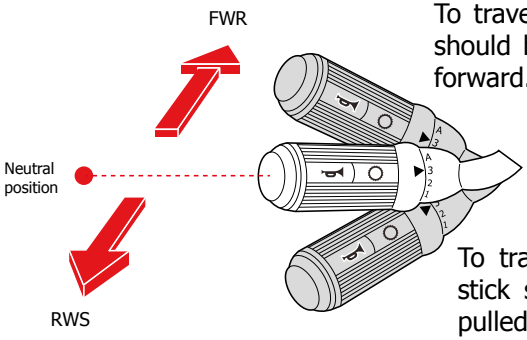
6 Pull the arm towards yourself to engage right turn blinker. After completing the turn, push the arm to its central position.



3.1.4 Gear Selector

Direction of Travel Selection

Forward and Reverse movement is selected via the gear selection stick. When the gear stick is centered, it is at neutral. Machine could only be started at neutral position.



To travel forward, the gear stick should be pulled up and pushed forward.

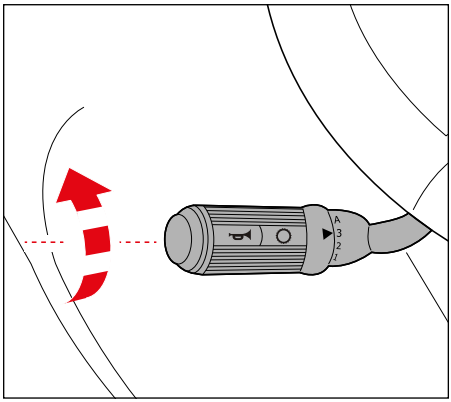
To travel backwards, the gear stick should be pulled up and pulled backwards (towards yourself).

INFORMATION

The machine should be started when the gear stick is at neutral position. When you want to change the direction of travel always:

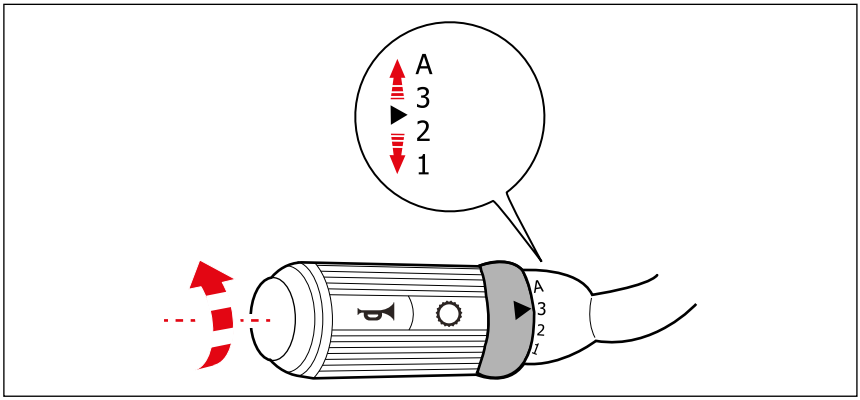
- Stop the vehicle completely
- Check the vehicle surroundings.

Gear Selection



To select a speed, turn the gear selector. The arrow marked on the gear selector indicates the current speed.

A: Auto Mode/4th Speed
1: (Manual) 1st Speed
2: (Manual) 2nd Speed
3: (Manual) 3rd Speed



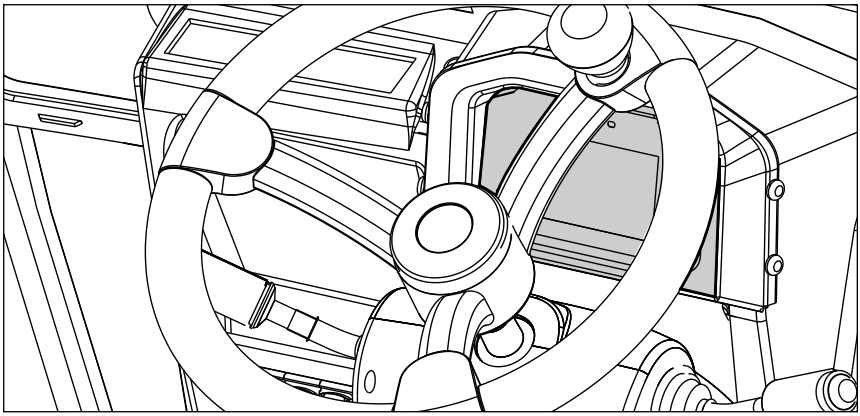
When the gear selector is at **A** position, it is operated like an automatic transmission. If the engine speed changes the gears are engaged accordingly, automatically.

When the gear selector is at **1, 2** and **3** position, the transmission operates in manual mode. In this mode, the gears should be shifted manually according to the engine speed.

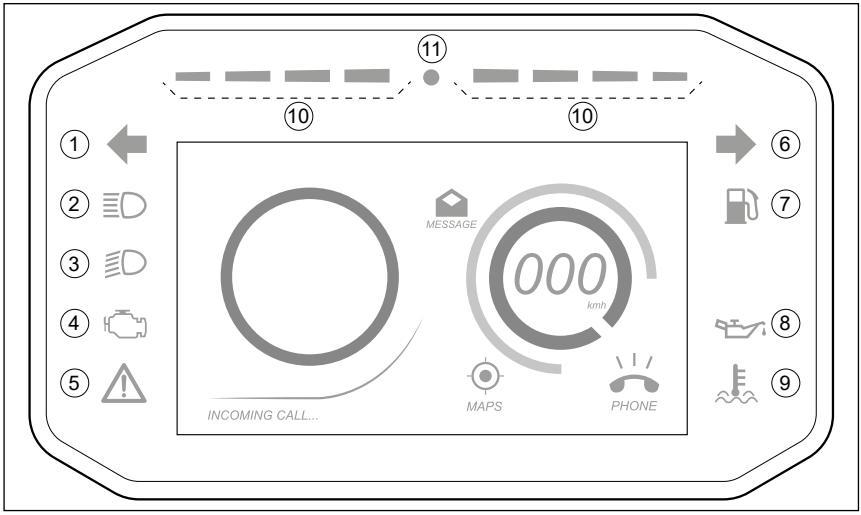
For shifting to 4th speed you have to increase the engine speed and to switch from 3rd to A position.

⚠ WARNING
When the vehicle is operated at manual gear mode, check the engine noise and the rpm indicator regularly. To save fuel, ensure that the machine does not exceed 2200 rpm. As the engine speed increase, shift to a higher gear.

3.1.5 Front Indicator Panel

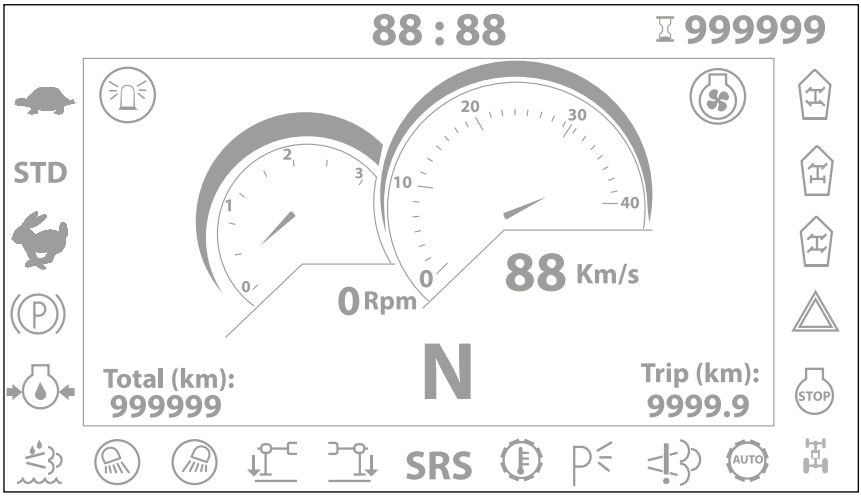


Main Screen

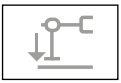
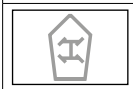
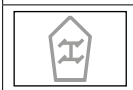
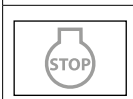
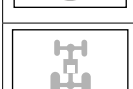


1:	Left Turn
2:	High Beam
3:	Low Beam
4:	Engine Warning
5:	Maintenance Warning
6:	Right Turn

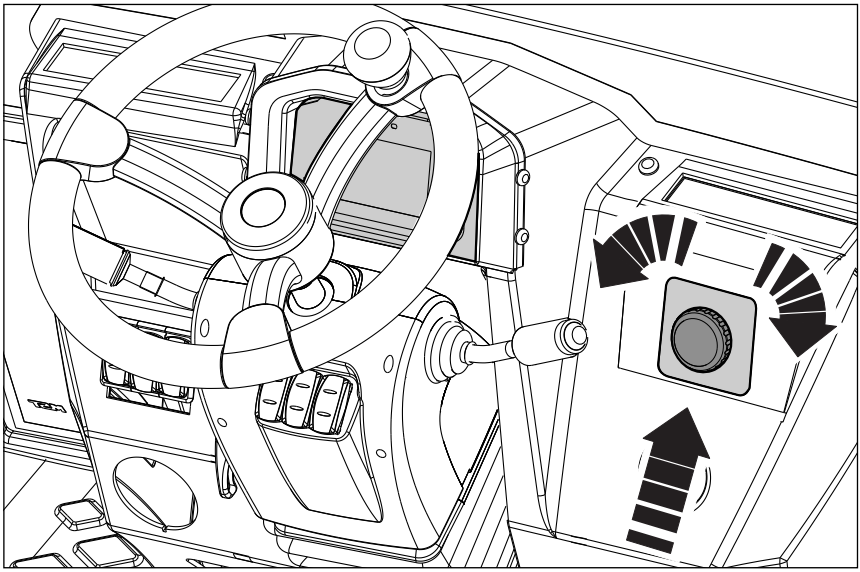
7:	Low Fuel Warning
8:	Transmission Oil Pressure Warning
9:	Engine Coolant High Warning
10:	LED Bar Graph



	Slow Mode	Indicates that the slow operating mode is activated.
STD	**Standard Mode**	Indicates that the standard operating mode is activated.
	Fast Mode	Indicates that the slow operating mode is activated.
	Park Brake	Indicates that the parking brake is activated.
	Engine Oil Pressure	Indicates that the engine oil pressure is extremely low.
	Low DEF Warning	Indicates that the parking brake is activated.
	Rear Work Lamp	Indicates that the rear work lamp is activated.
	Front Work Lamp	Indicates that the front work lamp is activated.

	**Left Stabilizer**	Indicates that the left stabilizer is activated.
	**Right Stabilizer**	Indicates that the right stabilizer is activated.
	**Smooth Riding System**	Indicates that SRS is activated.
	**Transmission Oil Temperature**	Indicates that the transmission oil temperature is extremely high.
	**Parking Lights**	Indicates that the left stabilizer is activated.
	**Emission System Failure**	Indicates that the emission system is malfunctioning.
	**Auto OFF**	Indicates that automatic transmission mode is deactivated.
	**4W Steering**	Indicates that the 4W steering mode is activated.
	**2W Steering**	Indicates that the 2W steering mode is activated.
	**Crab Steering**	Indicates that the crab steering mode is activated.
	**Hazard Warning**	Indicates that hazard warning flasher is activated.
	**Engine Stop**	Indicates that engine system malfunctioning. Stop engine immediately.
	**4WD**	Indicates that 4WD mode is activated.
	**Beacon**	Indicates that beacon light is activated.
	**Reverse Fan**	Indicates that reverse fan is activated.

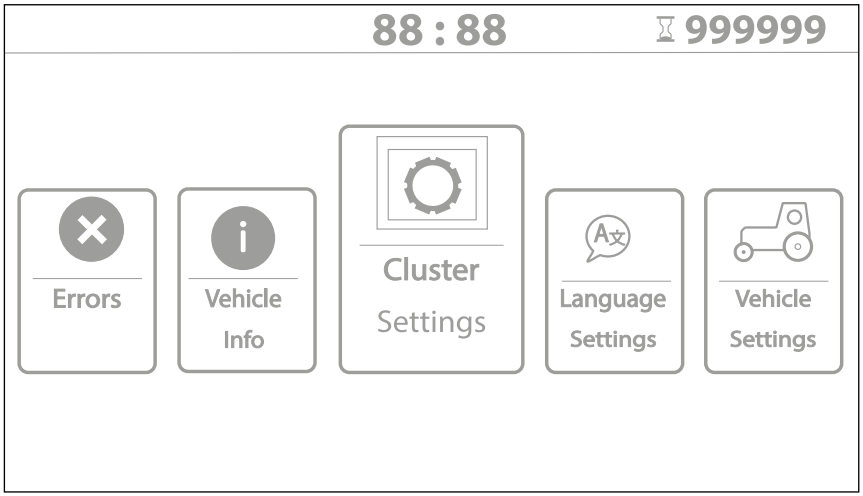
Menu Button



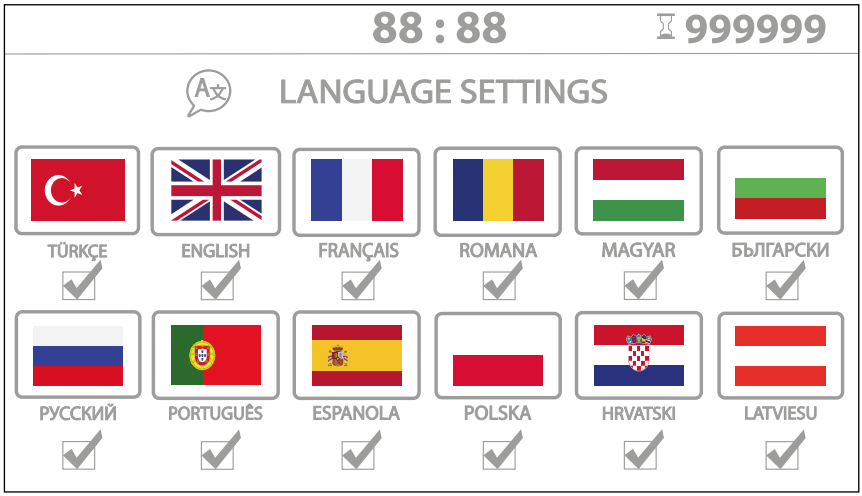
Rotate the menu button to left or right to select the sub screen and press onto button.

Pull the button towards you to return to the previous page.

Main Menu

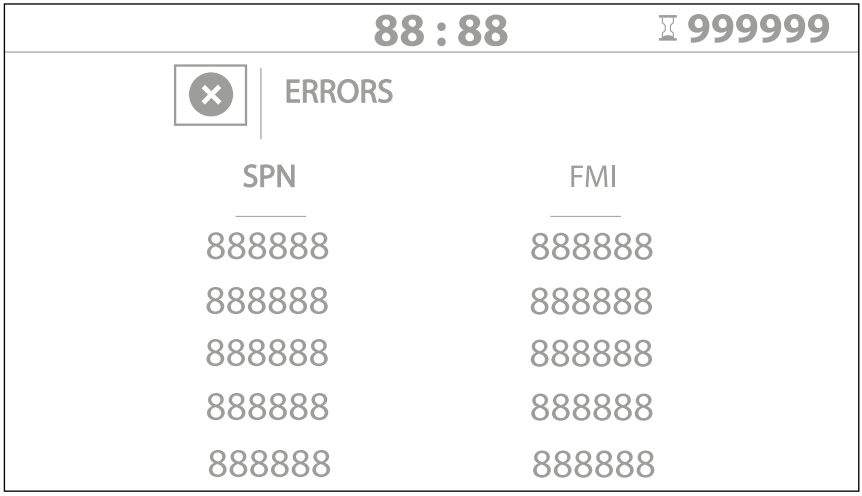


Language Settings Screen



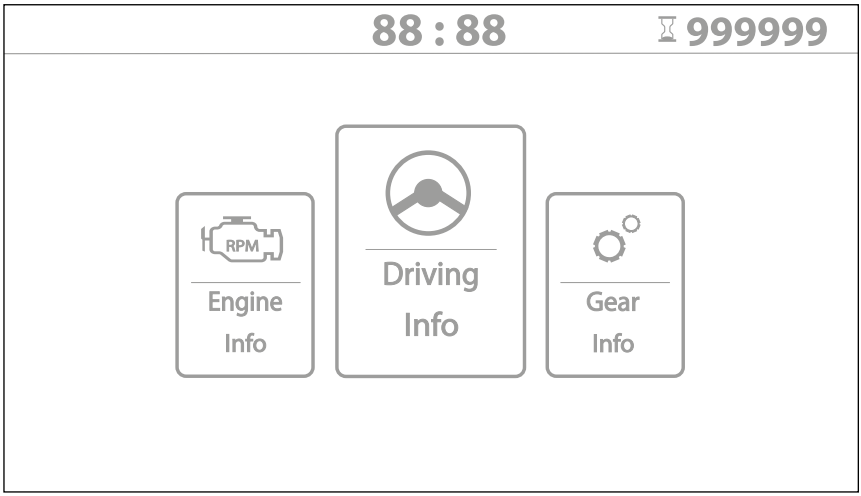
Menu language can be changed from this page. Rotate the menu button to navigate between language options. Press the button to set the selected target language.

Errors



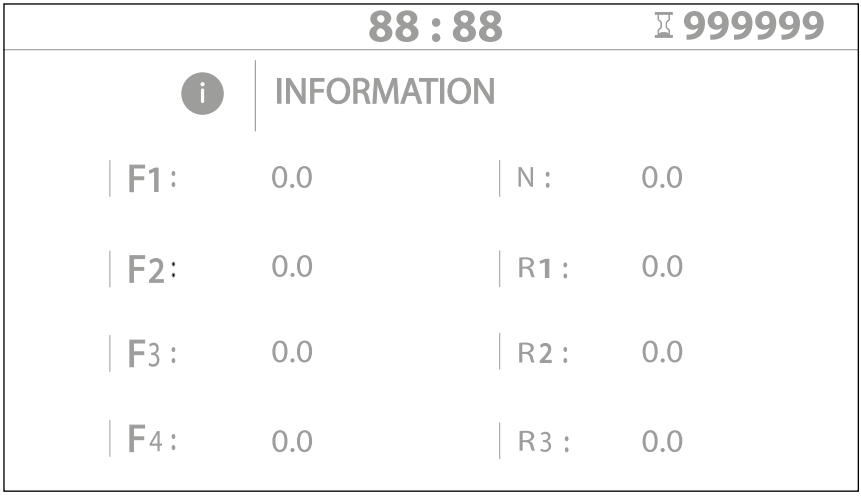
Active errors can be seen form this page. Pull the menu button towards you to return to the MENU page.

Info Menu Screen



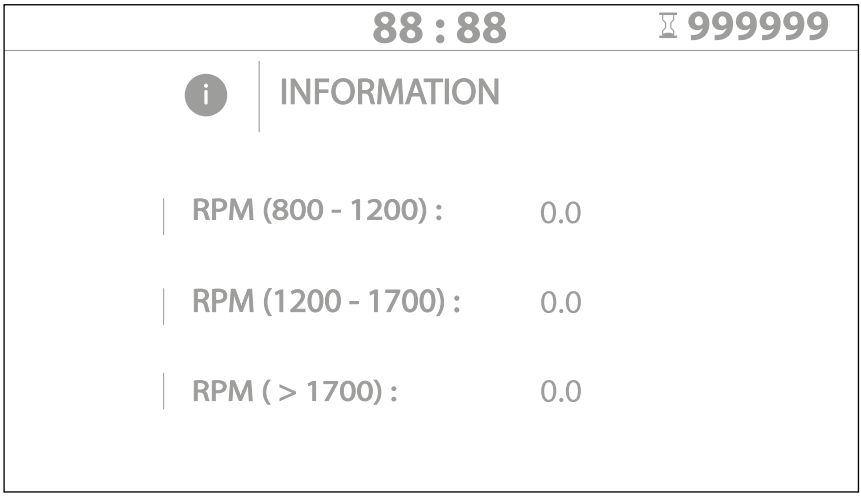
Engine, transmission and driving information sub-pages can be accessed from this page. Rotate the menu button to left or right to select the sub screen and press onto button.

Information Screen (Gear)



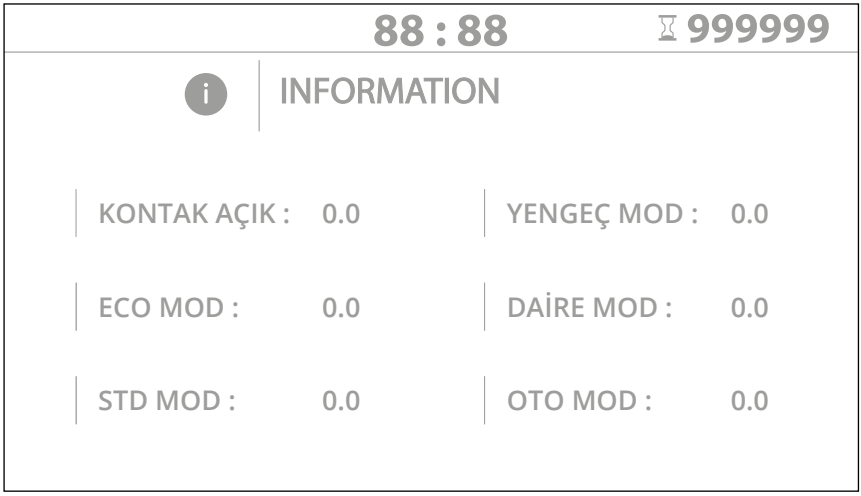
Transmission related informations can be seen form this page. Pull the menu button towards you to return to the MENU page.

Information Screen (Engine)



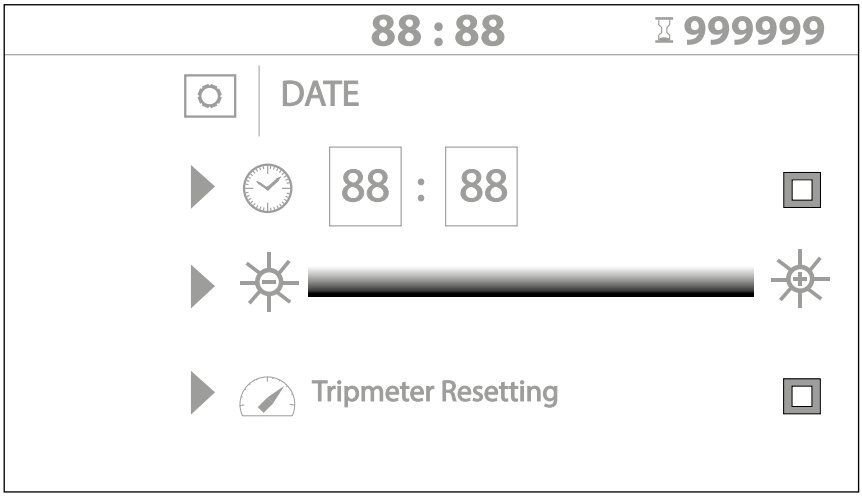
Engine related informations can be seen form this page. Pull the menu button towards you to return to the MENU page.

Information Screen (Driving)



Driving informations can be seen form this page. Pull the menu button towards you to return to the MENU page.

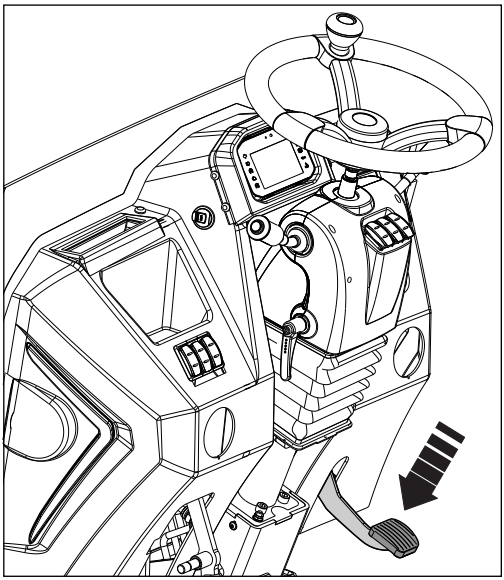
Cluster Settings Screen



Time, illumination and trip meter reset sub-pages can be accessed from this page. Rotate the menu button to left or right to select the sub screen and press onto button.

3.1.6 Accelerator Pedal

To increase the engine rpm, push the accelerator pedal. To decrease the engine rpm, release the gas pedal. The engine will run on idle when you take your foot off the pedal.



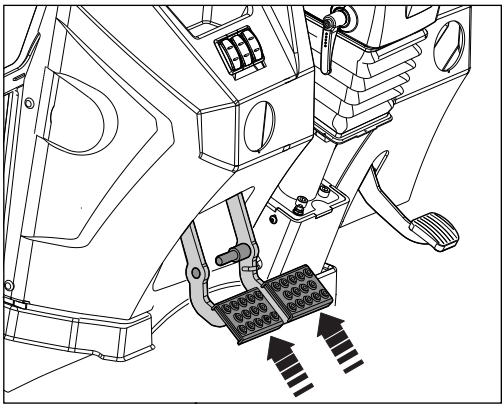
⚠ WARNING

Use only the gas pedal to increase the engine rpm while driving the machine. Do not use hand throttle to adjust the engine rpm while driving.

3.1.7 Foot Brake Pedals

Press the breaking pedal to slow down or stop the machine. Use the brakes to avoid over speeding while driving down slopes.

Your machine has equipped with two foot brake pedals. The pedal on the left is to operate left side brakes. The pedal on the right is to operate right side brakes.



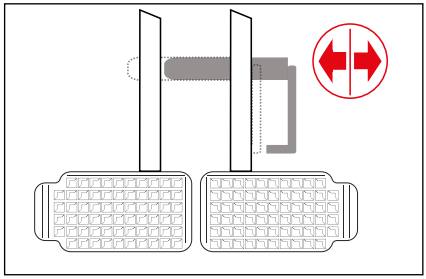
⚠ DANGER

When driving for an extended period and 2WS steering mode, the brake pedal locking pin should be inserted. Otherwise uneven pressed brakes may lead to accidents.

Brake Pedal Lock

To ensure synchronized operation of the brakes, the locking pin should be inserted. To remove the pin, hold the pin handle clockwise (1) and pull to the right (2).

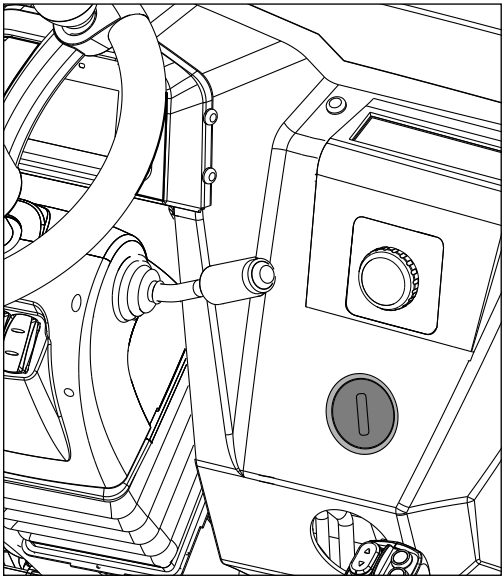
To re-insert the pin, follow the instructions in reverse order.



3.1.8 Steering Modes (Only for 4WS Machines)

You can move the machine in 3 individual steering modes depending on working conditions.

Use the switch located on the right side of the indicator panel to select "A" crab walk, for "B" 2WS and "C" for 4WS steering positions.



> **WARNING**
>
> To identify the steering mode during driving, check the warning lights on the indicator panel.

A

Crab Drive
Front and rear wheels turn simultaneously. This position will improve maneuverability in limited space.

B

2WS Drive
The steering system will only turn the front wheels. Use this mode when driving in public places.

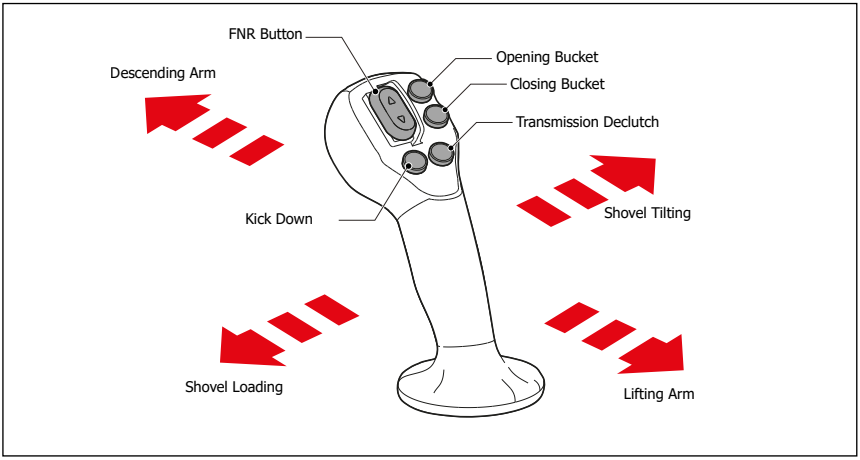
C

4WS Drive
The front and rear wheels will turn in the opposite direction. This position provides very sharp turns.

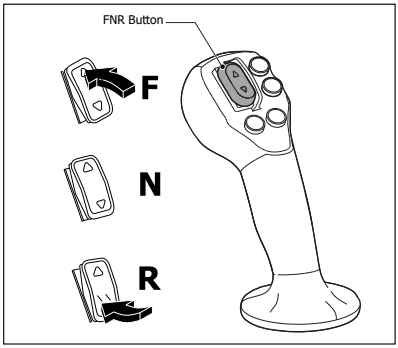
DANGER

- Do not change the steering mode during driving. To change the mode, the machine should be stopped.
- Change the steering mode only when the engine is in idle rpm.
- Don't switch directly from crab mode to 4WS mode or vice versa.
- First switch to 2WS for at least for 5 sec. To be sure that the front and rear tires are aligned turn the steering wheel up to the end and back to the central position. After that you can change the steering mode.

3.1.9 Loader Control Arms (Joystick Type - Husco)



FNR Button



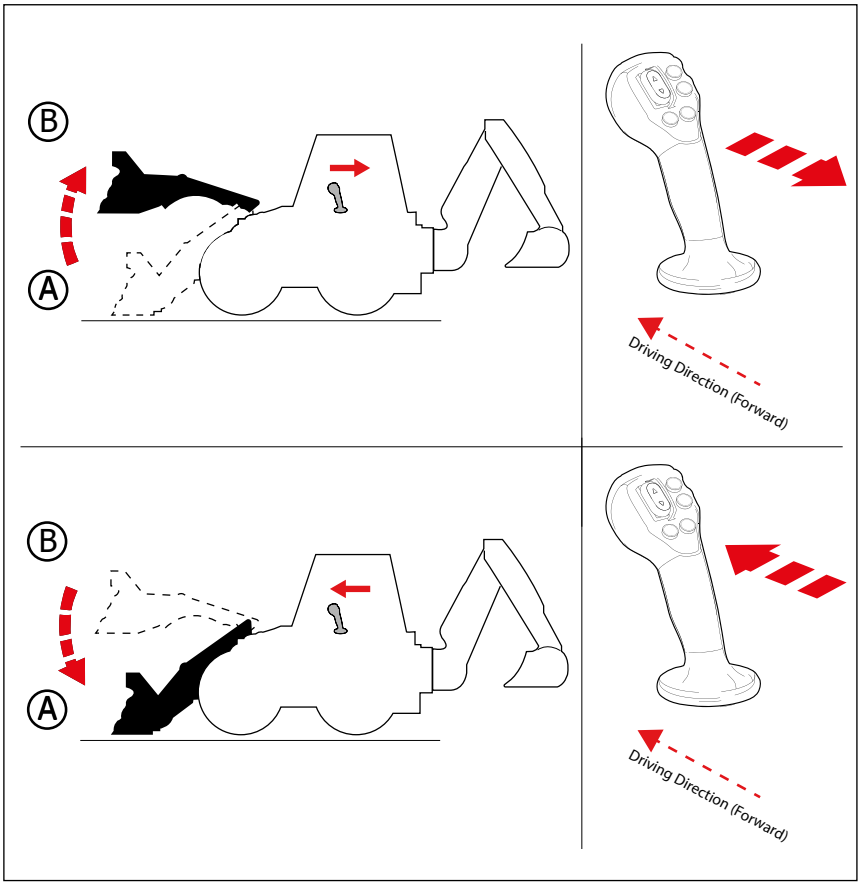
To drive forwards **(F)** push upper side of the button.

To drive backwards **(R)** push lower side of the button.

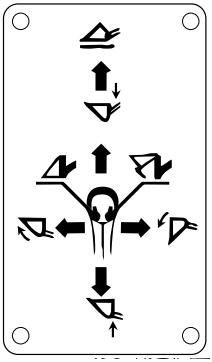
INFORMATION

To use this function gearshift lever has to be in neutral and FNR button activated.

Raising the Loader Boom



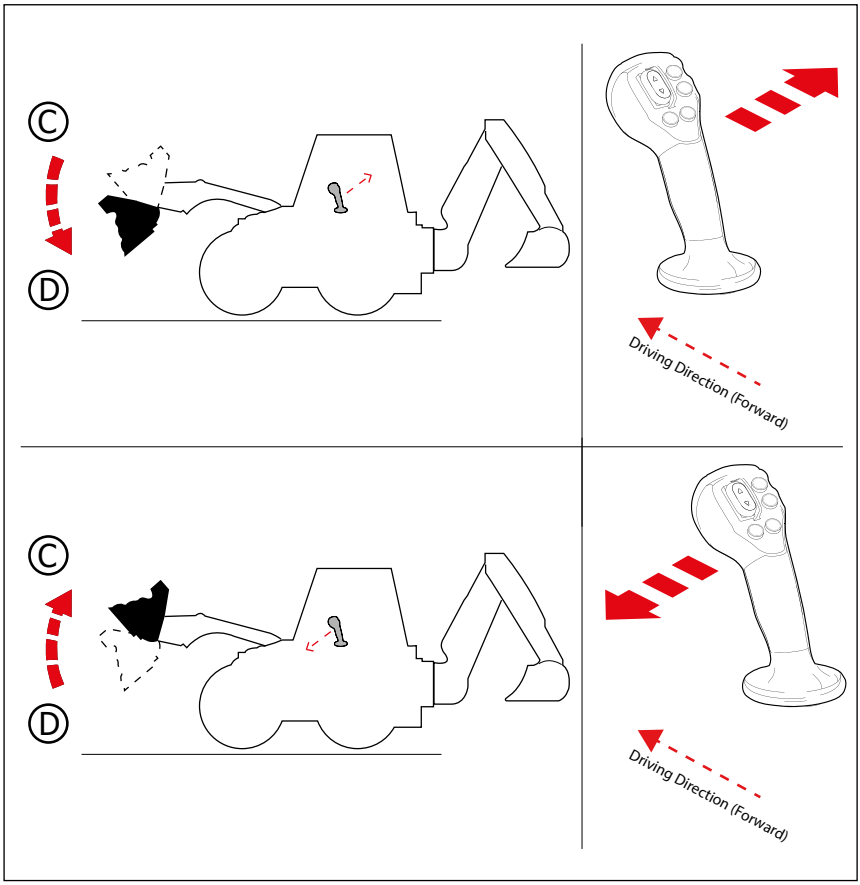
To raise the loader (from position A to B) pull the controller joystick towards you. As it is rising, the angle of the shovel with the ground remains constant. This is because of parallel connections on the boom.



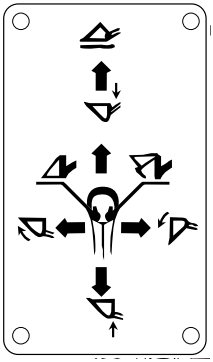
Lowering the Loader Boom

To lower the loader (from position B to A) push the controller joystick forward.

Rolling the Loader Bucket Forward



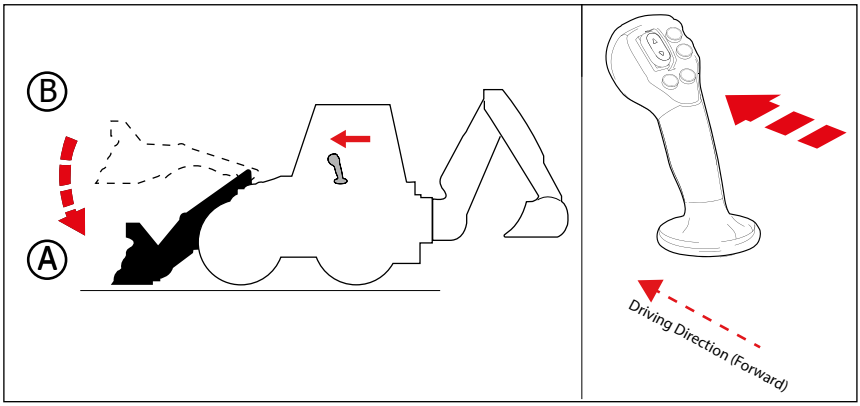
To roll the loader bucket forward (from position C to D) push the controller joystick to the right.



Rolling the Loader Bucket Backward

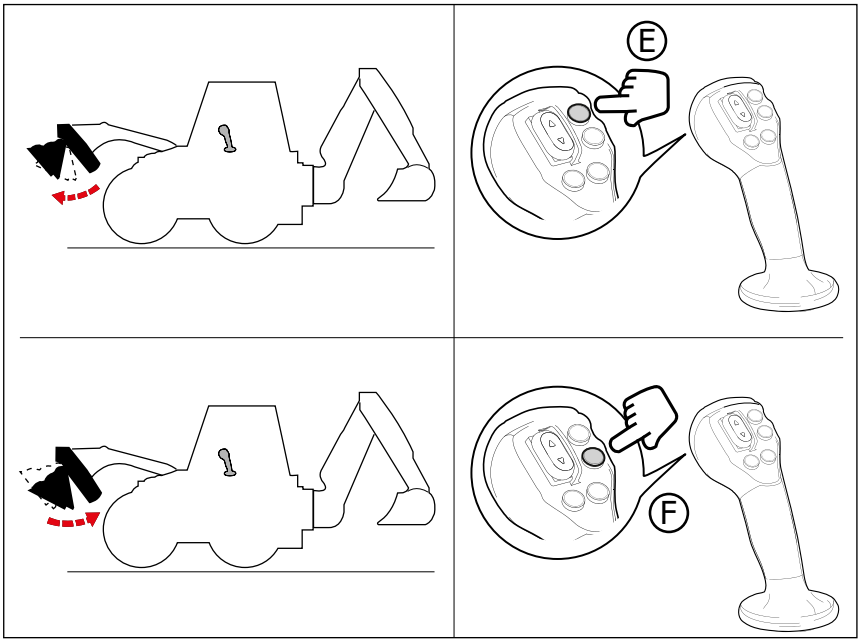
To roll the loader bucket backward (from position D to C) push the controller joystick to the left.

Floating Position



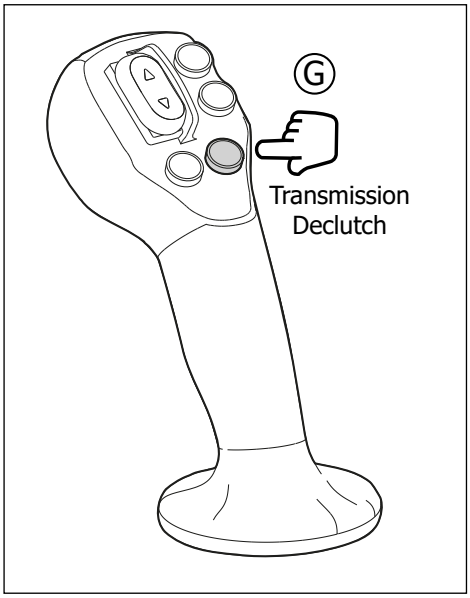
In order to move the loader on the ground smoothly push controller joystick forwards to the maximum position until it remains there.

Opening the Bucket



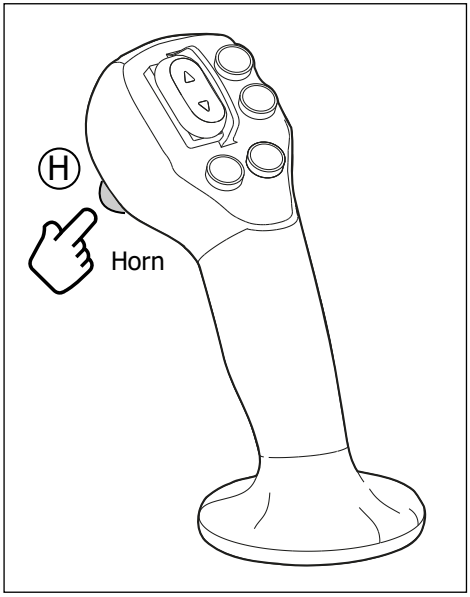
To open the bucket, press the button (**E**) located on the right of the controller joystick. To close the bucket, press the button (**F**) located on the right of the controller joystick.

Transmission Declutch Button



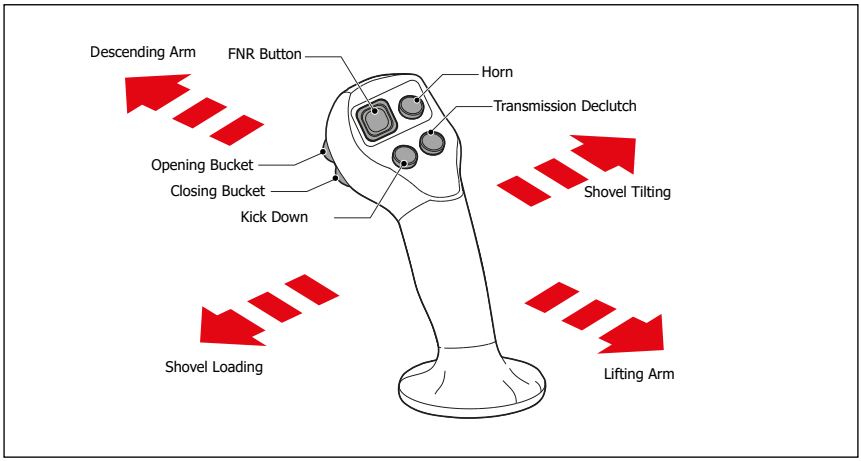
Press button (**G**) to declutch the transmission. Hence the transmission is in neutral position, acceleration pedal can be pressed to increase the hydraulic power freely.

Horn Button

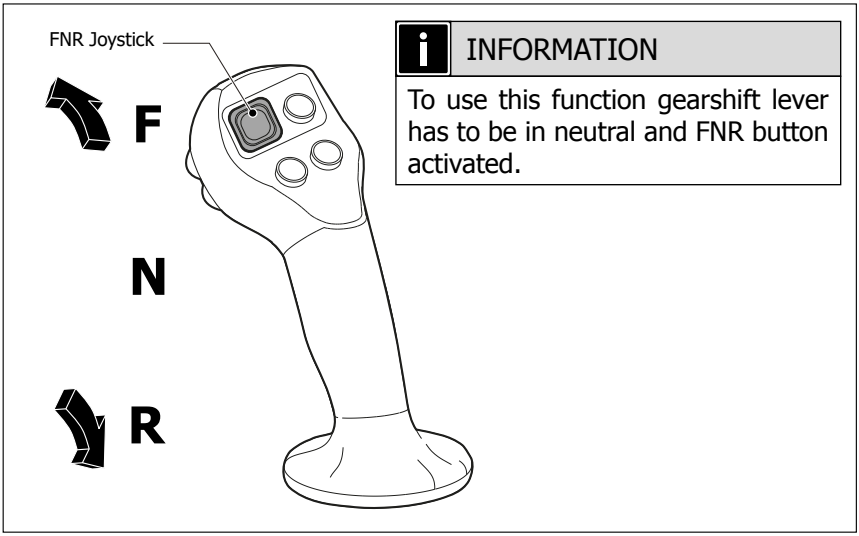


Press button (**H**) to activate the horn.

3.1.10 Loader Control Arms (Joystick Type - Rexroth)



FNR Button

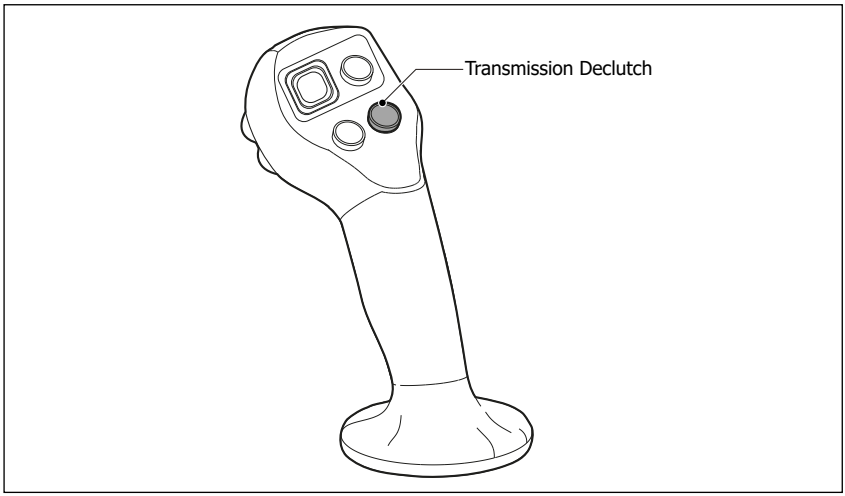


INFORMATION

To use this function gearshift lever has to be in neutral and FNR button activated.

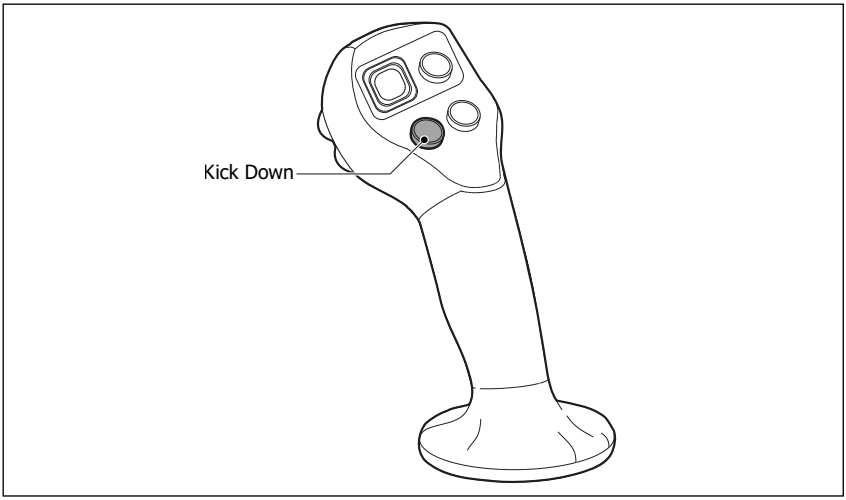
To drive forwards **(F)** push upper side of the button. To drive backwards **(R)** push lower side of the button.

Transmission Declutch Button



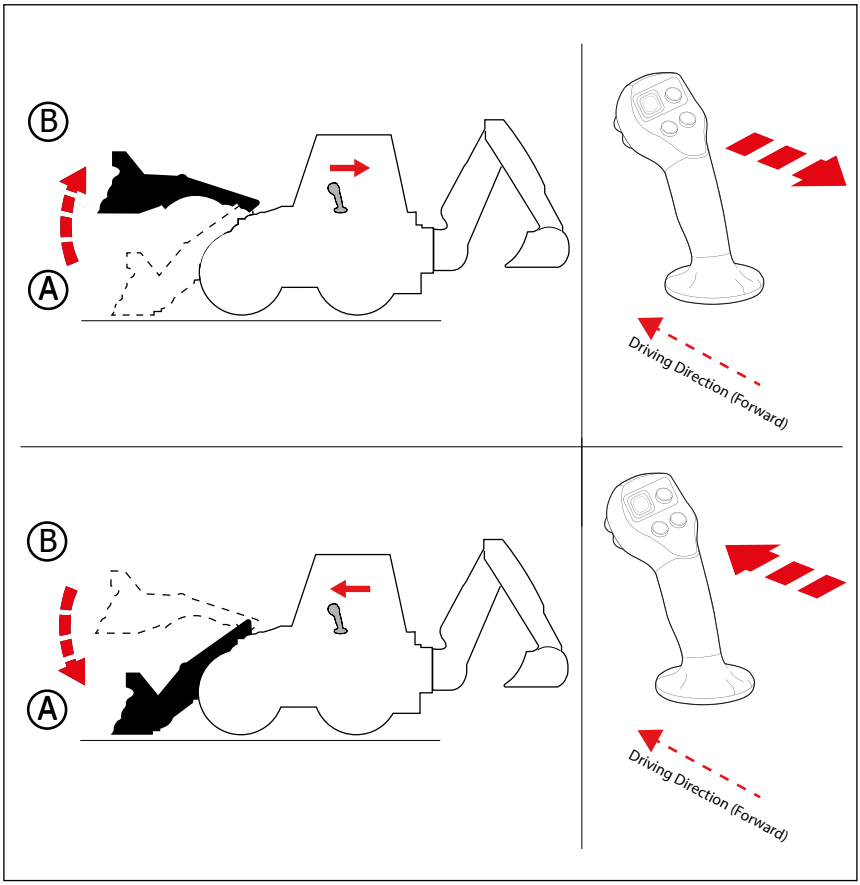
Press button to declutch the transmission. Hence the transmission is in neutral position, acceleration pedal can be pressed to increase the hydraulic power freely.

Kick Down Button

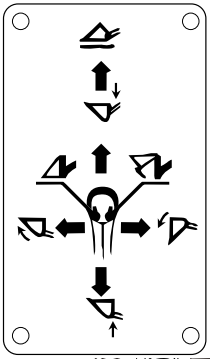


Kick down function is used when maximum speed is required. When the kick down button is depressed, a lower gear is immediately engaged.

Raising the Loader Boom



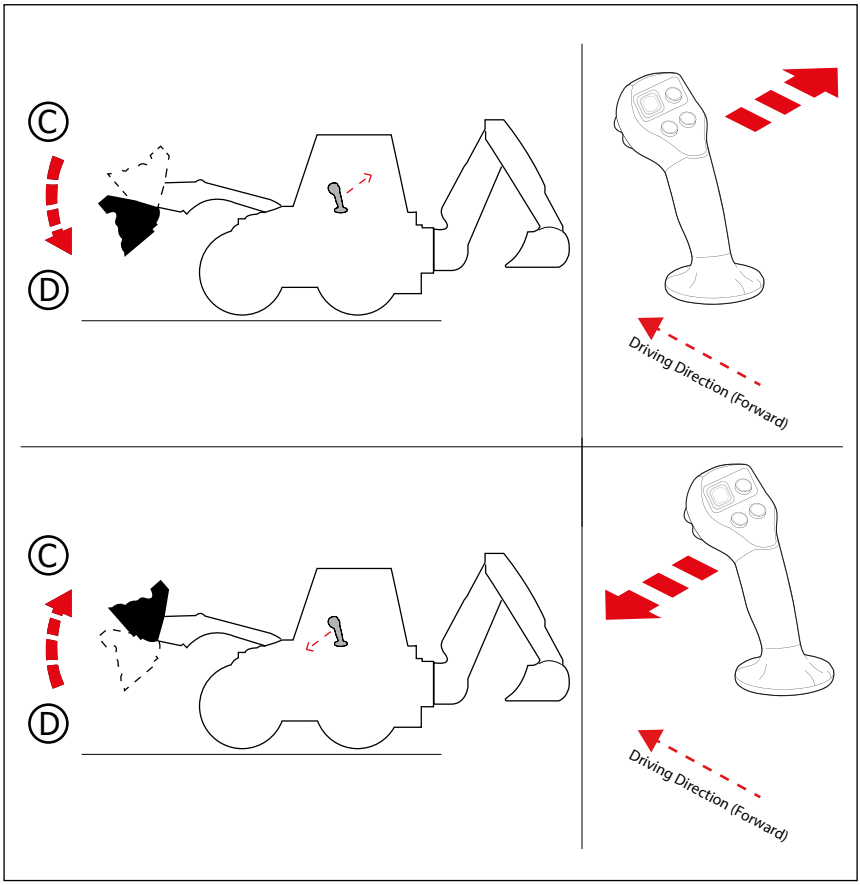
To raise the loader (from position A to B) pull the controller joystick towards you. As it is rising, the angle of the shovel with the ground remains constant. This is because of parallel connections on the boom.



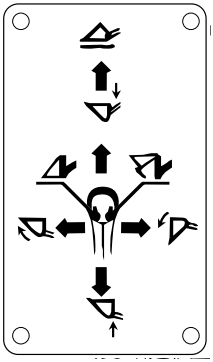
Lowering the Loader Boom

To lower the loader (from position B to A) push the controller joystick forward.

Rolling the Loader Bucket Forward



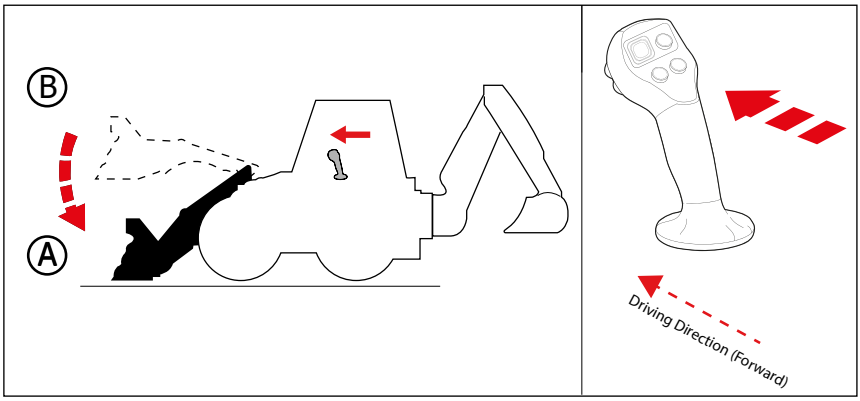
To roll the loader bucket forward (from position C to D) push the controller joystick to the right.



Rolling the Loader Bucket Backward

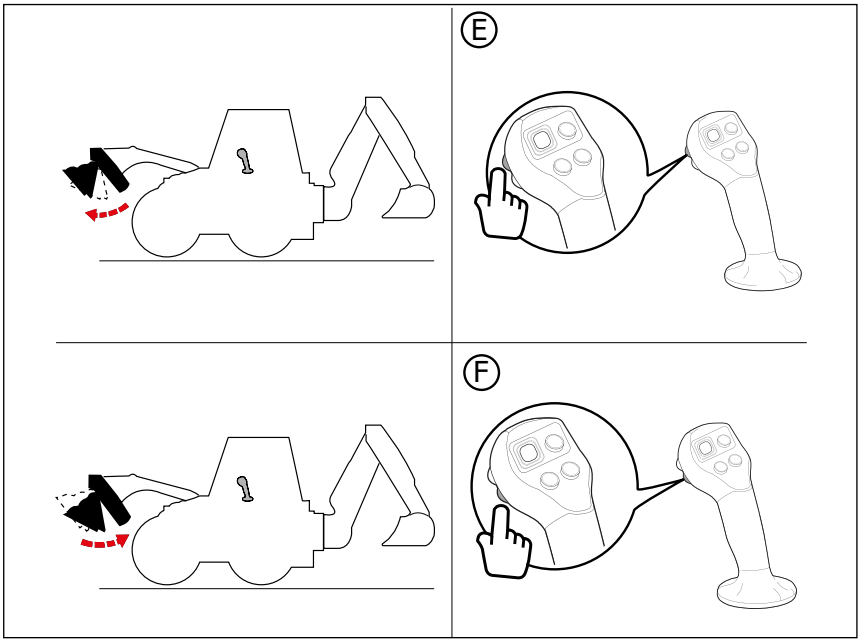
To roll the loader bucket backward (from position D to C) push the controller joystick to the left.

Floating Position



In order to move the loader on the ground smoothly push controller joystick forwards to the maximum position until it remains there.

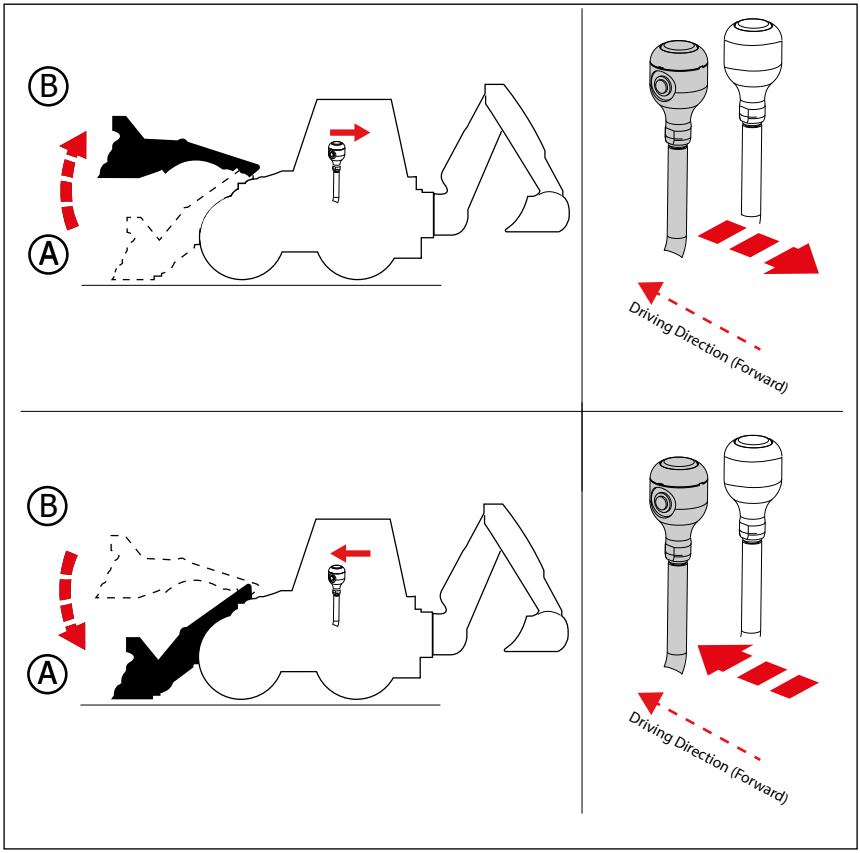
Opening the Bucket



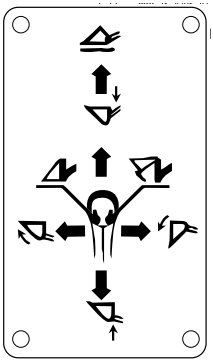
To open the bucket, press the button (**E**) located on the joystick. To close the bucket, press the button (**F**) located on the controller joystick.

3.1.11 Loader Control Arms (Lever Type)

Raising the Loader Boom



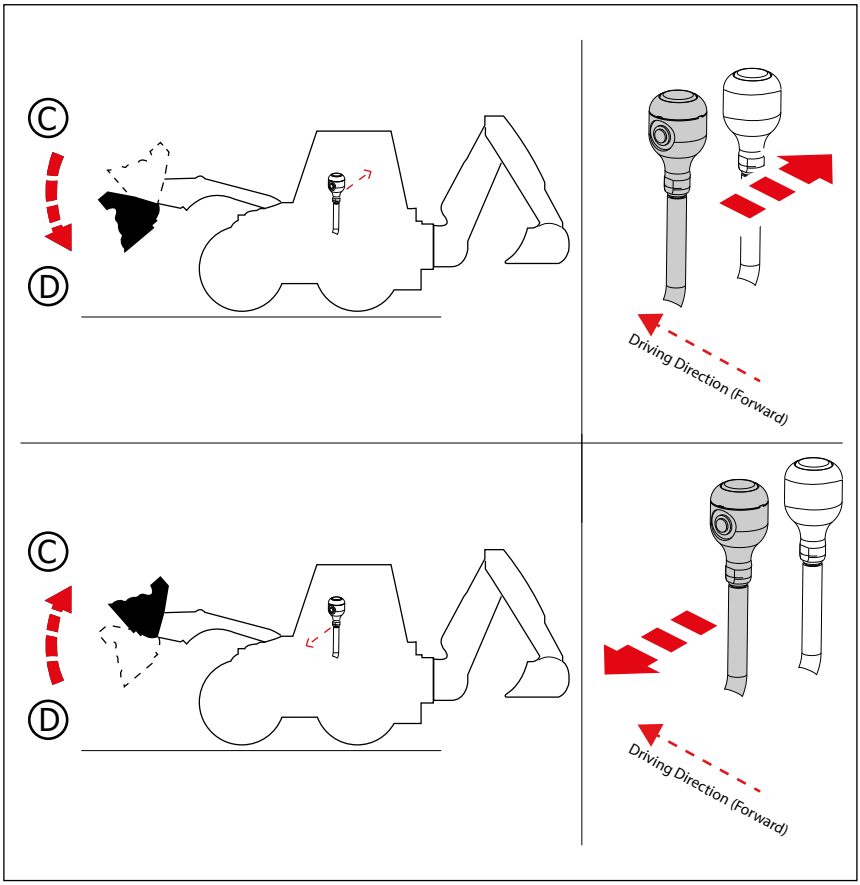
To raise the loader (from position A to B) pull the controller lever towards you. As it is rising, the angle of the shovel with the ground remains constant. This is because of parallel connections on the boom.



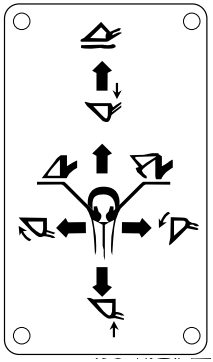
Lowering the Loader Boom

To lower the loader (from position B to A) push the controller lever forward.

Rolling the Loader Bucket Forward



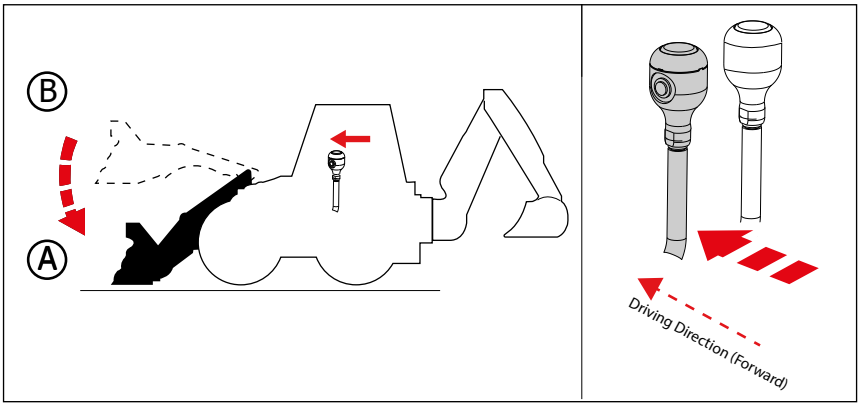
To roll the loader bucket forward (from position C to D) push the controller lever to the right.



Rolling the Loader Bucket Backward

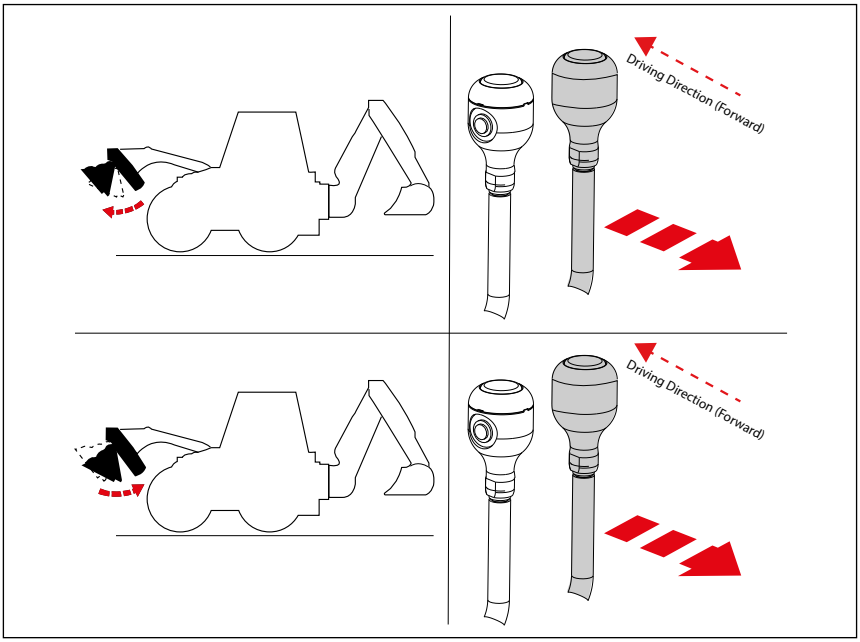
To roll the loader bucket backward (from position D to C) push the controller lever to the left.

Floating Position



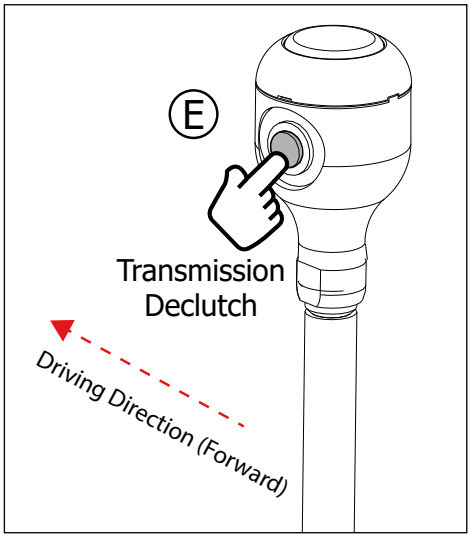
In order to move the loader on the ground smoothly push controller lever forwards to the maximum position until it remains there.

Opening the Bucket



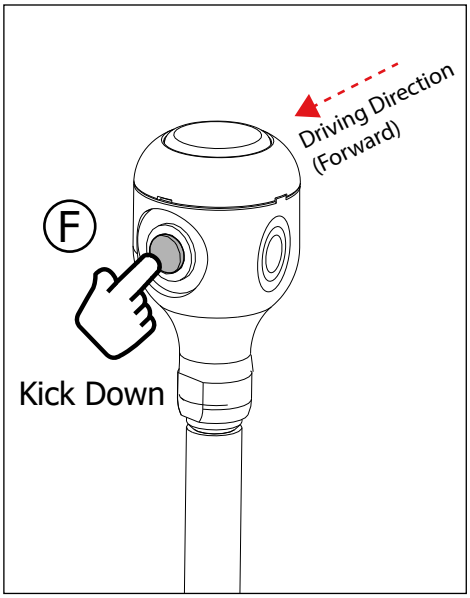
To raise the bucket front side pull the controller (right) lever towards you. To lower the bucket front side push the controller (right) lever forward.

Transmission Declutch Button



Press button (**E**) to declutch the transmission. Hence the transmission is in neutral position, acceleration pedal can be pressed to increase the hydraulic power freely.

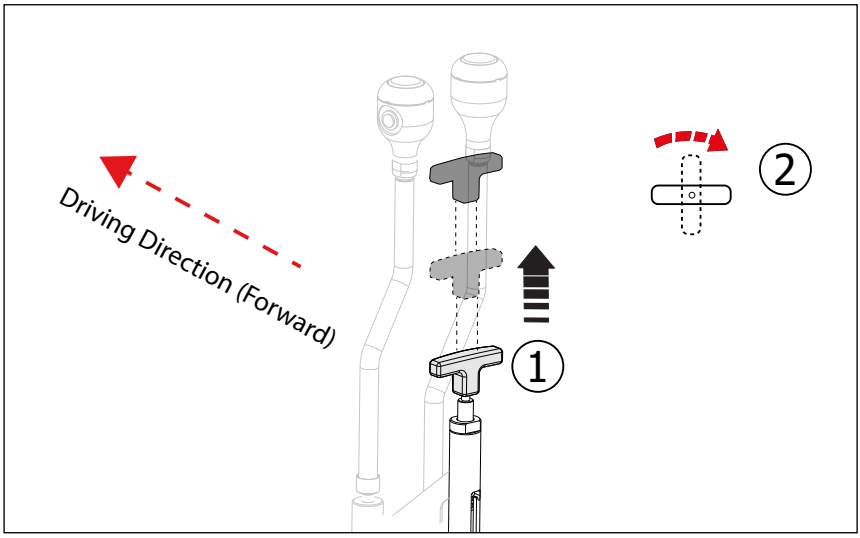
Kick Down



Kick down function is used when maximum speed is required. Press button (**F**) to activate kick down function.

When the kick down button is depressed, a lower gear is immediately engaged.

Control Lever Lock



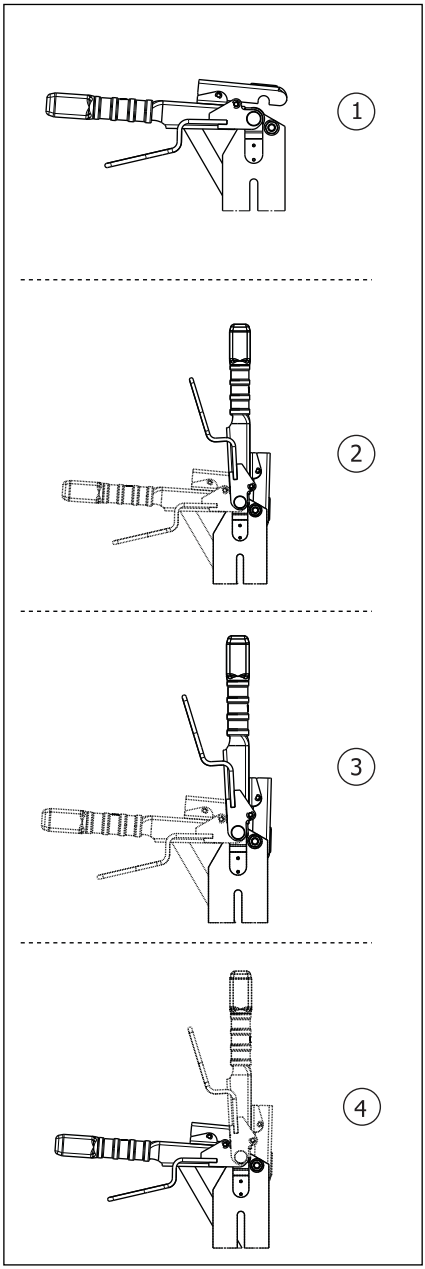
Control levers can be locked in order to prevent accidentally operated when the driver is entering or leaving the cab.

To lock the levers, pull the lock handle upwards (**1**) and rotate it clockwise (**2**). In this position, levers can not be used.

To unlock; rotate the handle counter clockwise and push it downwards.

⚠	WARNING
It is recommended that lever lock should be locked when driving on highways.	

3.1.12 Parking Brake



Parking Brake is used to prevent the machine to slip while stopping. Do not use the parking brake to decelerate a moving machine except emergencies. In these situations the effectiveness of the braking will be reduced.

To engage the parking brake, pull the arm (1) upwards. When the parking brake is activated, the warning light on the indicator panel will be illuminate. (2)

⚠ WARNING

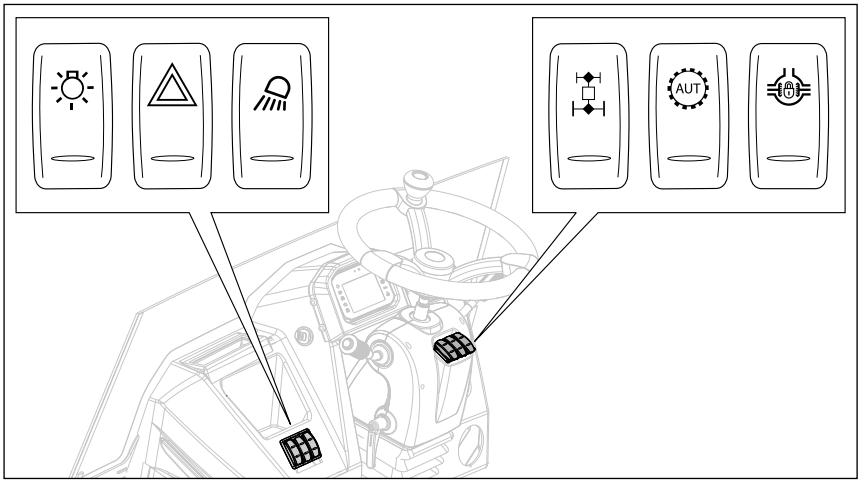
The brake pads should be replaced every time if the parking brake is used in emergencies.

To disengage the parking brake, press the latch on the lever (3) and pull the lever down (4).

⚠ DANGER

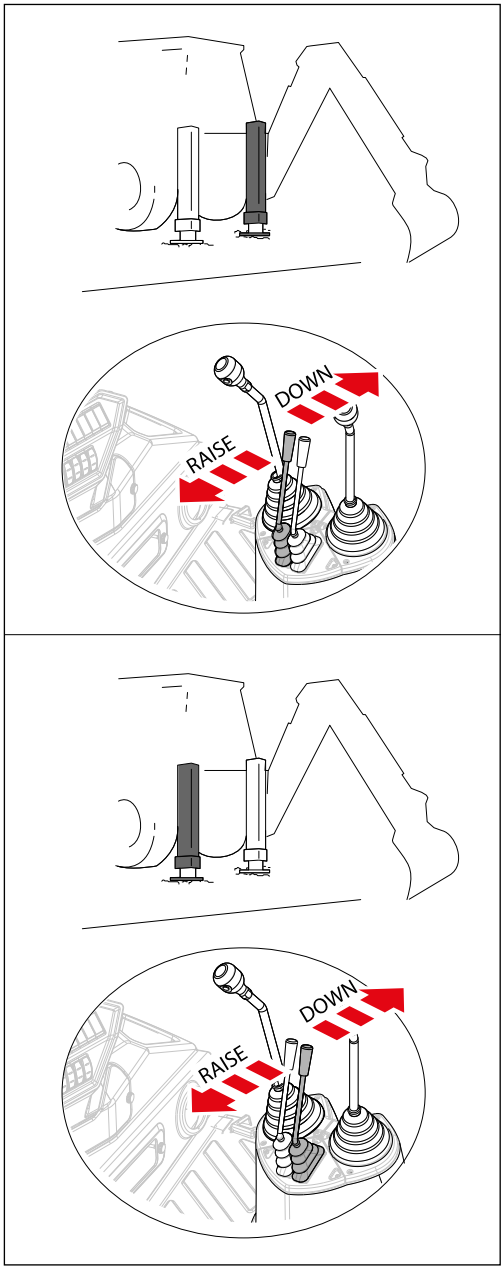
When the parking brake is disengaged, the warning light will turn off. If the parking brake is not fully disengaged, the electronic control system of the machine will prevent the machine's movement.

3.1.13 Front Dashboard Buttons



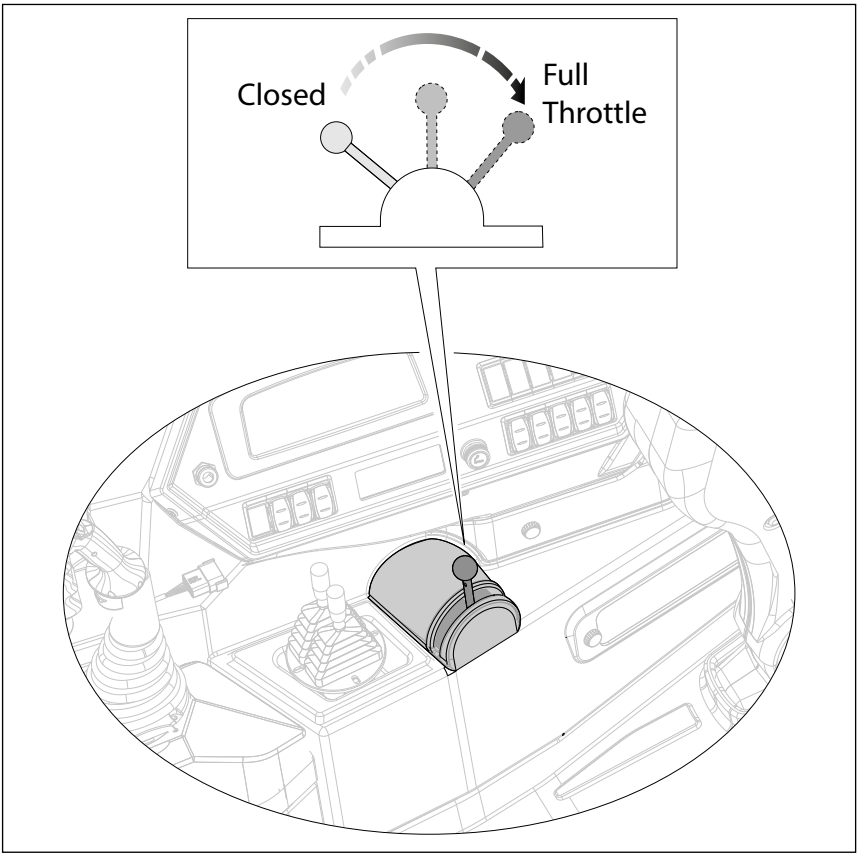
	All Wheel Drive Button Press lower side of the button to activate the four wheel drive mode. Press upper side of the button to deactivate it. This function is automatically activated and deactivated if you press the brake pedal while the machine is in 3rd or 4th gear.
AUT	**Auto Manual Gear Button** Press the button to change transmission mode from manual to automatic.
	Differential Lock Button Press the button to lock the differential (Optional). DO NOT steer while the differential lock is engaged.
	Parking Lights Button Its a two level button. It activates parking lights and headlamps. First position activates parking light and second position activates headlight.
	Hazard Warning Light (Flasher) Button Press the button to turn on the flasher. The flasher must be used to warn the other operators.
	Front Working Light Button Its a two level button. At the first level only two lamps are turned on.

3.1.14 Stabilizer Control Levers



The stabilizer controller levers should be in sync (both left and right controllers) unless required otherwise. To lower the stabilizer, push the arms forward.

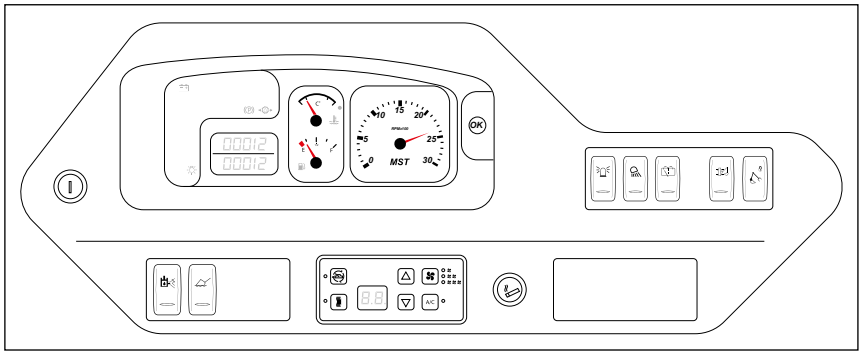
3.1.15 Hand Throttle



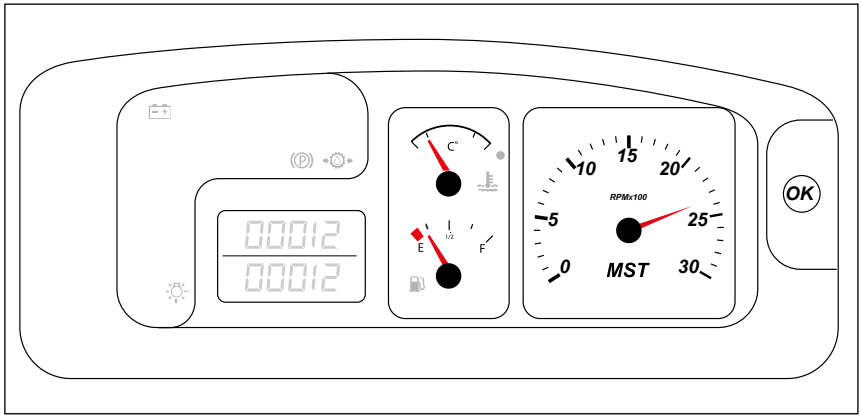
To obtain the required engine speed while using the backhoe section of the machine, use the hand throttle on the side panel. When you lower the hand throttle, the power will increase based on the engine rpm and vice versa when the hand throttle is raised.

⚠	WARNING
The engine's idle operation cycle is 800–1000 revolutions per minute. When working with the backhoe, increase the engine cycle up to 1600 rpm using the hand throttle. Use only the gas pedal to increase the engine rpm while driving the machine. Do not use hand throttle to adjust the engine rpm while driving.	

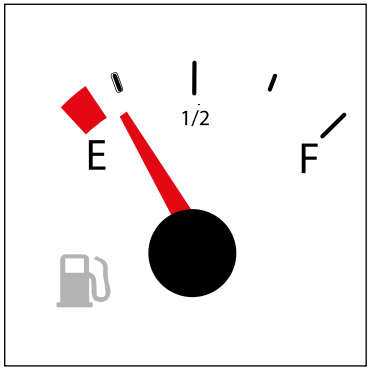
3.1.16 Side Dashboard



Cluster



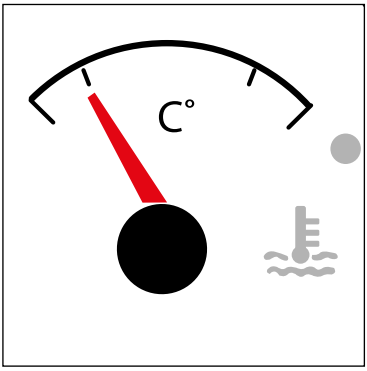
Fuel Level Gauge



Shows the fuel level in the tank.
E: Completely Empty
F : Completely Full

⚠ WARNING
Do not wait until the tank is completely empty to fill it with fuel. When the fuel is completely drained, air will leak into the system. In this case, the engine will not start until the air in the fuel system is discharged

Engine Coolant Temperature Gauge

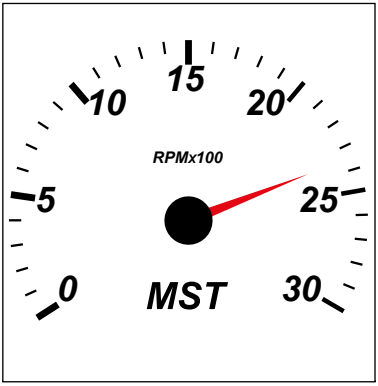


Indicates the engine coolant temperature. Engine should run continuously between 90-100 °C. If the engine coolant reaches 105 °C the panel will give a sound and a warning light will illuminate on the indicator panel.

⚠ WARNING
If the engine is overheating, park the machine on a level surface immediately and do not stop the engine. Stopping the engine when overheated would lead the engine temperature to increase significantly and may lead the engine to damage.

⚠ WARNING
When the engine is overheating, place the gear in idle. If turned on, turn off the AC unit. Activate the parking brakes. Leave the engine to operate at idle without pressing the gas pedal until the temperature is below 100 °C.

Engine RPM Gauge



Shows the engine speed in revolutions per minute (rpm).

Actual speed = Value specified on the dial (rpm) x 100

⚠ WARNING
During driving, check the engine rpm regularly. To save fuel and keep the engine in working condition, do not exceed 2200 rpm.

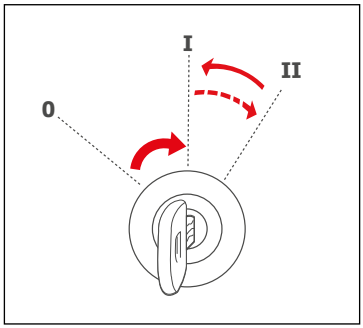
Warning Lamps

	**Left Turning Signal (Green)** It will be flashing when the signal arm is pushed forward.
	**Parking Lights (Green)** Indicates when the ignition key is at 1st level and the parking lights are on.
	**Low Beams (Green)** Indicates when low beams are activated.
	**High Beams (Blue)** Indicates when high beams are activated.
	**ECO Mode (Blue)** Indicates when economic driving mode is activated.
	**Standard Mode (Green)** Indicates when standard driving mode is activated.
	**Brake Oil Pressure (Red)** Indicates if the lubrication oil pressure drops down.
	**Engine Oil Filter (Yellow)** Indicates that the engine oil filter is malfunctioning. It will remain unless the problem is fixed.
	**Low DEF Level (Yellow)** Indicates when the level of AdBlue in the tank is low.
	**Emission System Failure (Yellow)** Indicates that the emission system is malfunctioning. It will remain unless the problem is fixed.
	**Engine Malfunction Light (Yellow)** Indicates that the engine is malfunctioning. It will remain unless the problem is fixed.
	**Engine Stop Lamp (Red)** If this light is indicated engine should be stopped immediately. (STOP)
	**Right Turning Signal (Green)** It will be flashing when the signal arm is pulled

	**Fuel Lamp (Yellow)** Indicates when the level of fuel in the tank is low..
	**Battery Charge (Red)** Indicates that the battery voltage is low or the battery is defect.
	**Cooling Water Temperature (Red)** Indicates if the cooling water temperature exceeds 105 °C.
	**Parking Brake (Red)** Indicates that the parking brake arm is pulled.
	**Transmission Oil Pressure (Red)** If the pressure of transmission oil drops down below the setting value this light will illuminate.
	**Transmission Oil Temperature (Red)** If the temperature of transmission oil exceeds the setting value this light will illuminate.
	**Differential Lock (Yellow)** Indicates that the differential lock is activated.
	**Four Wheel Drive Mode (4WD) (Yellow)** Indicates when the 4WD mode is active**.**
	**FNR Joystick (Green)** Indicates that the joysticks are activated.
	**Stabilizers (Yellow)** Indicates that the stabilizers are activated.
	**Crab Steering Mode (Yellow)** Indicates that the crab walk mode is activated in order to turn the front and rear wheels to the same direction.
	**2 Wheel Steering Mode (Yellow)** Indicates that the machine is in 2WS mode. It will remain as long as the mode is active.
	**4 Wheel Steering Mode (Yellow)** Indicates that the machine is in 4WS mode. It will remain as long as the mode is activated.
	**Slow (Yellow)** Indicates that the slow operating mode is activated.

	**Fast (Yellow)** Indicates that the fast operating mode is activated.
	**Hydraulic Oil Temperature (Red)** If the temperature of hydraulic oil exceeds the setting value this light will illuminate.
	**Engine Pre Heat (Yellow)** Indicates that the ignition glow plugs are heating before starting the engine.
	**Engine Oil Pressure (Red)** Indicates if the lubrication oil pressure drops down.
	**Air Filter (Yellow)** Indicates that the air filter is clogged due to dirt and dust.

Ignition Key



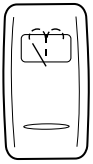
⚠ DANGER

Do not activate the starter engine for more than 20 seconds at once. Wait at least 2 min. to let the starter cooling between two attempts.

0	Switch the key to this position to stop the engine. Ensure that before stopping the engine, the gear selector should be switched to neutral, the attachments lowered and the parking brake engaged.
I	In this position, the battery, lights and all electrical circuits are energized. (Lights and danger warning circuits are always energized). Before cranking the engine, keep the key at this position for about 30 seconds in cold weather to heat the induction coils.
II	This position activates the starter engine. When the ignition key is released at position II, it will automatically come back to position I.

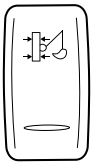
Side Dashboard Buttons

Rear Working Light Button
Press the button to turn on the rear working lights. As long as the function is active the LED on the button will be illuminate.



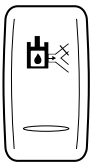
Rear Window Wiper Button
The rear window wiper button is a two level button.

↑	Rear window wipers are deactivated	↕	Keep pressed for windshield washer
↓	Rear window wipers are activated		



Kingpost Clamps
To release the kingpost clamps press the lower section of the button. To tighten them, press the upper section of the button and move joystick up to the end till the hydraulic system pressure reaches the max level.

Boom Lock Hatch Button
To disengage the boom lock press the upper section of the button, to engage it press the lower section of the button.

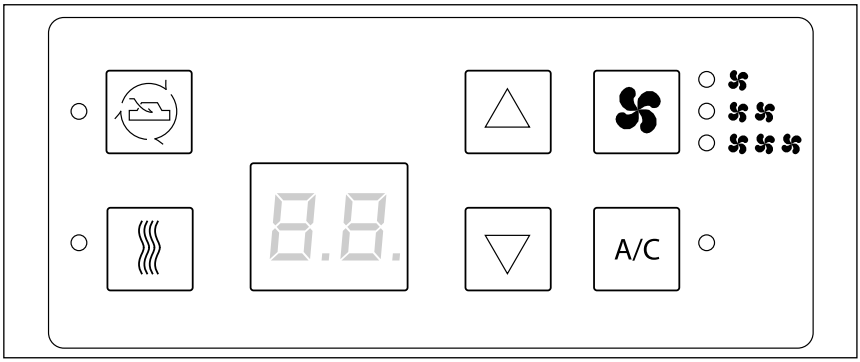


High Power Mode Activation
Push the lower side of button to activate high power mode. This mode is used to when doing sensitive work.

Beacon Button
To initiate the warning light press the button. As long as the function is active the LED on the button will be illuminate.

Floating Position Button
To activate the floating position press the button and push the joystick forward. This button is only available at the machines with Rexroth hydraulic components.

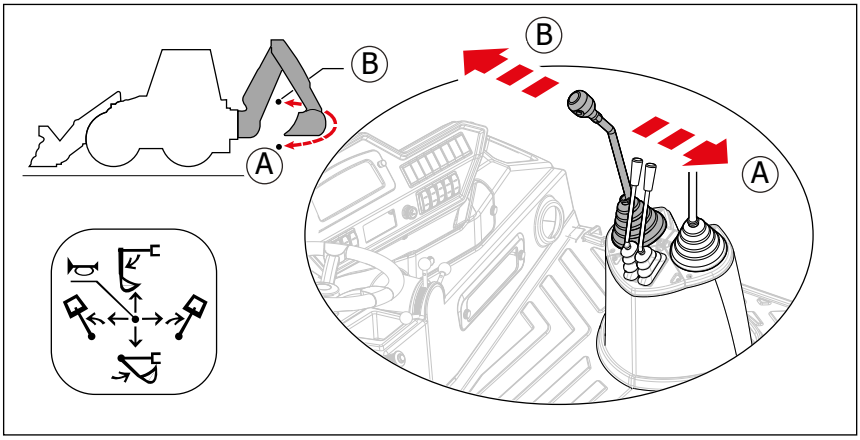
A/ C Unit Control Panel



	Air Circulation Button Stops air fresh air intake and circulates indoor air.
	Heater Mode On/Off Button It is used to activate the heater mode.
	Temperature Set Button (Increase) It is used to increase the set temperature of A/C unit.
	Temperature Set Button (Decrease) It is used to decrease the set temperature of A/C unit.
	Fan Speed It is used to adjust the fan speed. **"0"** is off; **"3"** is the highest fan speed.
A/C	**AC UNIT On/Off Button** It is used to activate the AC unit.
	Digital Display Displays the set temperature of A/C unit.

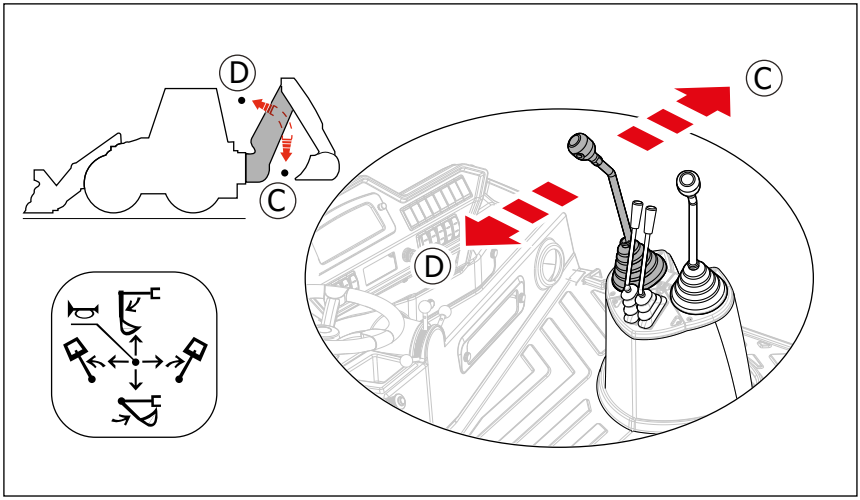
3.1.17 Backhoe Control Arms (Lever Type)

Slewing the Boom



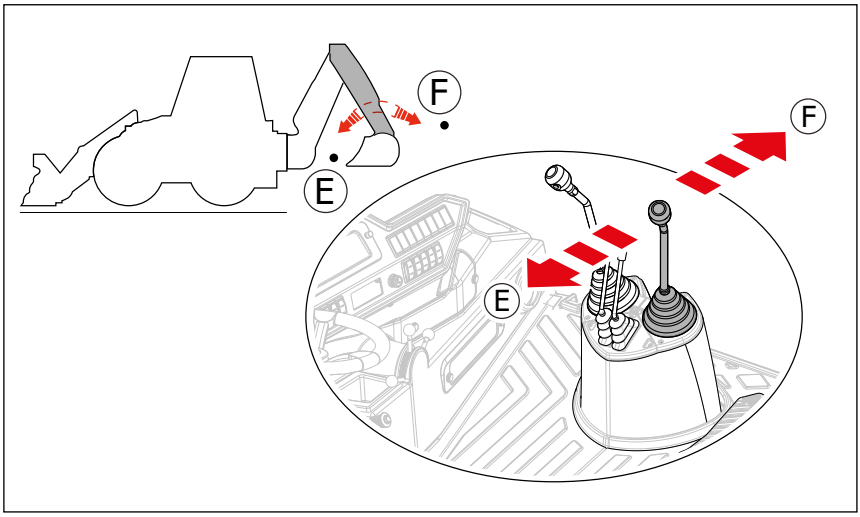
To slew the boom to your right (**A**), move the lever to your right. To slew the boom to your left (**B**), move the lever to your left.

Raising - Lowering the Boom



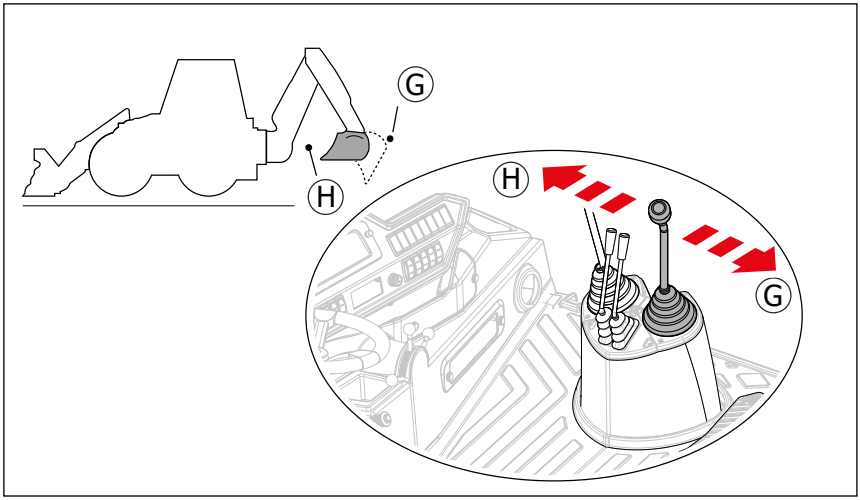
To lower the boom (**C**), push the lever forward. To raise the boom (**D**), pull the lever towards you.

Bringing Dipper In - Out



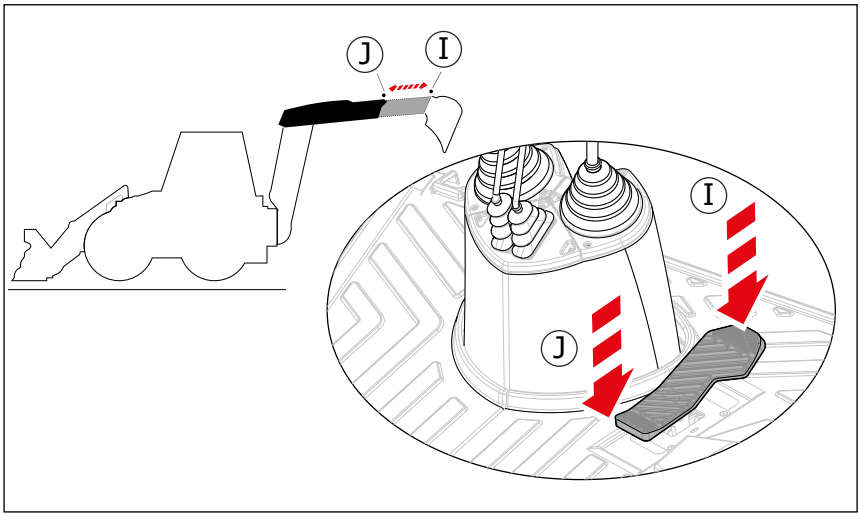
To bring the dipper in (**E**), pull the lever towards you. To bring the dipper out (**F**), push the lever forwards.

Opening - Closing the Backhoe Bucket



To close the bucket (**H**), move the lever to your left. To open the bucket (**G**), move the lever to your right.

Extracting - Retracting the Boom



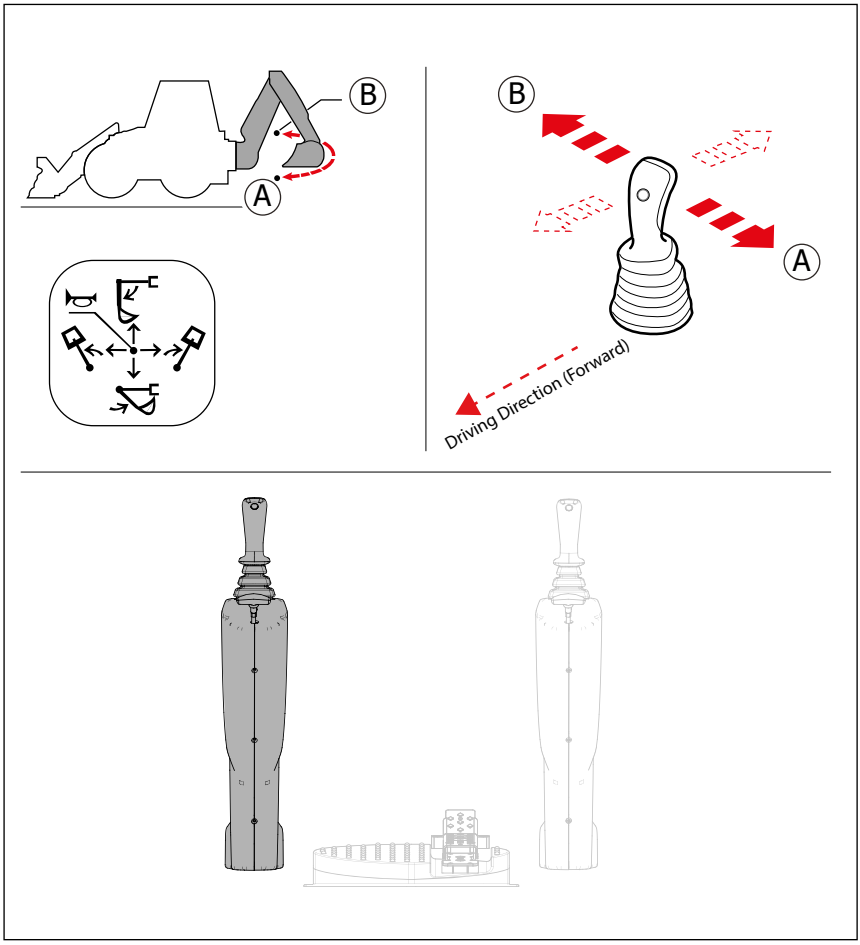
To extract dipper (**I**), push the foot pedal joystick forward. To retract dipper (**J**), push the foot pedal joystick straight back.

⚠	WARNING

- Do not extend or retract the dipper while you are tearing out material.
- Do not exceed the working capacity of the backhoe at maximum reach.

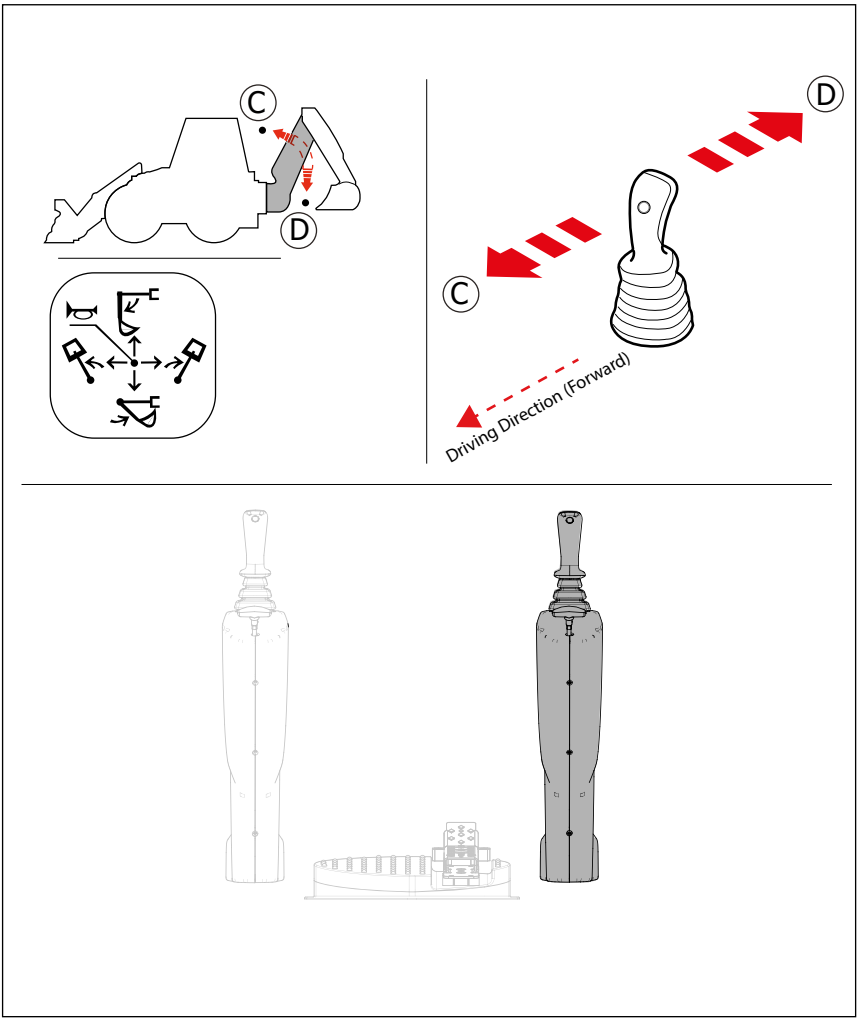
3.1.18 Backhoe Control Arms (Joystick Type - Rexroth)

Slewing the Boom



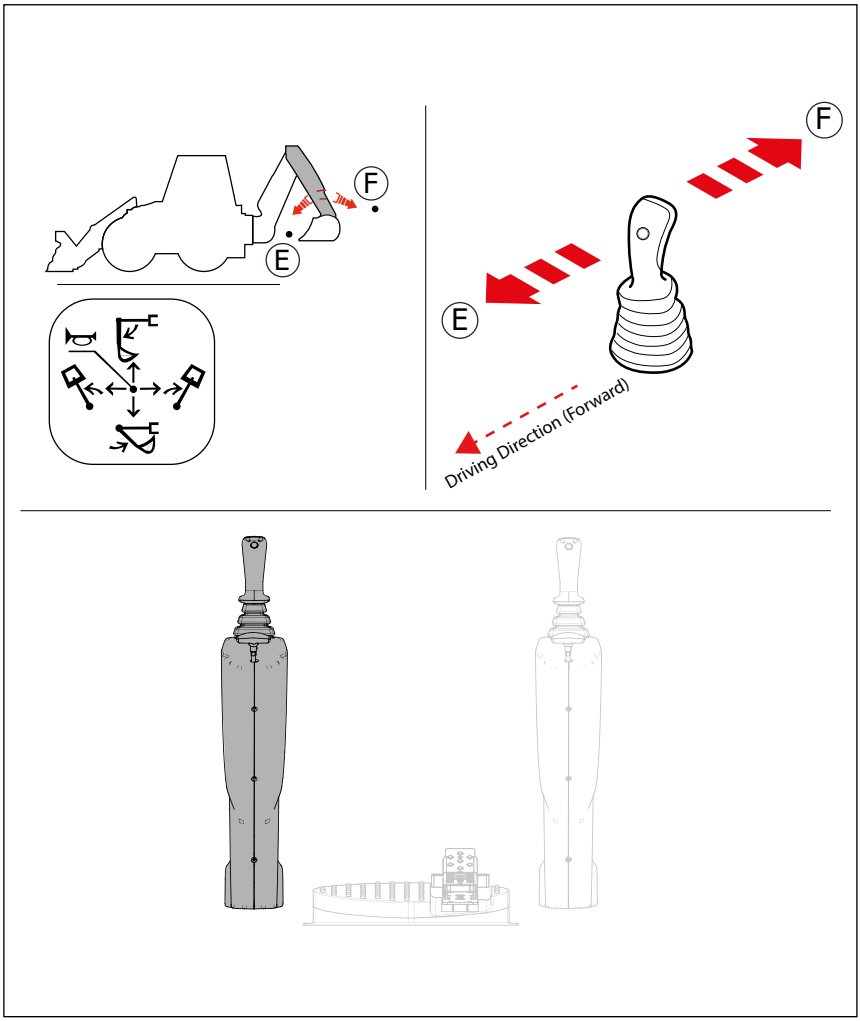
To slew the boom to your right (**A**), move the joystick to your right. To slew the boom to your left (**B**), move the joystick to your left.

Raising - Lowering the Boom



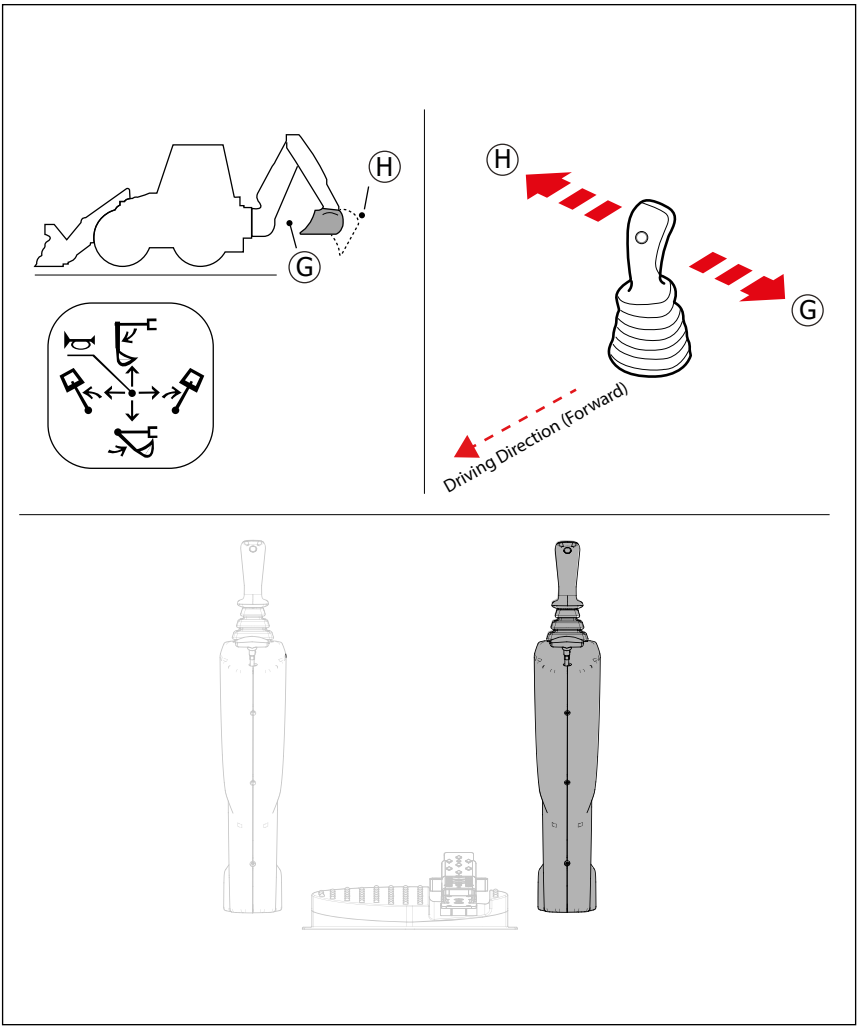
To raise the boom (**C**), pull the joystick towards you. To lower the boom (**D**), push the joystick forwards.

Bringing Dipper In - Out



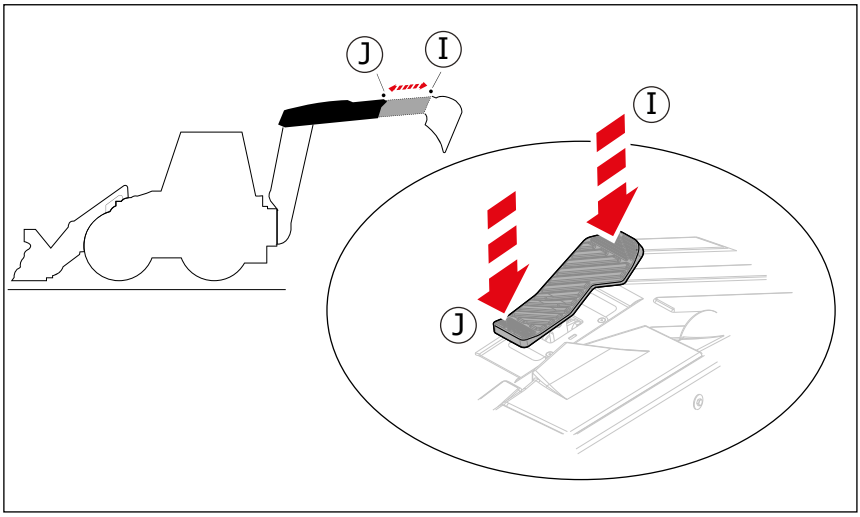
To bring the dipper in (**E**), pull the joystick towards you. To bring the dipper out (**F**), push the joystick forwards.

Opening - Closing the Backhoe Bucket



To close the bucket (**G**), move the joystick to your right. To open the bucket (**H**), move the joystick to your left.

Extracting - Retracting the Boom



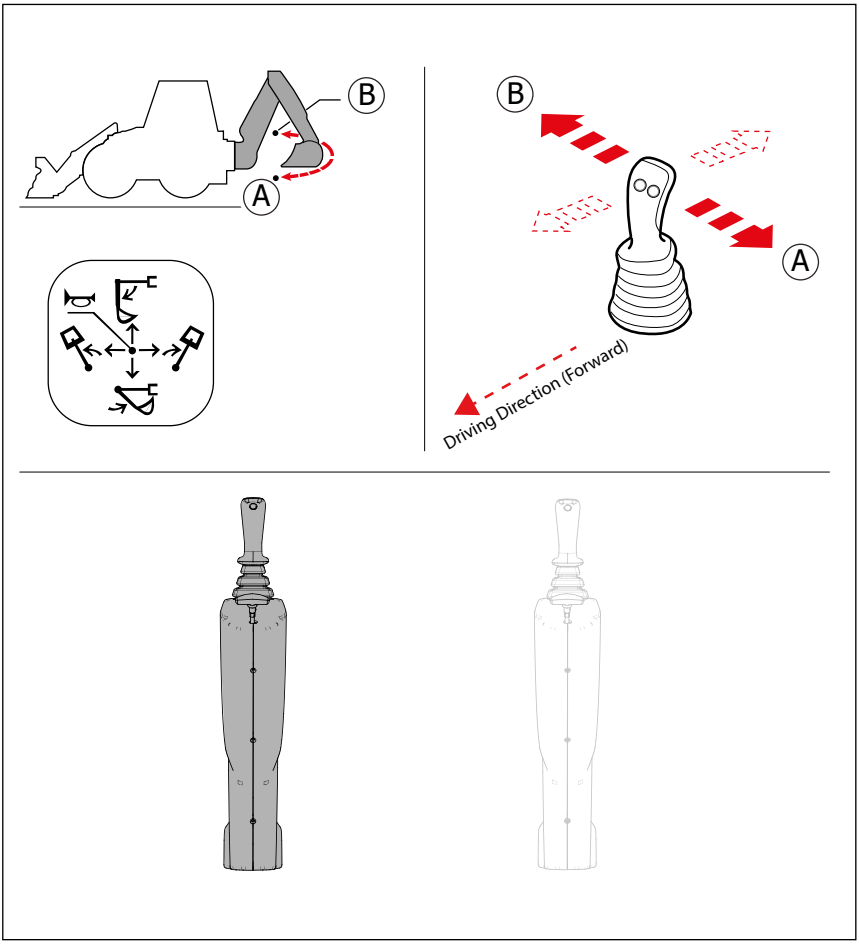
To extract dipper (**I**), push the foot pedal joystick forward. To retract dipper (**J**), push the foot pedal joystick straight back.

⚠	WARNING

- Do not extend or retract the dipper while you are tearing out material.
- Do not exceed the working capacity of the backhoe at maximum reach.

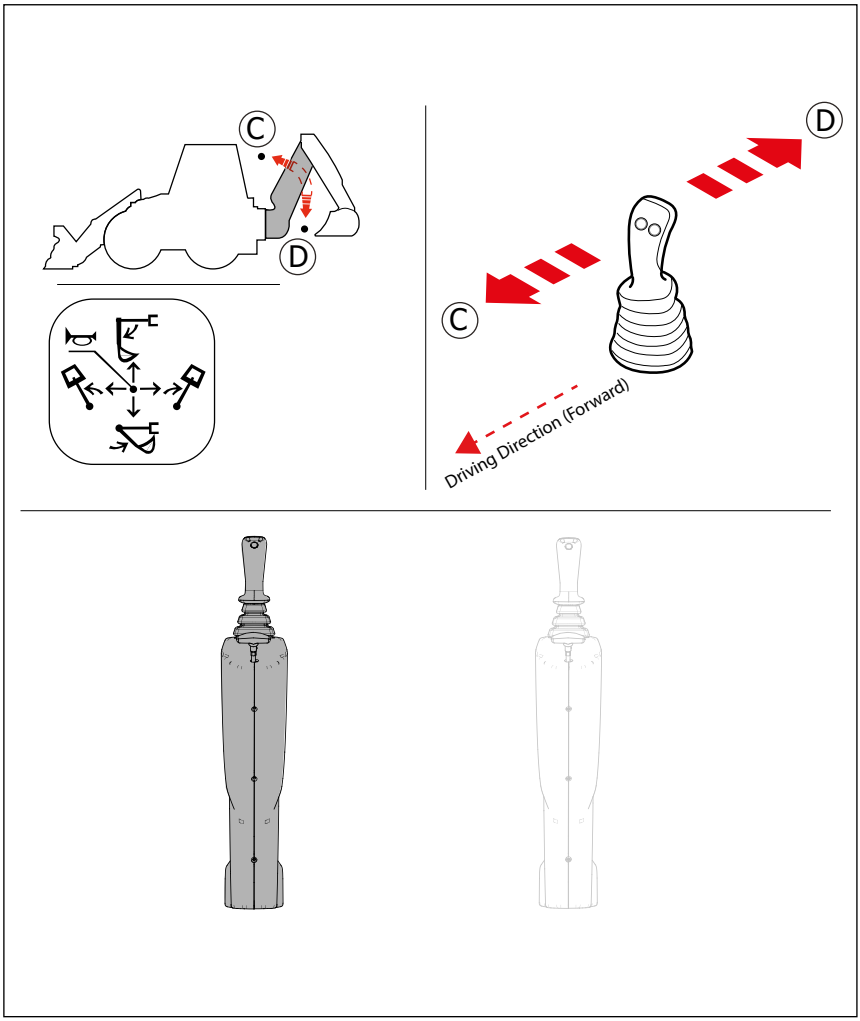
3.1.19 Backhoe Control Arms (Joystick Type - Husco)

Slewing the Boom



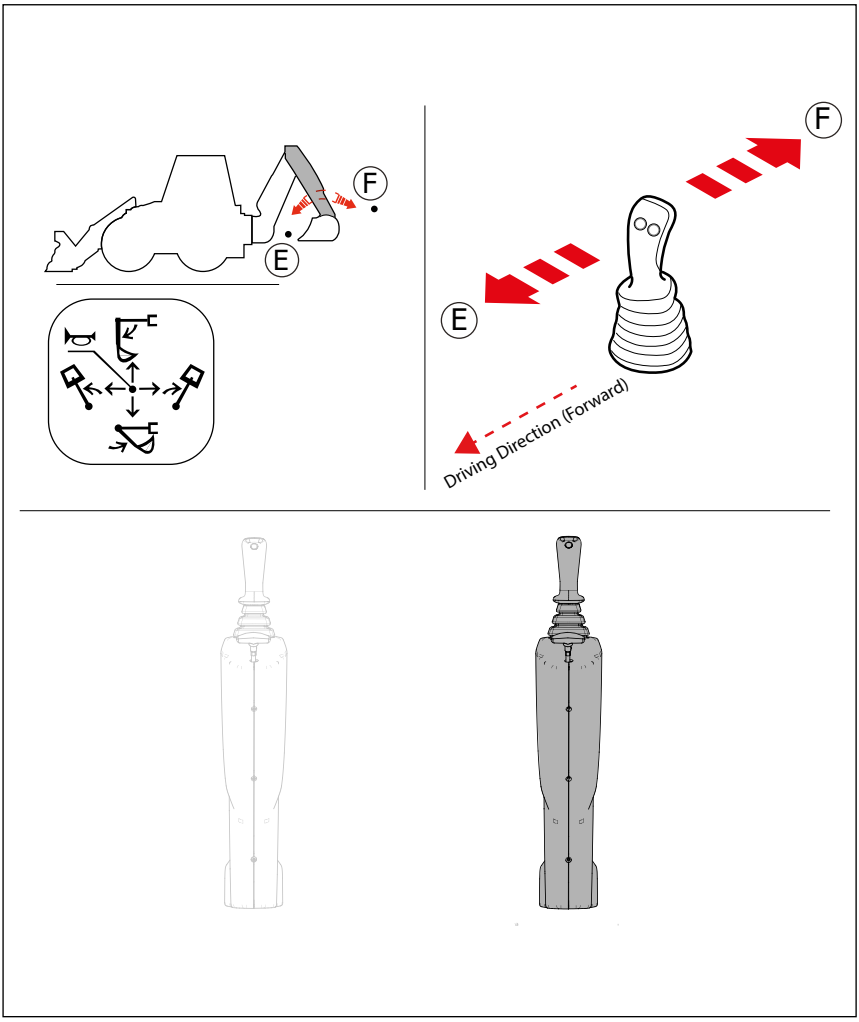
To slew the boom to your right (**A**), move the joystick to your right. To slew the boom to your left (**B**), move the joystick to your left.

Raising - Lowering the Boom



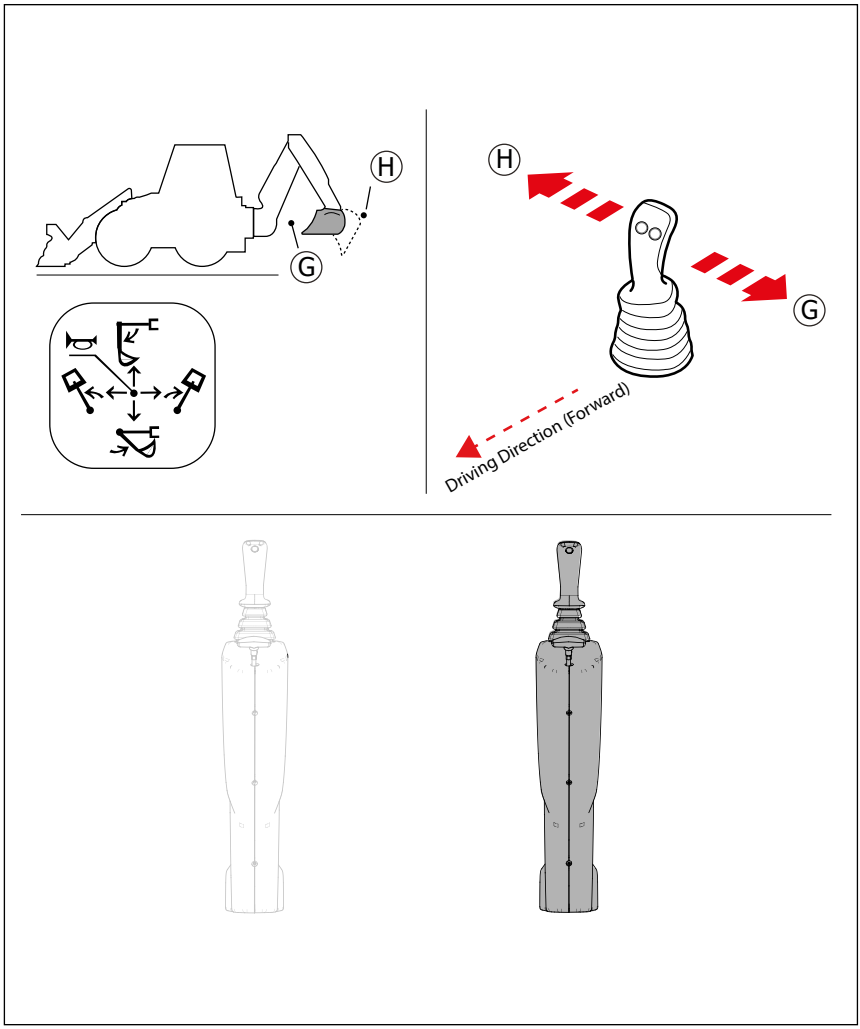
To raise the boom (**C**), pull the joystick towards you. To lower the boom (**D**), push the joystick forwards.

Bringing Dipper In - Out



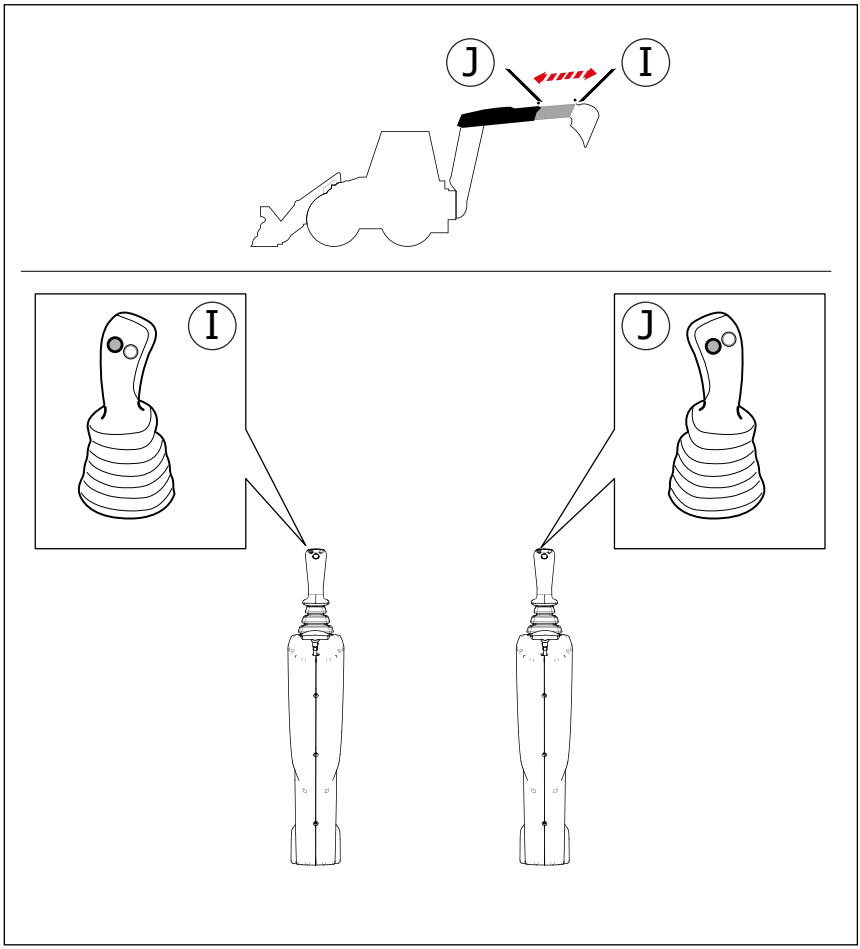
To bring the dipper in (**E**), pull the joystick towards you. To bring the dipper out (**F**), push the joystick forwards.

Opening - Closing the Backhoe Bucket



To close the bucket (**G**), move the joystick to your right. To open the bucket (**H**), move the joystick to your left.

Extracting - Retracting the Boom

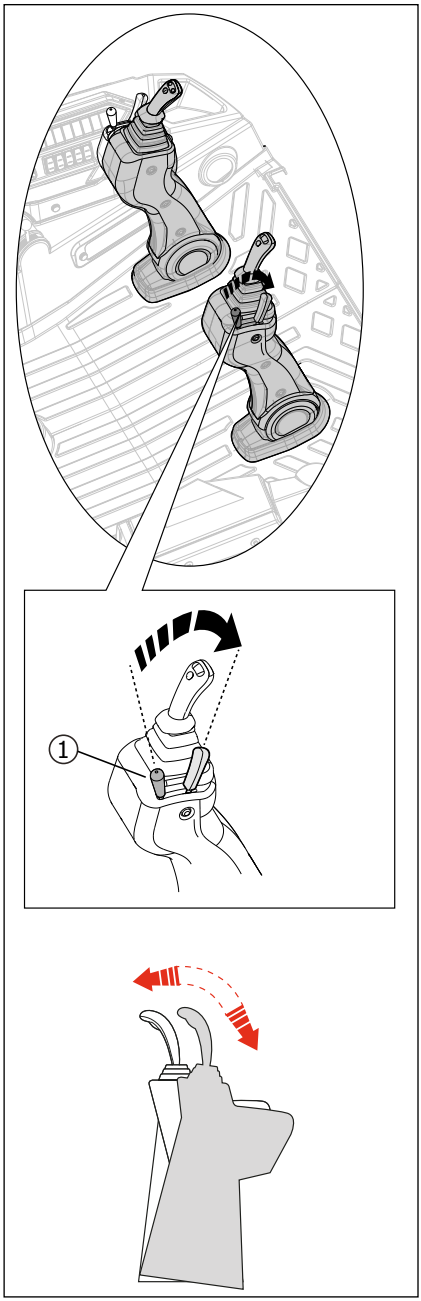


To extract dipper (**I**), push the left button on the left joystick. To retract dipper (**J**), push the left button on the right joystick.

⚠	WARNING

- Do not extend or retract the dipper while you are tearing out material.
- Do not exceed the working capacity of the backhoe at maximum reach.

Joystick Column Adjustment



The positions of the backhoe joystick columns can be adjusted to provide operator comfort and ease of use.

To change the position of the columns

Tighten and hold the spring handle (**1**) to adjust the position of the columns. Adjust the position of the columns.

Release the handle when it reaches the desired position. The column position will be fixed.

Column positions can be adjusted independently from each other.

⚠ WARNING
Do not change the position of the columns while driving / operating the machine.

3.1.20 Boom Lock

We recommend attaching the boom lock and rotary lock before traveling. Check daily that the boom lock is fully attached and the boom is secured.

⚠	WARNING
Operating the controls from outside the cabin may lead to death or serious injuries to you or others. Only operate the controls when sitting in the right position inside the cabin.	

Attaching the Boom Lock

It is recommended that the rotary lock is attached before attaching the boom lock.

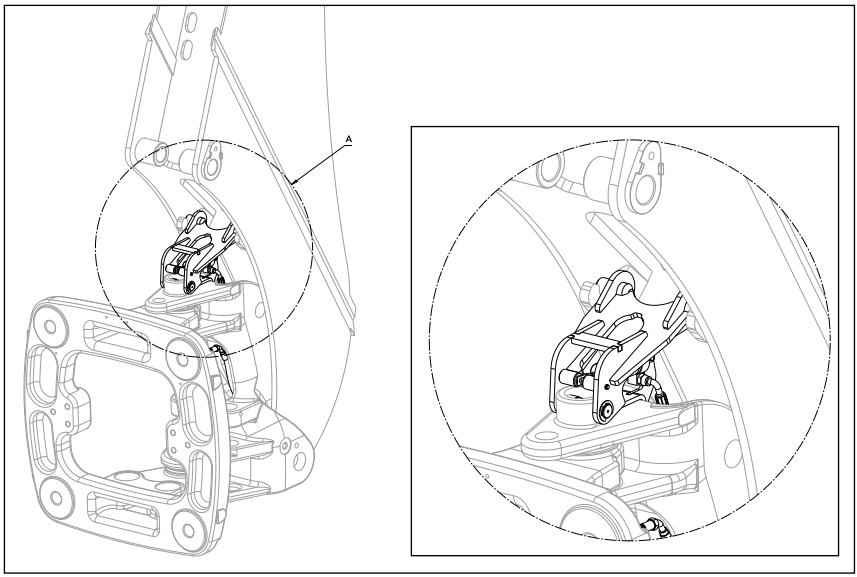
1-) Position the backhoe in full rear position and lower the boom.

2-) Activate the control switch in the cabin.

3-) Lift the Boom.

4-) Deactivate the control switch and make sure that the lock is fully interlocked with the boom lugs.

5-) Slightly lower the boom to tighten the lock.



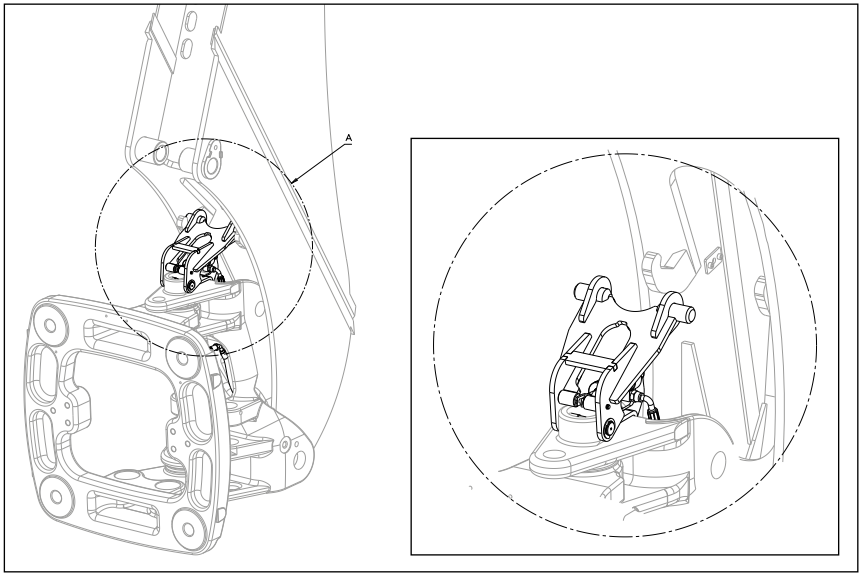
Opening the Boom Lock

1-) Slightly lift the boom to release the lock.

2-) Press and hold the boom lock switch inside the cabinet.

3-) Lower the boom.

4-) Release the boom lock switch.

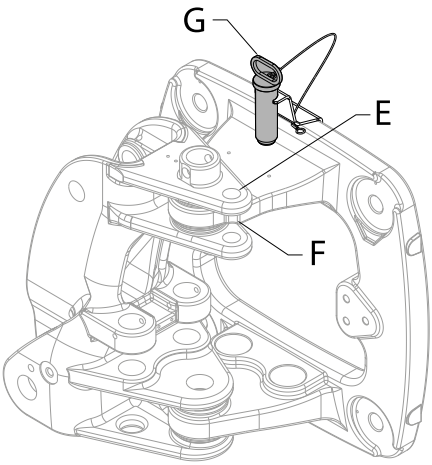


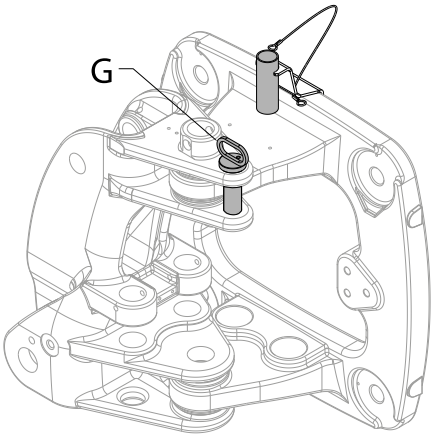
3.1.21 Rotary Lock

We recommend attaching the boom lock and rotary lock before traveling.

⚠	WARNING
Operating the controls from outside the cabin may lead to death or serious injuries to you or others. Only operate the controls when sitting in the right position inside the cabin. If this will be done by two people, make sure the person operating the controls is a qualified operator. Moving the wrong control stick or using the controls roughly may lead to death or injury of the other person.	

It is recommended that the rotary lock is attached before attaching the boom lock.



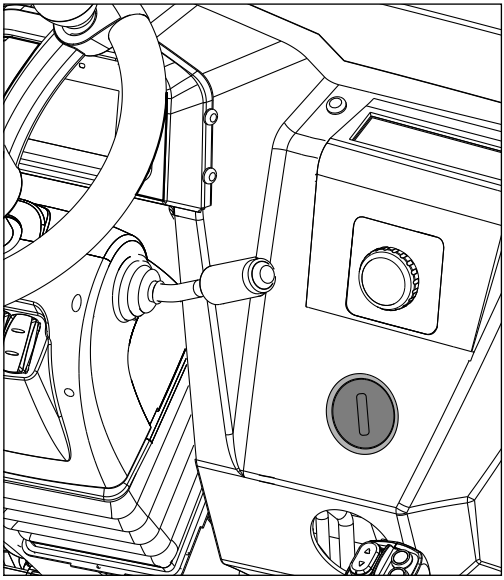


4 Operation Information

4.1 Steering Modes

You can move the machine in 3 individual steering modes depending on working conditions.

Use the switch located on the right side of the indicator panel to select "A" crab walk, for "B" 2WS and "C" for 4WS steering positions.



⚠	WARNING
To identify the steering mode during driving, check the warning lights on the indicator panel.	

A

Crab Drive
Front and rear wheels turn simultaneously. This position will improve maneuverability in limited space.

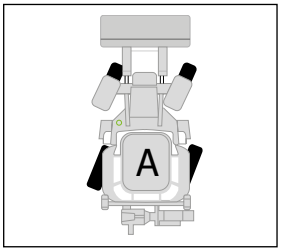
B

2WS Drive
The steering system will only turn the front wheels. Use this mode when driving in public places.

C

4WS Drive
The front and rear wheels will turn in the opposite direction. This position provides very sharp turns.

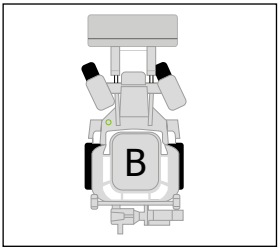
4.1.1 Crab Mode



In this steering mode front and rear wheels turn simultaneously. This position provides the narrowest angle of sight.

◯	OPTIONAL SPECIFICATION
Some features specified in this section are only for vehicles with 4WS mode.	

4.1.2 2WD Wheel Steering Mode

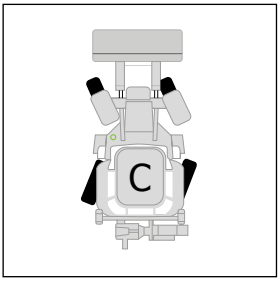


In this mode, the steering wheel will only turn the front wheels.

WARNING

When traveling in roads open to public, 2WS mode should be used.

4.1.3 4WD Wheel Steering Mode



In this mode the front and rear wheels will turn in opposite directions. This position increases the maneuverability in limited places.

INFORMATION

To identify the steering mode during driving, check the warning lights on the indicator panel.

DANGER

- Do not change the steering mode during driving. To change the mode, the machine should be stopped.
- Change the steering mode only when the engine is in idle.
- Don’t switch directly from crab to 4WS mode or vice versa. First switch to 2WS for at least for 5 sec.
- To be sure that the front and rear tires are aligned turn the steering wheel up to the end and back to the central position.
- After that you can change the steering mode.

DANGER

Use the steering mode switch at least once a day. Otherwise the steering wheel system will lose its driving efficiency.

4.2 Before Starting the Engine

1. Engage the parking brake.

Before starting the engine, engage the parking brake.

2. Lower the attachments

Ensure that the loader and the backhoe are on the ground or the backhoe is in transport position.

> ⚠ DANGER
>
> Make sure there aren't people on or around the machine before lowering the attachments. People on or around the vehicle may be injured under the attachments or trapped between the joints.

3. Check the machine externally.

Check for any damage on the ROPS/FOPS. If damaged, consult an authorized service and have it repaired. Make sure all nuts are attached and correctly tightened.

4. Check the cabin interior.

- Clean any oil, grease and mud on the pedals, control sticks and the steering wheel.
  Make sure your hands and shoes are clean and dry.
- Keep the machine's controls clean and dry. Your hands and feet may slip on wet control surfaces. This may lead you to lose control of the machine.
- Take out items such as lunch boxes, maintenance kits that may move freely inside the cabin or secure them. Objects randomly placed in the cabin may fall on you or roll on the floor. A falling object may lead you to faint or cause the controls to be jammed. In this case you may lose the control of the machine.
- Check for any loose or missing nuts and bolts inside the cabin.

5. Adjust the steering wheel.

Adjust the steering wheel position to reach all controllers easily and without needing to reach out for any of them.

6.Adjust the operator seat as required.

Adjust the operator seat to be able to reach all driving controllers and have a clear vision through the windshield and rear window. You must be able to push the brake pedal to its base while leaning back to the seat's backrest.

4.2.1 Adjusting the Operator Seat

Operator seat can be adjusted up to personal comfort. Properly adjusted operator seat helps you to feel less tired. Adjust the operator seat to ensure all switches can be reached easily. Adjust the seat position to ensure brake pedal can be pressed easily when in backrest position.

A **Arm Rest**

Alignment of the armrest can be adjusted. To lower the armrest, turn the knob counter-clockwise.

B **Forward / Backward Slider**

Pull the arm towards you to move the seat forward or backward. Release the arm to lock the position of the seat.

C **Damper Control**

To adjust the stiffness of your ride to soft, medium or hard. To increase stiffness, turn the knob counter-clockwise. To decrease stiffness, turn the knob counter-clockwise.

D **Manual Weight Adjustment**

To adjust the suspension to suit your weight. Pull-out to inflate. Push-into deflate suspension.

E **Rotation Arm**

Raise the arm to rotate the seat. Seat position is locked when it is full rotated. Release the arm when it is in backward position.

F **Backrest Angle**

Lean on fully seat backrest. Raise the control arm and adjust the angle of the backrest and then release the arm.

G **Headrest**

The headrest can be adjusted in up and down position.

7. Adjust the rear view mirror.

Adjust the rear view mirrors to see each side of the machine clearly when sitting on the operator seat in upright position.

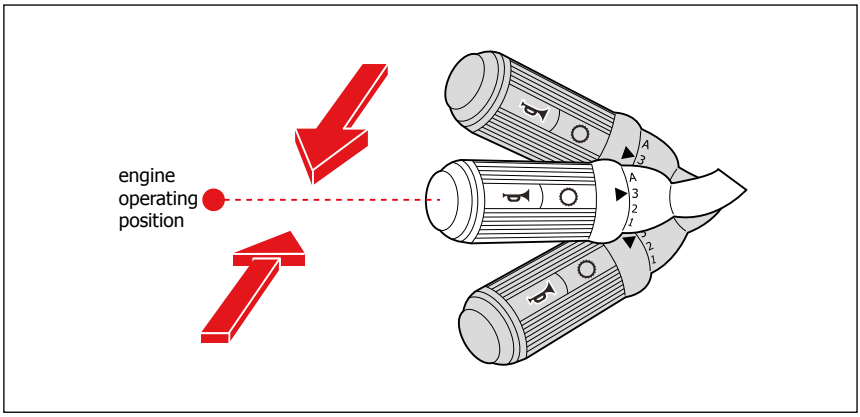
8. Check the seat belt and put it on.

Insert the latch of the seat belt in the slot and hear the click sound. Ensure that the belt is not twisted or folded when put on. Do not use worn or damaged seat belts.

4.3 Starting the Engine

1. Set the gear selector to neutral.

Before starting the engine, place the gear selector to neutral. For security reasons, the engine won't start when a gear is selected.



2. Get the hand throttle to the lowest level.

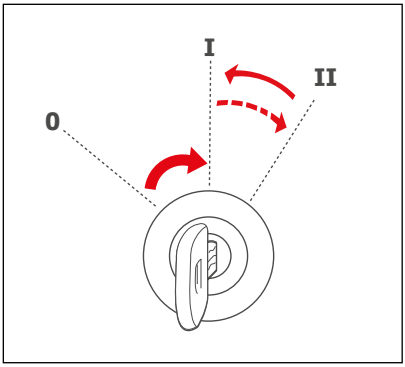
Before starting the engine, get the hand throttle to the lowest level.

3. Start up the engine.

Before starting the engine, place the gear selector to neutral. For security reasons, the engine won't start when a gear is selected.

WARNING

If any of the warning lights do not turn off or
Remains lighted when the engine is working, stop the engine as safely soon as possible.



- Slightly push the gas pedal.
- Turn the ignition key to **"II"** position and hold it until the engine starts. Release the key when the engine starts.

WARNING

If the engine does not start in 20 seconds, release the key. Wait for two minutes before trying again. This will allow the starter engine to cool down. Release the key as soon as the engine starts. The key will go back to **I** position.

INFORMATION

If the outside temperature is at 0 °C (32 °F) or lower, switch the ignition key to position **II** and wait for 10 seconds. Then start the engine.

- Start the backhoe once to help warm up the hydraulic system.

WARNING

The new engines DO NOT require running in. The machine/engine must be used immediately in normal operating pace. Attempting to run the engine in will cause scouring on the piston cylinder surfaces, which will lead to high oil consumption. Do not allow the vehicle to operate at idle (Example: no-load warm-up) for extended periods.

4.4 Preparing the Machine for Travel

There are local rules and safety directives stipulating the machine's travel position while traveling on the road or within the worksite. The "Road Travel Position" and "Worksite Travel Position" in the following pages are recommendations to help comply with the relevant rules. These are not necessarily for the applicable laws.

⚠ DANGER

Make sure that you and your machine fully comply with the applicable local laws before traveling on the road or in the worksite. This is your responsibility.

- The backhoe can be switched to one of the two
- Traveling positions when traveling on the road or in the worksite.
- "Retracted" position, i.e., the digger is placed crossway in the back of the vehicle, as shown in figure (A).
- "Extending from the Centre" position, i.e., the backhoe extends from the center and behind the vehicle, as shown in figure. (B) (All center-mounted machines must travel in "extending from the center" position.)
- "Extending from the Centre" position, i.e., the backhoe extends from the center and behind the vehicle, as shown in figure. (B) (All center-mounted machines must travel in "extending from the center" position.)

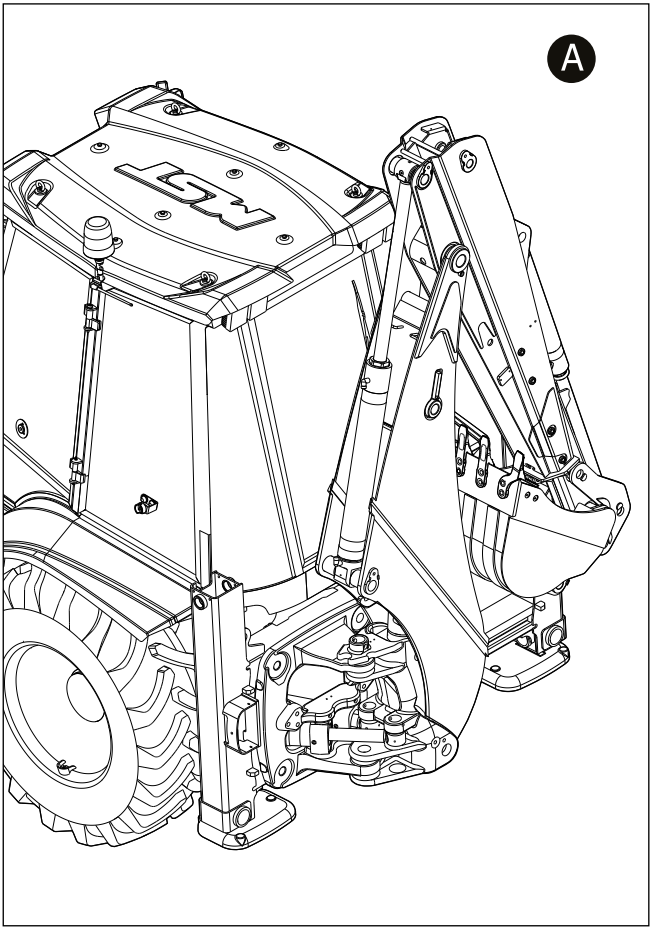
4.4.1 Backhoe Equipment

Make sure all attachments are detached before traveling. If you are driving the Machine with the attachments on, the conditions listed under the titles "retracted position" and "Extending from the Center Position" must be observed.

Retracted Position

- The machine total maximum width should not exceed 2.5 meters with attachments. If any parts are extending from the outer edge of the frame, you must mark these parts with red and white stripes to indicate a possible danger.
- The boom lock must be securely attached.

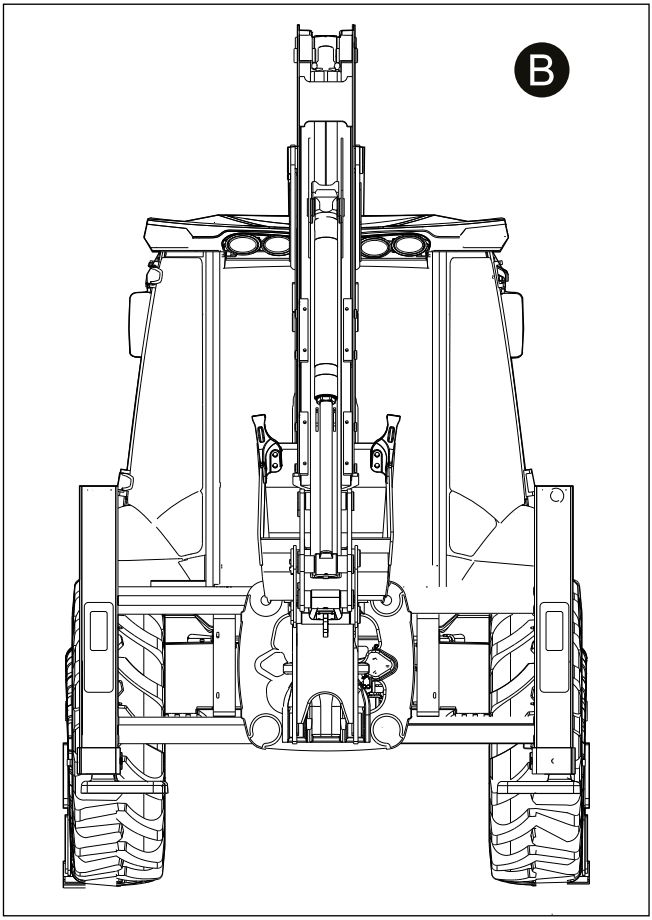
- The swing lock of the machine should be placed.
- In certain regions, it is necessary to attach to the shovel cylinder a safety prop.
- Attachments should not extend more than 1 meter behind the machine. If the attachments extending more than 1 meter, place a warning sign. If the attachment is detached, the rotary connection point must be secured.
- Keep the machine in balance.
- The stop/rear/signal lamps on the back of the machine (on both sides) must be visible.
- Hydraulic straps must be attached.



Extending from the Center Position

- Attachments should not unbalance the machine. In other words, at least 20% of the Machine's total weight must be carried by the front axle.
- The backhoe should be in the middle position in the rear frame and secured with hydraulic strap. (Applies to sliding machines only.)
- The boom lock must be securely attached.

An extension plate/lamp must be attached If the attachment is detached, the rotary connection point must be secured.



Travel Position on the Road

Read and understand the information in the previous page. The information provided below is intended as recommendation and does NOT necessarily refer to the applicable laws. Please observe the applicable local laws at all times.

⚠ WARNING
Machines without headlights and blinkers on the road are intended for site use only. Using machines without headlights and blinkers on the road may constitute breach of local laws.

- If the backhoe shovel is not attached to the machine, secure it by placing into the loader's shovel. If it is attached, secure it as shown in the image.
- If the backhoe shovel is not attached to the machine, secure it by placing into the loader's shovel. If it is attached, secure it as shown in the image.

It is the driver's responsibility to observe the Land Vehicle Regulations. Below are some recommendations to serve as guidance.
Always determine beforehand if there are any bridges and similar structures that may be damaged by the machine on the intended route.

- Position the backhoe, to one of two possible options.
- Attach the boom and swing locks.
- If the rear backhoe is positioned at the center of the rear chassis, attach an extension plate/lamp on the strap. The plate lamp must be plugged in.
- Secure any attachments that are attached, for example, attach blade protection etc. . If loading fork is attached, put the fork to transport position.

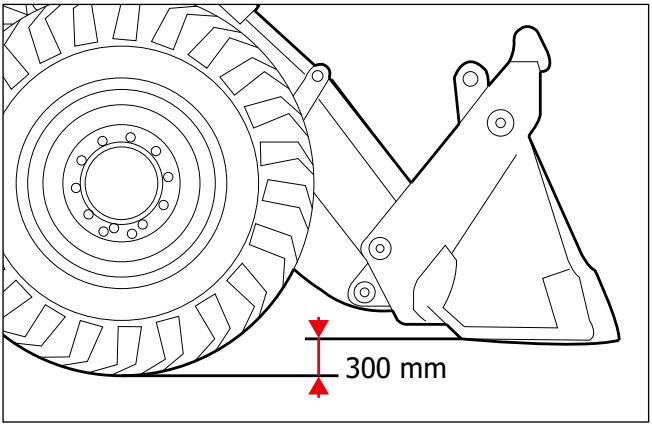
⚠ WARNING
In certain countries, it is illegal to travel without blade protection on the loader's shovel. Ensure compliance with the applicable laws in your region.

- The stop lights must light up when the brakes are used.
- Select the 2WS mode during travel for all machine models, including 4-wheel steering machines.
- Turn on the warning light.
- Check that the lights, including headlights and flashers, are functional and clearly visible. Do not use the vehicle if any of the two stop lights are not functioning properly.

Travel position in the Worksite

The information provided below is intended as recommendation and does not necessarily refer to the applicable laws. Please observe the local laws at all times.

- Fully reverse the bucket. Lift the loader shovel to 300 mm above the road surface, as shown in C.
- Position the backhoe, to one of two possible options.
- Secure any attachments that are attached. Keep the forks in stacking position if not used to carry load.
- Attach the boom lock and the swing lock.
- The stabilizers must be fully lifted, check it.
- For 4 wheel steering machines: Select the steering mode suitable for the work and the terrain.
- Select the drive mode suitable for the work and the terrain.



4.5 Using Attachments and Work Site Safety

In this section, the technical information required for using the machine safely at the site and efficient use of attachments are provided. Read and understand this section before operating the machine. Read this section and practice using the attachments until you fully learn the controls and their functions.

Notify your colleagues what you will do and where you will do it before starting to use the machine. Use a signaler during busy work times in the worksite.

Remember the machine is a vehicle capable of traveling. Where possible, move the machine in a position to combine efficiency and safety. If you have to choose between efficiency and safety, remember this :

SAFETY COMES FIRST.

Select the attachments suitable for the work. Do not use overly large shovel for rocky materials. Otherwise, the system will be overloaded and the service life reduced.

⚠ DANGER

General Worksite Safety

Examine the work place before operating the machine. If the ground below the Machine collapses or the piled materials fall over the Machine, it may lead to your death or injury. Check for holes and invisible residues, logs, iron objects etc. in the vicinity. Any one of such items may cause you to lose the Machine's control.

⚠ DANGER

Legal Liability

You and/or your company may be held legally liable for any damage caused on public utilities. It is your responsibility to be aware of the location of any cable or pipe in public utilities that may be damaged by the Machine.

Water Pipes and Pipe Drains

Contact the water administration and learn about any underground pipes or pipe drains in the worksite before working with the machine. If there are any pipes or pipe drains, attain a map showing their location and follow the instructions provided by water administration.
We advise you to ensure that the safety precautions in the worksite comply with the local laws and regulations on working in the vicinity of underground water pipes and pipe drains.

Electricity Power Lines

If you get too close to power lines with the machine and its attachments, you may get electrocuted and severely injured. We advise you to ensure that the safety precautions in the worksite comply with the local laws and regulations on working in the vicinity of power lines.

- Underground Power Lines; Contact the power administration to learn whether there are any underground power cables in the worksite before working with the machine.
- Overhead Power Lines; When working under overhead power lines, you must keep a minimum distance between the Machine and the line. You may consult the local power administration for detailed information.

⚠ DANGER

New Work in Old Worksites

There may be hazardous materials buried in the worksite, such as asbestos, poisonous chemicals and similar hazardous objects. If you remove any contains or encounter any signs of toxic residues underground, stop the machine and immediately inform the worksite manager.

DANGER

Communication

Inefficient communication may lead to accidents. If two or more persons are working with the machine, each person must be aware of the others' work. Make sure the other persons are not in dangerous areas before starting the engine. Dangerous areas include: Circular blades on the engine and the band, attachments and connections and any place under and behind the machine. Failure to observe these precautions may result in death or injury to persons.

Safety Barricades

Unsecured machines in public places may constitute hazard. In public places or when the line of sight is reduced, place barricades around the Machine to keep people away from the Machine.

DANGER

Worksites

Worksites may be hazardous places. Examine the work site before starting to work. Check for any holes, loose ground, covered rocks etc. in the environment. Check for any infrastructure utilities, such as power cables (underground and overhead), gas and water pipes etc. Mark the location of any underground cables and pipes. Leave sufficient distance between the machine and overhead lines and structures.

Trial

Performing trials beforehand on the work you are not familiar which may prevent the death or injury to you or to others. Perform such trials away from the worksite in open terrain. Make sure there are no people in the vicinity. Do not attempt to carry out the work until you are certain that it can be done safely.

DANGER

Underground Gas Pipes

Contact the local gas company and check for any underground gas pipes before working with the machine.

If there are any gas pipes, ask the gas company for information on how to carry out work in such areas. Some of the modern gas pipes cannot be detected by metal detectors.

For this reason, before starting any excavation works, it is imperative to attain a map showing the underground gas pipes' exact location. To determine the exact location of the pipes, drill trial holes manually. Assume any cast iron pipe you encounter as gas pipe until it is proven otherwise.

Old gas pipes may be damaged by heavy vehicles moving on the ground above.

LEAKED GASES ARE EXTREMELY VOLATILE

If you suspect a gas leak, immediately contact the local gas administration and alert all personnel in the worksite. Ban smoking, ensure all fires are extinguished and stop all engines.

We strongly advise you to ensure that the safety precautions in the worksite comply with the local laws and regulations on working in the vicinity of underground gas pipes.

Hillsides

It may be dangerous to operate the machine on hillsides without proper precautions. Ground conditions may vary with rain, snow, icing etc. Carefully check the work site. Drive the machine in the first gear in rough terrain, keep any attachments close to the ground. Do not, under any circumstance, drive down the hill by stopping the engine or shifting to neutral gear.

4.6 Working with the Loader

Working Practice

To use the MST Backhoe-Loader machine properly and safely, you must be familiar with it and possess the necessary skills to operate the machine. This manual will teach you about machine, its controls and safe operation. This manual is not intended to provide training on loading operations. If you are a new operator, you must receive training to use MST backhoe-loader before operating the machine. Otherwise, you will be unable to carry out the work and endanger yourself and others.

Remember that, when using the loader, you will also be driving the machine. Be cautious and aware of possible dangers and people standing close. Remain in the correct driving position. Keep the seat belt fastened.

When working with the loader, keep the backhoe in straight position behind the machine, similar to the traveling position.
Keep the loader's shovel close to the ground during the journey. This will give you a better vision and provide a good balance for the machine.

If possible, drive down the slopes with the loader shovel in reverse gear. Use forward gear when climbing slopes. Do not exceed 8 kilometers per hour when carrying very heavy loads with the shovel.

Loading the Loader Shovel

⚠ DANGER
When loading from a high platform or pile, remove the protruding parts first. Be careful with slides. Dropping the protruding material may cause you or the machine to be buried under

On hard terrain, set the shovel in free position. When the shovel penetrates the heap, lift and tip backwards at the same time. This will allow the shovel to pick up the material when rising towards the top of the heap.

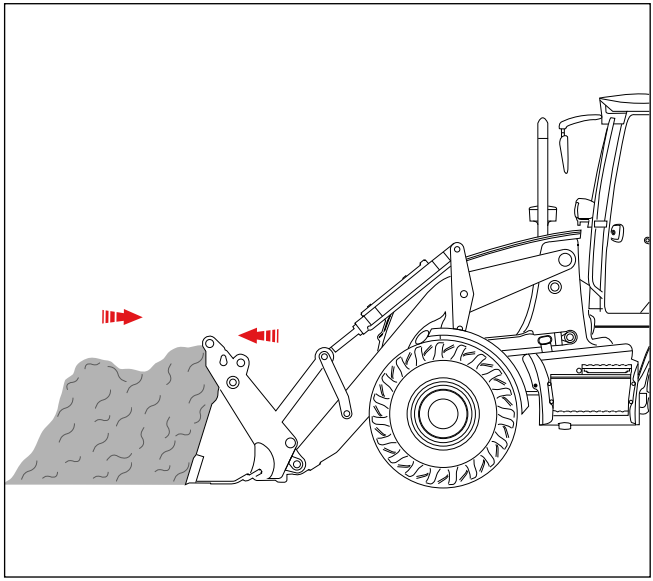
When moving into a heap, push the "hydraulic speed control switch" to provide more traction force to the loader.

Push the "Declutch" button on the front joystick to transfer more power to the loader and quicken your work. Try to fill the shovel in the first attempt. Half loaded shovels offer low efficiency.

When transporting the material, pull back the shovel fully to prevent spilling and dropping the material.
If you are loading a heap of loose material, start from the bottom and follow the heap's surface, as shown in the figure. Approach the heap by keeping the shovel straight and close to ground.

When working on compressed material, start from the top towards the bottom.

When taking materials from large heap's, start by leaving distance from the ground equal to the height of the shovel. When the heap's height is reduced, start loading from the bottom.



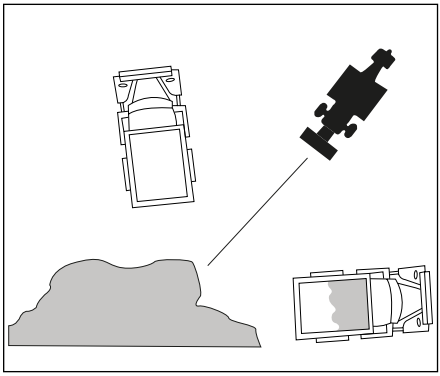
Loading the Truck

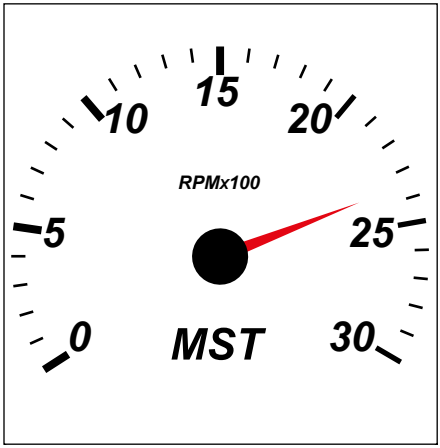
Position the truck with approximately 45° angle, as shown in the figure. This will reduce unnecessary maneuvering. Leave sufficient distance to ensure that the shovel will reach the unloading height without slowing the Machine down.

Make sure the wind is blowing from behind. This will prevent dust from blowing onto you and the machine.
Get the machine as close to the truck as possible before unloading the material.

If the truck haulage is equal in width to the shovel, discharge the material in the middle. If the haulage is twice the size or wider than the shovel, fill the front side first.

Do not discharge the material in a single and sudden movement. Tip the shovel forward progressively until the material is discharged. Use the control stick to move the shovel forward and back to drop sticky materials.

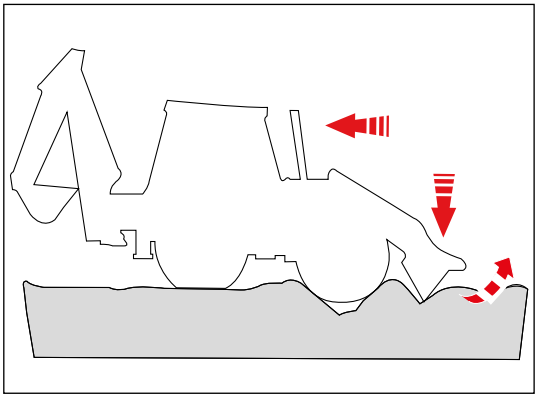




Rescuing the Machine When Stuck

If the machine is stuck in the heap, use the bucket to get it out. Shift the gear selector in neutral and turn the shovel over forward as shown in the figure.

Lift up the front wheels by selecting the low position of the shovel. When the front wheels are saved, slowly return the shovel to push the vehicle backwards. When the front wheels are on solid ground, switch to reverse gear and drive away from the ditch.



4.7 Working with the Backhoe

Working Practice

DANGER

You must render the machine a safe and stable working platform before using the backhoe. See the section on Preparing to Use the Backhoe in the OPERATION chapter.

To use the MST backhoe-loader properly and safely, you must be familiar with it and possess the necessary skills to operate the machine. This manual will teach you about machine, its controls and safe operation. This manual is not intended to provide training on excavation operations. If you are a new operator, you must receive training to use MST backhoe-loader before operating the machine. Otherwise, you will be unable to carry out the work and endanger yourself and others.

If you are working with another worker, make sure you understand each other's work. Learn and use known signaling methods.

Preparing to Use the Backhoe

When selecting excavation position, avoid excavating downhill, if possible. Where possible, discharge the excavated material to the higher ground on the excavation site. These measures will help keep the machine in balance.

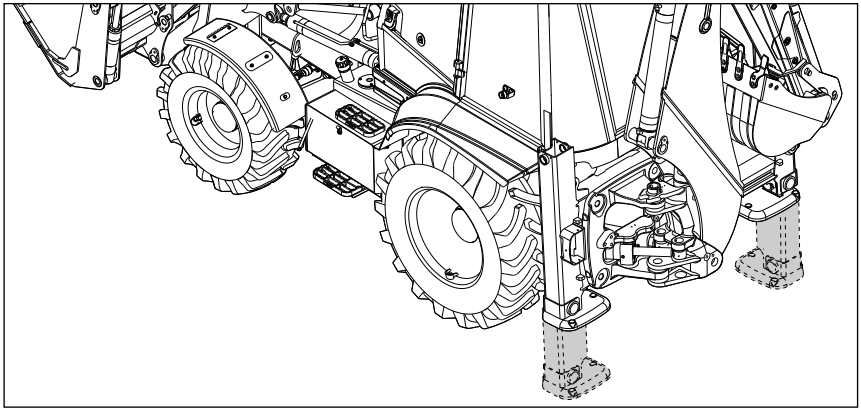
⚠ WARNING
Do not tip the shovel fully forward on asphalt surfaces. Keep the shovel's base horizontal on the ground. This will minimize damage to the surface. If a clamshell shovel is installed, do not load weight on the fork carrier.

1-) When the machine is in the desired position in the worksite, tip the shovel forward until it is parallel to the ground

2-) Shift the gear selector to neutral

3-) Pull the parking brake

4-) Turn the seat to face the backhoe. Ensure that the seat is locked in place. Then, lower the stabilizers until the rear wheels are slightly off the ground. Adjust the position of the stabilizer to ensure the machine to stand straight as shown in figure. Place strong stabilizer underneath in soft surfaces. This will provide distribution of the weight and stop the machine from being stuck in the ground.



Uninstalling the Bucket

Adjust the Backhoe Position

Set the backhoe to straight position in the back of the machine. Lean the bucket on the flat surface, as shown in the figure. To prevent motion chock it.

> ⚠ DANGER
>
> Stand on the side or away from the bucket when removing the joint pins. The bucket may fall off when the pins are removed.

Remove the Joint Pins

Remove the safety bolt B and detach the pin A. Follow the same procedure for both pins.

Retract the Backhoe Arm

Use the controls to carefully lift the backhoe arm and detach it from the bucket.

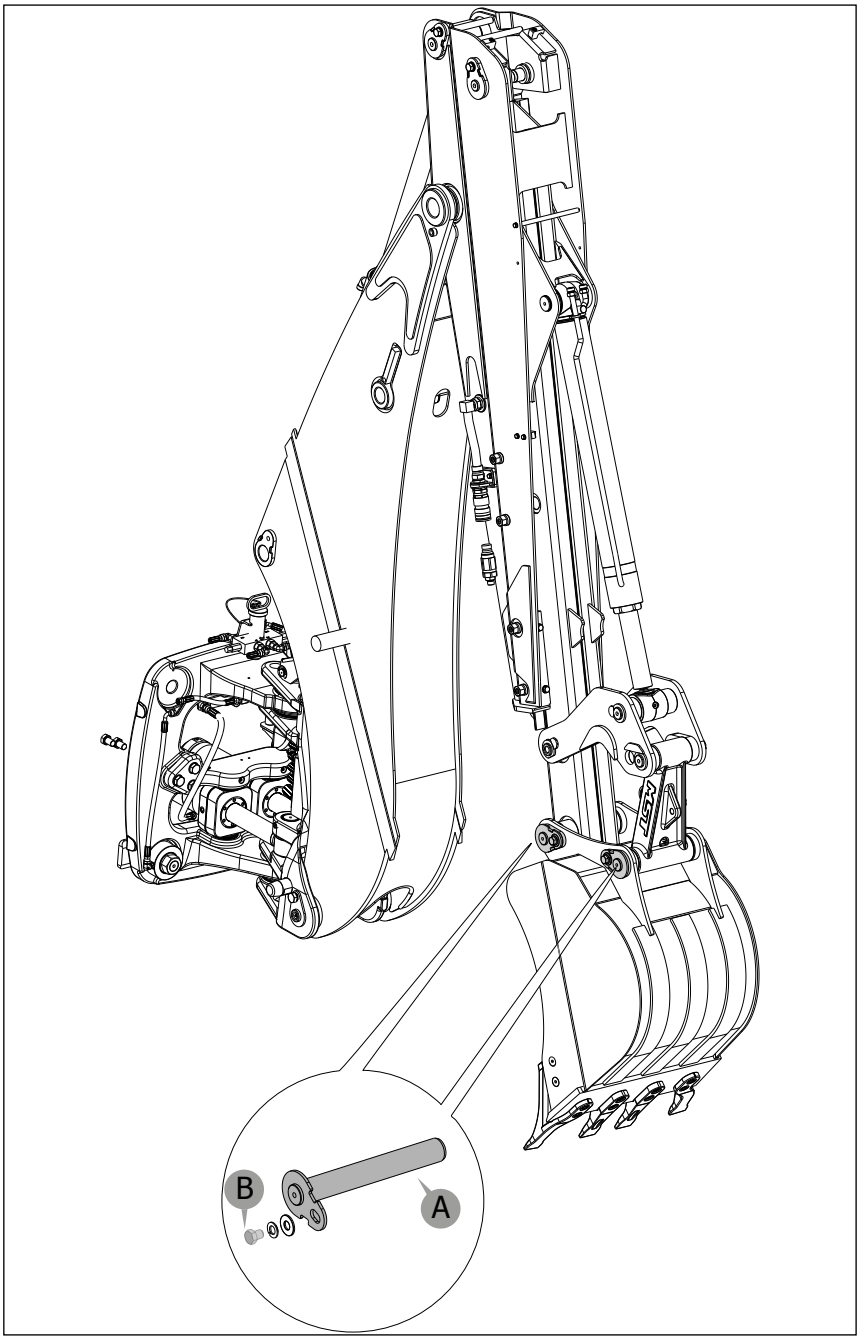
Installation the Bucket

Adjust the Backhoe Position

Use a suitable lifting machine to place the Backhoe Bucket to stand straight on level surface.

> ⚠ DANGER
>
> If this will be done by two people, make sure the person operating the controls is a qualified operator. Moving the wrong control joystick or using the controls roughly may lead to death or injury of the other person.

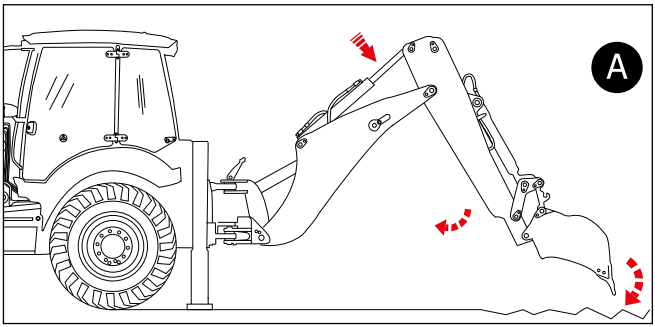
When aligning the end of the Backhoe arm B with the bucket pin connection holes pull the machine back.


B
A

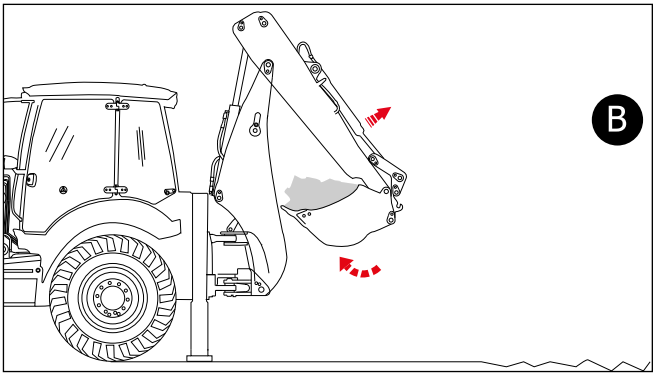
Attach the Backhoe Arm to the Bucket

Carefully operate the controls to align the end pin connection holes of the backhoe arm and the pin connection holes of the backhoe bucket and attach the safety pin A. Then, tighten the bolt B to secure the pin. Repeat the same procedure with the lever 6 and bucket connection.

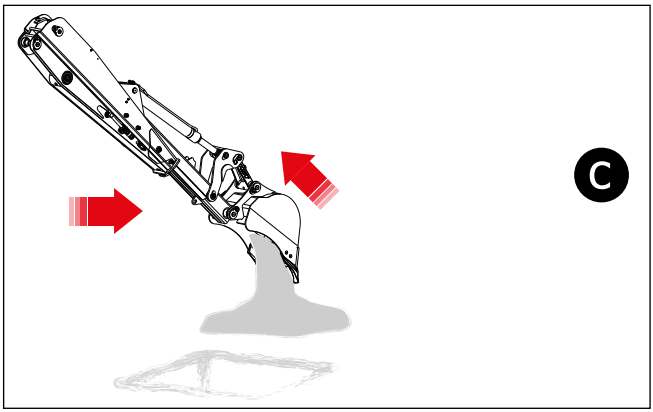
Excavation



To initiate excavation, extend the boom and the arm forward and move the backhoe bucket to the position as shown in figure A.
Close the backhoe bucket slowly and settle on the ground at the same time. Make sure the backhoe bucket's angle to the ground remains unchanged when retracted. If necessary, push the boom downwards to increase the excavation force.



When the bucket is full, close it completely and push slightly the dipper forward at the same time, as shown in figure B. This will prevent accumulation of the dirt under the machine.



As shown in C, turn the dipper towards where you will unload the dirt. Unload the dirt as the dipper approaches the pile. Do not waste time by piling far away from the digging area. Start piling on a place close to the place where you started digging. Taking the dipper back to digging area, keep on digging.

INFORMATION

This image shows a typical MST Backhoe-Loader Construction Vehicle. This may not be the same as your machine.

WARNING

Do not use the edges of the excavation hole to stop the bucket. This may damage the machine.
Fill the hole by loading earth into the bucket from the heap. Do not push the earth with the edge of the bucket.

Side Sliding the Backhoe

Before sliding the backhoe, clear any dirt or soil on the sliders.

1-) Use the stabilizers to adjust the machine's level.

2-) Lean the bucket straight on the ground behind the machine, as shown in the figure.

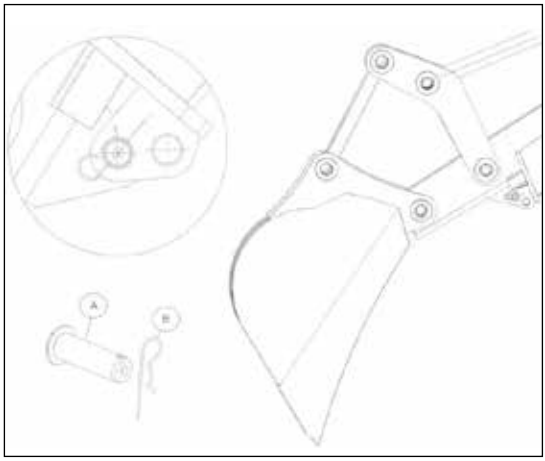
3-) Unlock the clamping cylinders by pushing the button the indicator panel. The light on the button must illuminate.

4-) In order to loosen them fully, move the boom up and down a few times.

5-) Lift the backhoe as shown in C and turn directly to one side of the machine. To slide right, turn it to the left. To slide left, turn it right. Lean the backhoe bucket on the boom with 90 degree angle, as shown in the figure.

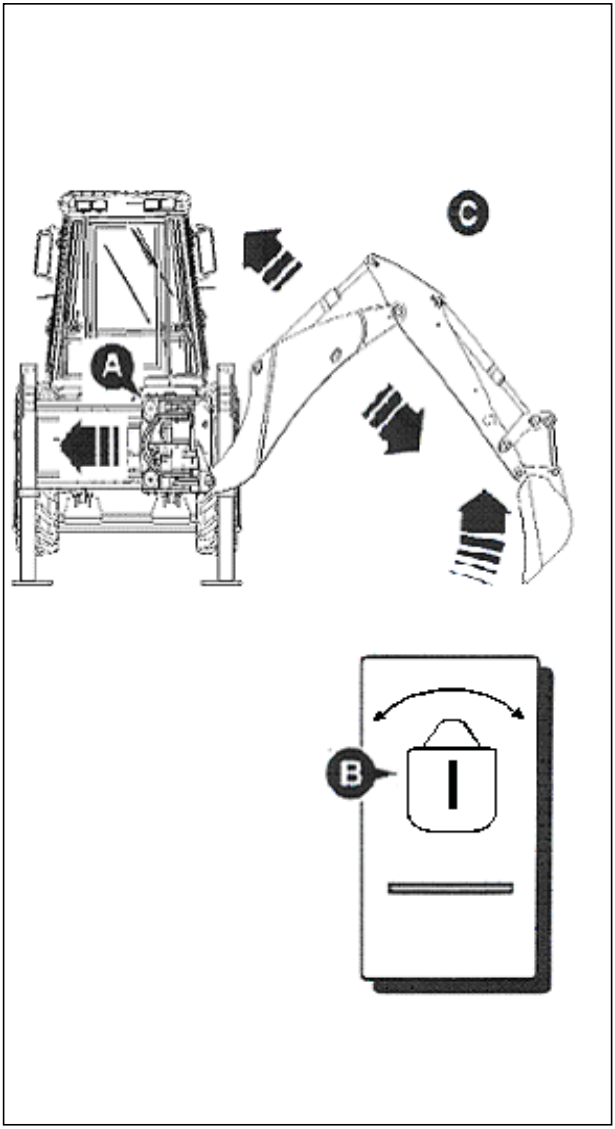
6-) Open the bucket. When the bucket is opening, the turning is pushed to the back of the machine. If the turning A gets stuck halfway, slightly raise or lower the boom to keep the turn vertical on the rails.

7-) Once the backhoe is in desired position, push the kingpost clamp button, shown as B, to "**OFF**" position and lock the clamping cylinders.



OPERATION INFORMATION

⚠	WARNING
The pressure generated at the backhoe circuits will ensure the clamping cylinders to be completely locked. Before operating the backhoe, move the bucket control stick until the bucket is fully closed and keep it in this position for at least five seconds. (Machine is at 1500 rpm).	



Using the Telescopic Arm (If Attached)

The Telescopic Arm allows you to reach greater distance when digging and discharging. You must unlock the telescoping arm before use.

⚠ DANGER

Fully retract and lock in place the backhoe arm when additional excavation is not required or attachments other than the bucket are attached.

- Fully retract the telescopic arm.
- Place the locking pin in its slot.
- Attach the pin locking latch to the pin hole

⚠ WARNING

You must observe the following precautions when using the telescopic arm in fully extended position. Failure to take these precautions may unbalance or damage the Machine.

- Make sure backhoe's operating capacity is not exceeded in maximum reach.
- When the backhoe is shifted sideways, be careful when turning to the same side. Turn the backhoe slowly to prevent destabilizing the Machine. For the same reason, avoid discharging downhill, if possible.
- Do not extend and retract the telescopic arm in the excavation site.

Lifting with the Backhoe

The Machine owner and/or operator must ensure they fully understand the laws and regulations relating to the use of MST backhoe-loader for earthmoving or as a crane. Consult an authorized service for more information.

If your machine is not attached with an lifting point such as certified hook or loop, the Machine should not be used as a crane. Use the machine for excavation works only.

If an authorized lifting point is attached to the Machine, such as a hook or loop, it can be used as a crane, provided it is tested for safe operating range, documented and certified and complies with all other requirements of applicable regulations.

Always use lifting gear that adequately robust and in good condition. Check the load's weight when selecting the lifting chains.

A bucket must be attached to lift loads with the backhoe. Make sure the load does not exceed the bucket's safe operating weight.

Work with a signaler when lifting loads with the backhoe. Make sure both of you understand and use the accepted signs.

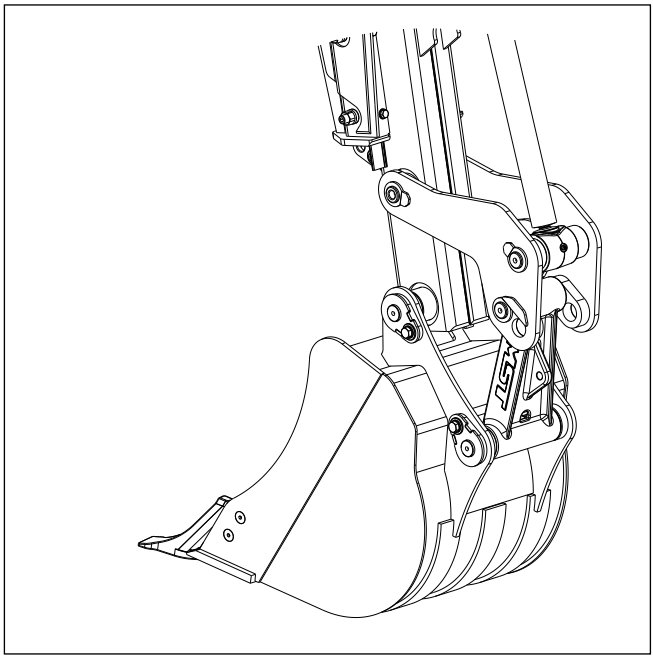
Attach a fixing cable on the load. Ensure that the person holding the cable is standing away from the load and the machine. Lift the load 25-30 millimeters off the ground and test it by moving slowly over the surface using the backhoe controls.

When the load is on the backhoe, ensure there are no persons close to the load and the Machine.
Lower the load to the ground if you sense any instability on the load or the machine.

Failure to observe these precautions may result in death or injury.

- Set the machine to the correct position; see the section preparing to Use the Backhoe.
- Attach the lifting chains to the hook A. Keep the chain as short as possible to avoid swinging. Start lifting with the bucket closed. Bring the backhoe arm close to the boom

- Open the bucket slowly, lift and move the load forward. Move the backhoe arm forward to lift the load up. Open the bucket to adjust the height precisely.
- Lower the load by retracting the backhoe arm.



4.8 Operating in Cold and Hot Temperature

Operating at Cold Temperatures

Apply the following precautions when working in cold weather conditions. These precautions will allow the machine to operate more easily and prevent any possible damage to the machine

1-) Use an engine oil with the right viscosity.

2-) Use low temperature diesel fuel, if possible

3-) Use the right coolant mixture.

4-) Keep the battery fully charged.

5-) Fill the fuel tank after each work period. This will help prevent condensation on the tank's walls.

6-) Keep the machine protected when not in use. Park the vehicle in closed space and cover it with tarp.

7-) Use assistive elements to start the engine in cold weather. You may need to start the engine using assistive substances in very cold weather, such as -18 C° or lower temperatures. The examples of such substances include fuel, oil and coolant calefaction substances. Consult your dealer for more information.

8-) Clear any snow on the hood's air intake section before starting the engine; otherwise, the air cleaner may take in snow.

Operating at Hot Temperatures

Apply the following precautions when working in hot weather to prevent any possible damage to the machine.

1-) Use an engine oil with the right viscosity.

2-) Use the right coolant mixture.

3-) Regularly check the coolant system. Keep the radiator water at the correct level. Make sure there is no leakage.

4-) Keep the radiator clean, regularly clear any dirt and residue on the radiator and the engine.

5-) Regularly check the fan belt.

4.9 Stopping and Parking the Machine

Stop the machine at a dry and level place to avoid any hazard or accident. It is recommended to ensure there is enough parking space when parking the vehicle with the rear backhoe extended.

⚠ DANGER

If not parked properly, the Machine may move on its own without the operator. Follow the instructions in this manual to park the vehicle appropriately.

1-) Take your foot of the gas pedal and push the brake pedal down. The machine will stop softly. Keep pressing the brake pedals until the parking brake is pulled.

⚠ DANGER

Parking brakes should not be used to decelerate a moving machine except emergencies. Otherwise, the braking efficiency will be reduced. Replace both brake linings each time the parking brake is used in emergencies.

2-) Pull the brake lever up to full position. Make sure the parking brake indicator light is turned on. Take your feet of the brake.

⚠ DANGER

Do not try to get off from the moving vehicle.

3-) Shift the gear shift lever to Neutral. Ensure that the lever is within the locked position

4-) Lower the stabilizers down until they touch the ground.

⚠ DANGER

Make sure there are no people on and around the Machine before lowering the Attachments. People on or around the vehicle may be crushed under the attachments or trapped between the joints.

5-) Lower the loader arms and rear backhoe body. The rear backhoe must be moved to the position shown in A (shovel fully open, boom and shovel blades fully extended).

6-) It is recommended that turbo-charged engines are operated at 1000 rpm (approximately) with low load for 2-3 minutes before stopping the engine. This will allow the turbo charge to cool down.

7-) Make sure that all switches are turned off before leaving the Machine.

⚠ DANGER
Always face the machine when entering (and exiting) the cabin. Also, your shoes and hands must be clean and dry. Otherwise, you may slip and fall.

8-) Use the steps and handles to get off the vehicle. Attach the bolts on all windows and lock both doors. Make sure the radiator cover is locked.

9-) At the end of a work shift or when leaving the machine, where the headlights are not needed, remove the battery insulator key (if available), See Battery (See "**MAINTENANCE**" section.)

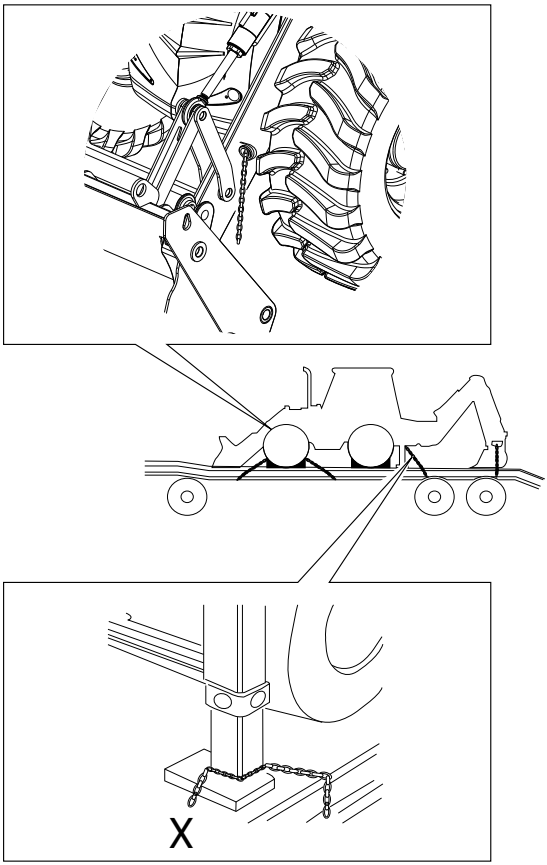
4.10 Transferring the Machine

DANGER

The shipment company and the driver is responsible for safety during transportation. All machines, apparatuses and parts that may move during shipment must be fixed properly.

WARNING

Before shipping the machine, make sure that you will not be violating any local laws and rules on the intended route of transport.



Make sure the shipping vehicle is appropriate, see the "TECHNICAL SPECIFICATIONS" section for the Machine's weight and sizes.

⚠ DANGER

Before loading the machine on the trailer, ensure that the trailer and its ramp are free of oil, grease and ice. Also clear any oil, grease and ice on the Machine's tires. Make sure the Machine can pass through the joining point between the ramp and the trailer. To see the machine's height off the ground, see the TECHNICAL SPECIFICATIONS chapter.

1-) Place Wedges under the Shipping Vehicle.

2-) Place wedges at the trailer's front and rear wheels

3-) Move the Machine on the Trailer

- Ensure the ramps are in correct position and are secured.
- Adjust the loader shovel and backhoe as described in the Preparing for Road Travel section (OPERATION chapter).
- Drive the machine carefully onto the trailer
- Pull the parking brake and shift the gear to neutral.
- Unlock the boom when the machine is safely in place. Lower the loader shovel and the backhoe to the trailer's floor. For the machines shifting sideways, lower the stabilizers. For the machines with central stand, secure the stabilizers to avoid movement during shipment.
- Place the swing lock.
- Check that the general height of the load conforms to the regulations. Adjust as necessary.
- Shut down the engine
- Shut down the engine
- Cover the exhaust tip.

⚠ WARNING

If the swing lock cannot be attached for any reason, the bucket must be securely connected to the trailer guide; if the bucket cannot be settled, then connect the tip of the dipper tightly to the trailer guide.

4-) Secure the Machine with Chains Place wedges on both sides of all four wheels. Tie the machine to the trailer using chains. The figure shows the chain connection spots, marked with X.

5-) Measure the Machine's Height. Measure the Machine's maximum height off the ground. Make sure the driver is informed of this height before moving out.

4.11 Transferring the Malfunctioning Machine

⚠ DANGER

Towing the machine to long distances or with high speed may damage the transmission. Tow the machine no more than 1.5 kilometers. If you have to tow the machine, prepare the machine as described below and do not exceed 25 kilometers per hour. Failure to observe these conditions will result in oil consumption or transmission malfunction.

Use a robust tow bar. If you have to use a towing chain, use two vehicles for towing. One of the towing vehicles must be connected to the front side of the malfunctioning machine. The second vehicle must be connected to the rear of the malfunctioning machine to serve as braking force.

The towing vehicle must have sufficient power to move and stop the machine.

Tow the machine only when there is no other option. Remember that towing may cause further damage to the machine. If possible, repair the machine on site. If you absolutely have to tow the machine, read the following CAUTION and ATTENTION notes and follow the methods described.

1-) Pull the parking brake.

2-) Shift the gear shift lever to neutral.

3-) Prepare the machine for travel. If the engine is not functional, the backhoe, the loader and the stabilizers must be lifted and secured at traveling position.

4-) The execution of these procedures depends on the condition of hydraulic circuits on the machine.

5-) Therefore, contact and consult an authorized service before attempting this.

6-) Connect the tow bar to an appropriate location.

⚠ DANGER
Block the loader arms before connecting the tow bar.

⚠ WARNING
Do not connect the external current directly through the starter engine. Doing so will deactivate the idle gear safety switch. In this case, the Machine, if in gear, may "move" backwards and cause the death or injury of people around.

The machine is now ready for towing. Make sure you understand what the towing vehicle's driver will do. Observe all instructions and directions given by this person.

Also remember that, if the engine cannot be started, it will take greater effort to turn the steering wheel.

4.12 Jump Start

⚠ DANGER
• Do not use the battery if the acid is frozen. Always keep the battery at full charge to prevent the acid from freezing. • Attempting to charge a frozen battery or to use a frozen battery as external battery to start the engine may cause the battery to explode. • Batteries emit flammable gases, which may lead to explosions. Do not smoke while checking the battery acid levels. • While starting the engine by drawing power from another machine, make sure the machines are not in contact with each other. This will eliminate the possibility of any sparks near the battery. Switch off all circuits that are not connected to the ignition key.

DANGER

- Make sure that the extension cords are in good condition and the connections are settled properly. Connect the extension cords one by one.
- Determine the positive (+) pole of the battery before connecting any element.
- Do not allow any metallic watch cords and jewelry near the extension cord connections and battery poles. The resulting short circuit may cause serious burns and damage the machine.

WARNING

The electrical system on this machine is a 12-volt negative earthed system. The current from the external battery cord must not exceed 12 volts. A current with voltage in excess of this level will damage the machine's electrical system.

If you are unsure about the voltage in the external current source, consult the authorized service. If unsure about the voltage in the external current source, do not attempt to operate the machine with external charge.

1-) The parking brake must have been engaged after parking. If it is not, pull it now.

DANGER

Make sure there are no people on and around the Machine before lowering the Attachments. People on or around the vehicle may be crushed under the attachments or trapped between the joints.

2-) Turn all switches in the cabin to off position.

3-) If in lifted position, lower the loader shovel. The shovel will automatically lower by its weight when you operate the control sticks. Operate the controls carefully to keep the lowering speed under control. You cannot lower the shovel if protective valve is attached to the machine as protection against hose explosions. In this case, attach a safety prop.

4-) Connect the positive end of the extension cord to the positive (+) pole of the Machine's battery. Connect the other end of the cord to the external battery's positive (+) pole.

⚠ DANGER
There are parts in the engine section that will be rotating parts when the engine is running. Make sure there are no loose parts of your clothes that may get stuck in these rotating parts (Example: sleeves, scarf etc.) before detaching the cords.

5-) Connect the negative (-) end of extension cord to a suitable part of the engine.

6-) To start the engine, see the Starting the Engine section

7-) Detach the extension cord's negative end from the engine. Then, detach the cord's other end at the external current source.

Detach the positive cord end from the battery's positive (+) pole, then detach it from the positive pole from the external current source.

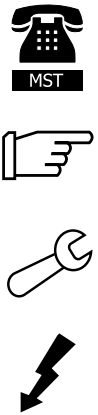
5 Maintenance Information

5.1 Maintenance

5.1.1 General Instructions

Before performing any service or maintenance on the machine, follow the shut-down procedure unless otherwise instructed. Ensure the machine is level, for proper fluid readings.

- Clean lubrication fittings before lubricating.
- After greasing the machine, cycle all functions several times to distribute lubricants.
- Perform this maintenance procedure without attachment installed.
- Apply a light coating of engine oil to all linkage pivot points.
- Intervals shown are for normal usage and conditions. Adjust intervals for abnormal usage and conditions.
- Check all lubricant levels when lubricant is cool, with the exception of the transmission fluid. For ease of filling hydraulic reservoir, use a funnel with a hose or flexible tube for best results.



WARNING - Maintenance Safety

- After service has been performed, be sure to restore all guards, shields and covers to their original positions before resuming machine operation.
- Do not perform any maintenance or repair without the owner's prior authorization. Allow only trained personnel to service the machine.
- Warranty repairs can only be carried by an authorized **MST** service.
- All maintenance & service works must be performed by trained and competent personnel who are familiar with mechanical and electrical procedures.

WARNING - Warranty Void

- Do not service or repair major components, unless authorized to do so by your **MST** dealer. Any unauthorized repair will void the warranty.

5.1.2 Health and Reliability

It is very important that you read and understand the information and references herein. Make sure this information is read by all of your colleagues working with the oils.

Cleaning

The oils used in this machine's systems do not constitute any health risks when used correctly in line with intended purposes. However, sustained skin contact with such oils will absorb the natural fats on your skin, causing skin dryness and irritation.

Oils with low viscosity are more likely to cause this. In this respect, take care when working with fuel-mixed, contaminated and used oils.

When working with petroleum products, exercise caution and keep the workplace cleanliness standards at a high level. For detailed information on these precautions, read the publications of local healthcare organizations as well as the following information.

Storage

Keep the oils out of reach of children. Do not keep the oils in open or unlabeled containers.

Disposing Residues

All residues must be disposed in accordance with the relevant regulations. Discharge and dispose used oil in accordance with the local regulations. Do not discharge used engine oil into servers, drains or the ground.

New Oils

Working with new oils does not require any special precautions in addition to the usual rules of care and hygiene.

Used Oils

Used engine crankcase oils contain harmful contaminants. Below are the precautions necessary to protect your health when contacting used engine oil:

1) Avoid prolonged, too much or repeated skin contact with the oil.
2) Apply protective cream on your hands before touching engine oil. 3)

Take care to do the following to clean the engine oil on your skin.

- Wash your skin with water and soap. Using a nail brush when washing your hands may prove helpful.
- Use special cleaning products to clean the stain on your skin.
- Do not use petrol, diesel or paraffin for cleaning your skin.

4) Avoid skin contact with oil-contaminated cloths.
5) Do not carry oily parts on you (in your pocket etc).
6) Wash contaminated cloths before reuse.
7) Wash contaminated cloths before reuse.

First Aid for Oil Contact

In case of contact, wash your eyes with water for 15 minutes. Consult a doctor if irritation continues.

Swallowing

If the oil is swallowed, do not induce vomiting. Consult your physician.

Skin

In case of too much skin contact with oil, wash your skin with water and soap.

In case of **Oil Spills;**

- Pour sand or granules with proven soaking capabilities on the oily surface and then sweep it up to dispose at chemical disposing field.

In case of **Oil Burns;**

- Use carbon dioxide, dry chemicals or foam to extinguish. The people fighting the fire should use external respiratory equipment and masks in order to prevent being exposed to the flame fumes.

5.2 Service Requirements

5.2.1 General Instructions

The vehicle is designed and manufactured to provide the highest performance, operate easily under various conditions and to be used in the most economical way. The vehicle has been checked in the factory and in distribution before delivery to assure it is in the best condition. To keep the machine in this condition and ensure its operation without any difficulty, it is important that the vehicle is maintained in regular intervals by authorized MST dealers as described in this manual.

Maintenance

This chapter of the manual provides all the details of service needs necessary to ensure your MST vehicle operates at full efficiency.

To preserve the vehicle's performance, MST service must carry out the first service and checks of your vehicle after the first month or the first 100 hours of operation, whichever is sooner. You must notify the service in advance to make the necessary arrangements.
Most of the required service checks can only be carried out by a trained MST expert, as indicated in the "Service Intervals" section in the following pages. Only trained and authorized MST Service Technicians are equipped with the special tools and control devices necessary to carry out such tasks completely, safely, accurately and adequately.

MST Services are regularly updated on the new product developments and changes in specifications and applications. Therefore, only MST Services can fully maintain and service your vehicle. Service Registration Form will help you to plan service needs and keep records of past service applications. The registration form must be signed and seal and the date indicated each time the vehicle is serviced. Remember, full maintenance of the vehicle will ensure reliability and greatly increase the machine's value, if you decide to sell it.

Service Maintenance Agreements

We strongly recommend using Service and Maintenance Agreements advised by your service to help plan the vehicle's maintenance costs and set equal intervals of maintenance. These agreements can be customized to suit your working conditions and times. Please consult your MST service for detailed information.

⚠ DANGER
The vehicle should always be lubricated after pressure washing and steam cleaning.

Support for Owner/User

With your dealer, MST provides complete service to fully appreciate your MST vehicle. If you encounter any problems, contact the MST authorized services; they are there to help you. To fully benefit from the services, help them as described below.

- Provide your name, address and phone number.
- Provide the vehicle's model and serial number
- Indicate date of delivery and hours of operation.
- Explain the problem.

Remember, only MST services have access to various resources to assist you.

5.2.2 Cleaning the Machine

After parking the vehicle at a stable surface, lower all equipment of the vehicle and stop the Engine. Pull the parking brake and shift the gear to neutral.

Clean the vehicle with water and/or steam. Prevent mud, dirt etc. accumulation on the machine and pay attention to the following:

- Backhoe hoses passing through the main chassis
- Swing cylinders
- Kingpost sliding rails
- Kingpost hose tray and lower "rack"
- Swing cylinder and kingpost casting

Stabilizer cavities may be blocked while working on soft/wet ground. Remove and clean all accumulated dirt.

Do not allow mud accumulation on the engine and the transmission. Make sure the radiator grill is not blocked.

⚠	WARNING

- Do not allow hay, grass, wood dust and similar lightly flammable materials and airborne particles to accumulate inside the engine compartment or prop shaft covers (if attached). Frequently check these spots and clean at the beginning of each shift or more frequently, if necessary.
- Make sure there is no dirt before opening the engine cover.
- Do not use pure detergent when cleaning; dilute it as specified by the manufacturer. If you use pure detergent, the vehicle paint coat may be damaged.
- Remember that washing with excessive pressure will damage the felt and bearings. Do not apply pressure water directly on the oil felt and cardan-joints while washing.
- Always observe the local rules when disposing the waste after cleaning the vehicle.

5.2.3 Damage Checks

When you check the vehicle for damages;

- Check for any damage on the steel sections of the vehicle. Check the paint job for damage, to be repaired later.
- Check that all joint pins are in place and secured with locking mechanisms.
- Check that the steps and handles are free of damage or in good condition.
- Check all shovel blades for damage and safety.
- Check all shovel blades for damage and safety.
- Check for any damage or piercing objects stuck on the tires.
- Check that all safety stickers are in place and free of damage. Place new stickers as necessary.

5.2.4 Spare Part Supply

We recommend using original MST parts only. 'Backhoe Loader Spare Parts Catalogue' will help you identify spare parts and place orders to the MST Vendor.

The vendor will need to know the vehicle's exact model, manufacturing and serial numbers. The vehicle's serial number is inscribed on the identification place on the left side of the machine.

Also, the serial numbers of the engine, transmission, axle and similar parts are indicated on the labels on the respective part.

⚠	WARNING
There are Warning Labels in certain sections of your Vehicle. Before replacing the parts, make sure the warning label is placed on the right place on the new part. See the Safety Labels topic in the INTRODUCTION chapter. If the label is missing, consult the service.	

5.3 Service Periods

Operating the vehicle without maintenance is hazardous to the operator and the people in the vicinity. To ensure the vehicle continues to operate safely and efficiently, perform the regular maintenance and lubrication indicated in service intervals.

⚠	WARNING
Maintenance should be carried out by authorized service staff of MST. Check that the vehicle is secured before starting any maintenance work. Park the vehicle on level surface. If you are required to work when the loader arms are raised, place the loader arm safety prop.	

Maintenance should be carried out by authorized service staff of MST. Check that the vehicle is secured before starting any maintenance work. Park the vehicle on level surface. If you are required to work when the loader arms are raised, place the loader arm safety prop.

Calendar Match

10 Hours : Daily
50 Hours : Weekly
250 Hours : 3 Months
500 Hours : 6 Months
1000 Hours : Yearly
2000 Hours : Every 2 years (Biennially)

5.3.1 Walk-Around Inspections

We recommend using original MST parts only. 'Backhoe Loader Spare Parts Catalogue' will help you identify spare parts and place orders to the MST Vendor.

The vendor will need to know the vehicle's exact model, manufacturing and serial numbers. The vehicle's serial number is inscribed on the identification place on the left side of the machine.

Also, the serial numbers of the engine, transmission, axle and similar parts are indicated on the labels on the respective part.

Inspect the Engine for Leaks and for Loose Connections

A walk-around inspection should only take a few minutes. When the time is taken to perform these checks, costly repairs and accidents can be avoided.

For maximum engine service life, make a thorough inspection of the engine compartment before starting the engine. Look for items such as oil leaks or coolant leaks, loose bolts, worn belts, loose connections, and trash buildup. Make repairs, as needed:

- The guards must be in the correct place. Repair damaged guards or replace missing guards.
- Wipe all caps and plugs before the engine is serviced in order to reduce the chance of system contamination

WARNING
For any type of leak (coolant, lube, or fuel) clean up the fluid. If leaking is observed, find the source and correct the leak. If leaking is suspected, check the fluid levels more often than recommended until the leak is found or fixed, or until the suspicion of a leak is proved to be unwarranted.

WARNING
Accumulated grease and/or oil on an engine is a fire hazard. Remove the accumulated grease and oil.

- Ensure that the cooling system hoses are correctly clamped and that the cooling system hoses are tight. Check for leaks. Check the condition of all pipes.
- Inspect the water pump for coolant leaks.

WARNING
The water pump seal is lubricated by the coolant in the cooling system. A small amount of leakage to occur is normal, as the engine cools down and the parts contract.

Excessive coolant leakage may indicate the need to replace the water pump. Remove the water pump.

Refer to Disassembly and Assembly, "Water Pump - Remove and Install" in the service manual.

- Inspect the lubrication system for leaks at the front crankshaft seal, the rear crankshaft seal, the oil pan, the oil filters, and the rocker cover.
- Inspect the piping for the air intake system and the elbows for cracks and for loose clamps. Ensure that hoses and tubes are not contacting other hoses, tubes, wiring harnesses.
- Ensure that the areas around the rotating parts are clear.
- Inspect the alternator belts and any accessory drive belts for cracks, breaks, or other damage.
- Inspect the wiring harness for damage.

High Pressure Fuel Lines

DANGER

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these inspection, maintenance and service instructions may cause personal injury or death.

After the engine has stopped, wait 10 minutes in order to allow the fuel pressure to be purged from the high-pressure fuel lines before any service or repair is performed. The 10 minute wait will also allow static charge to dissipate from the low-pressure fuel system. If necessary, perform minor adjustments. Repair any leaks from the low-pressure fuel system and from the cooling, lubrication, or air systems. Replace any high-pressure fuel line that has leaked. Refer to service manual , "Fuel Injection Lines - Install".

If you inspect the engine in operation, always use the proper inspection procedure in order to avoid a fluid penetration hazard.

Visually inspect the high-pressure fuel lines for damage or signs of fuel leakage. Replace any damaged high-pressure fuel lines or high-pressure fuel lines that have leaked.

Ensure that all clips on the high-pressure fuel lines are in place and that the clips are not loose.

- Inspect the rest of the fuel system for leaks. Look for loose fuel line clamps.
- Drain the water and the sediment from the fuel tank on a daily basis.
- Inspect the wiring and the wiring harnesses for loose connections and for worn wires or frayed wires. Check for any loose tie-wraps or missing tie wraps.
- Inspect the ground strap for a good connection and for good condition.
- Disconnect any battery chargers that are not protected against the current drain of the starting motor. Check the condition and the electrolyte level of the batteries, unless the engine is equipped with a maintenance free battery.
- Check the condition of the gauges. Replace any gauges that are cracked. Replace any gauge that cannot be calibrated.

Engine After-treatment

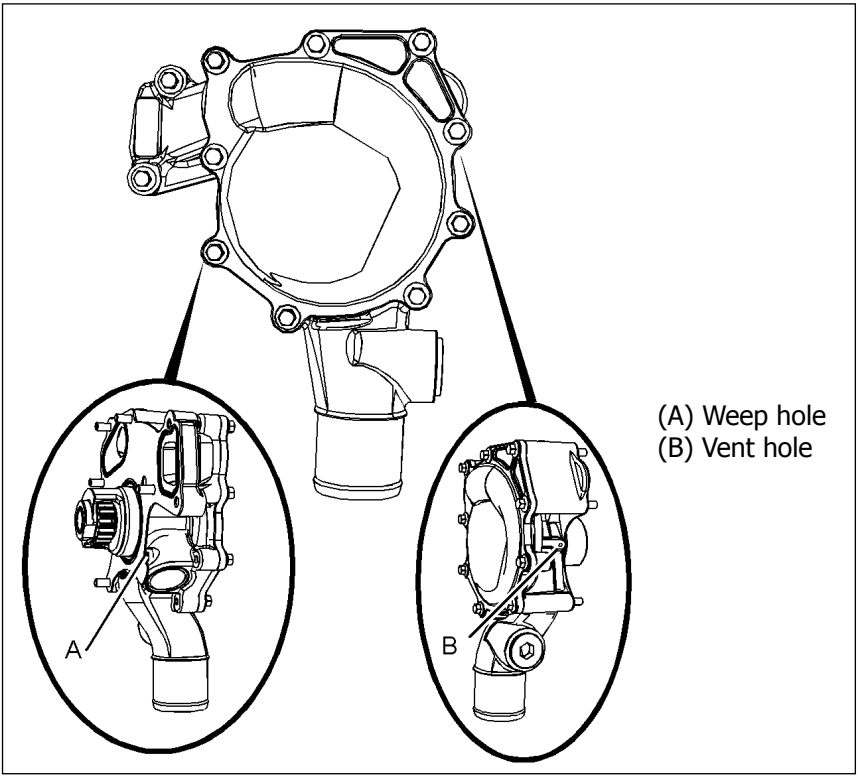
Check the condition of the coolant lines, Diesel Exhaust Fluid (DEF) lines, and electrical connections.

Check that all clamps, clips, and tie-wraps are secure and in good condition. Check that the DEF filler cap is secure and that the cap is clean and free from dirt.

Water Pump - Inspect

A failed water pump may cause severe engine overheating problems that could result in the following conditions:

- Cracks in the cylinder head
- A piston seizure
- Other potential damage to the engine



WARNING

The water pump seals are lubricated by the coolant in the cooling system. It is normal for a small amount of leakage to occur. Refer to illustration 93 for the position of the weep hole and the vent hole.

Visually inspect the water pump for leaks.

WARNING

If engine coolant enters the engine lubricating system the lubricating oil and the engine oil filter must be replaced. This will remove any contamination that is caused by the coolant and this will prevent any irregular oil samples.

The water pump is not a serviceable item. In order to install a new water pump, refer to the service manual, "Water Pump - Remove and Install".

5.4 Fuel, Oil & Other Fluid Capacities

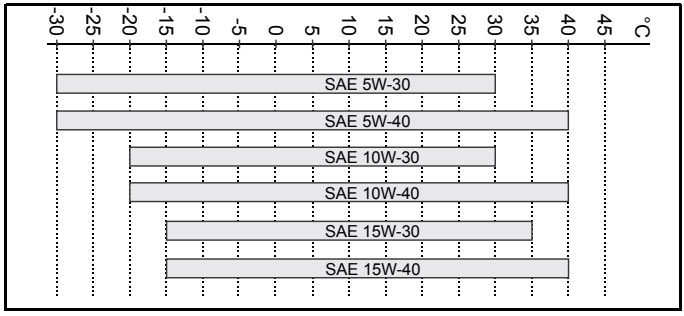
Fluid	Specification	Capacity (lt)
Fuel Tank	V-Power Diesel	140
Hydraulic System	Tellus S2 M 68 (Hot Areas)	145
Hydraulic System	S2 M 46 (Cold Areas)	145
Engine Cooling System	Shell Anti-Freeze	22
Engine Oil with Filter	Rimula R4 X 15W-40	8,5
General Grease	Gadus S2 V220	7,5
Front Axle	Spirax S2 A 80W-90	2 x 0,80
Rear Axle	Spirax S4 TXM	2 x 1,5
Transmission	Spirax S2 ATF AX 90	21

⚠ DANGER - Hydraulic Damage Risk

Intermixing different types of hydraulic oils or using oil types other than those originally supplied with this equipment can severely damage all hydraulic components. Before adding a new type of hydraulic oil, hydraulic system must be flushed fully.

5.4.1 Viscosity of Engine Oil

The viscosity is classified according to SAE. Oils suitable for multiple ranges must always be used. Depending on the ambient temperature recommend viscosity classes are shown below;



5.4.2 Engine Coolant

The cooling system must be monitored regularly. This also includes checking the coolant system corrosion protection agent concentration in addition to checking the coolant level.

The cooling system corrosion protection agent concentration can be checked with conventional test instruments (e.g. refractometer)

Cooling system corrosion protection agent	Water %	Cold protection up to
min. 35 %	65 %	-22 °C
40 %	60 %	-28 °C
45 %	55 %	-35 °C
max. 50 %	50 %	-41 °C

5.5 Maintenance Schedule

5.5.1 Equivalent Table

Maintenance and routine check periods are denoted with operating hours. Time equivalent table is shown below;

Operating Hour	Time Equivalent
10 Hours	Daily
50 Hours	10 day
250 Hours	3 Months
500 Hours	6 Months
1000 Hours	12 Months
2000 Hours	24 Months

5.5.2 COLD Checks Before Operation

Group		10 hrs	50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
ENGINE	Oil Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Oil and Filter	Ctrl	Ctrl	Ch	Ch	Ch	Ch	Ch
	Air Filter (internal and external units)	Ctrl	Ctrl	Ctrl	Ch	Ch	Ch	Ch
	Fuel Filter	Ctrl	Ctrl	Ch	Ch	Ch	Ch	Ch
	Coolant Water Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch
	Fuel Precipitant	Ctrl	E-Cln	E-Cln	E-Cln	E-Cln	Ch	E-Cln
	Fan Belt Tension/ Condition	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Tightening the Engine Conn. Nuts	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Radiator	Ctrl	Ctrl	Ctrl	Ctrl	Cln	Cln	Cln
	All Hoses - Condition	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
TRANSMISSION	Transmission Oil Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Transmission Lubricant	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch
	Transmission Filter	Ctrl	Ctrl	Ch	Ctrl	Ch	Ch	Ch
	Transmission Suction Strainer	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Cln	Cln
	Axle Oil Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Axle Final Drive Oil Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Front Axle Oil	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch
	Rear Axle Oil (Including final drives)	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch

Group		10 hrs	50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
DRIVELINE	Tire Pressure Status	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Drive	Ctrl	Ctrl	G	G	G	G	G
	Steering Wheel Axle Shaft Movement	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Stub Axles and Connections	Ctrl	Ctrl	G	G	G	G	G
	Front Axle Main Stub	G	G	G	G	G	G	G
HYDRAULIC	Fuel Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Oil	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch
	Hydraulic Return Filter	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch	Ch
	Hydraulic Suction Filter	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch
	Piston Pin Chrome Condition	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Hydraulic Oil Cooler	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl
	Hydraulic Tank Breather Filter	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch	Ch
	Hydraulic Tank breather filler strainer	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ch
BRAKES	Brake System	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Parking Brake	Ctrl	Lub	Ctrl/ Cl	Ctrl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl
ELECTRICITY	Battery Electrolyte Level (if required)	Ctrl	Lub	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Battery Post Condition and Tightness	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl

Group		10 hrs	50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
CABIN & BODY	Pins and Bearings	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl
	Door/Window Hinges	Ctrl	Ctrl	Ctrl	Ctrl	Lub	Lub	Lub
	Electrical Installation	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Telescopic Arm	Ctrl	G/A	G/A	G/A	G/A	G/A	G/A
	Clamping Cylinders	Ctrl	Ctrl	Ctrl/A	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A
	Door - Integrity and Locks	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Cabin Seat - Function	Ctrl	Lub	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Front Dashboard (544-542)	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Windshield Water Sprayer Water Level	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Attaching the Boom Lock	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Paint Condition	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	General Check of the Machine for Leakage or Damage	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl	Ctrl/ Cl

Ctrl : CONTROL
Ch : CHANGE
G : GREASE
Cln : CLEAN
E : DISCHARGE
A : ADJUST
Lub : LUBRICATE
Ctrl/Cln : CONTROL and CLEAN
Ctrl/G : CONTROL and GREASE
E/Cln : EMPTY/DISCHARGE and CLEAN
Ctrl/A : CONTROL and ADJUST
G/A : GREASE and ADJUST
Cln/Ch : CLEAN and CHANGE

5.5.2 Periodic Checks

Group		10 hrs	50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
ENGINE	Idle Speed	Ctrl	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A
	Stalling Cycle	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Maximum No-Load Speed	Ctrl	Ctrl	Ctrl/A	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A
	Exhaust Smoke (too much)	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl/A	Ctrl/A
	Air Intake System Security	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Gas system and Cable	Ctrl	Ctrl	Ctrl		Ctrl	Ctrl	Ctrl
TRANSMISSION	Driving Modes - Operation/Phasing (544)	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	2 / 4 Wheel drive function	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Lug Nut Torque	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Forward/Reverse and Gear Shift	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Steering Wheel Circuit Pressure	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Transmission Main Line Pressure	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Torque Separation Function	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Idle Starting	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Gear Clutch Pressures	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl

Group		10 hrs	50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
HYDRAULIC	MRV Pressure	Ctrl	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A
	Operation of All Services	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Locking Valve	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Unloader Pressure	Ctrl	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A
	Auxiliary Circuits & Pressures	Ctrl	Ctrl	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A	Ctrl/A
BRAKES	Foot Brake - Operation	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Parking Brake - Operation	Lub	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
ELECTRICITY	Starter engine	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Alternator – Output	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Operation of All Electrical Devices (Example: warning lights, flashers, alarms, horn, wipers, etc.)	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl
	Engine Stop Selenoid/E.S.O.S.	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl	Ctrl

Ctrl : CONTROL
Ch : CHANGE
G : GREASE
Cln : CLEAN
E : DISCHARGE
A : ADJUST
Lub : LUBRICATE

Ctrl/Cln : CONTROL and CLEAN
Ctrl/G : CONTROL and GREASE
E/Cln : DISCHARGE and CLEAN
Ctrl/A : CONTROL and ADJUST
G/A : GREASE and ADJUST
Cln/Ch : CLEAN and CHANGE

5.5.3 Consumables

Group	100 hrs	250 hrs	500 hrs	1000 hrs	2000 hrs
Engine Oil and Filter	*	*	*	*	*
Air Filter (internal and external units)		*	*	*	*
Coolant Water Level					*
Fuel Precipitant				*	
Transmission Lubricant				*	*
Transmission Filter	*		*	*	*
Front Axle Oil				*	*
Rear Axle Oil (Including final drives)				*	*
Hydraulic oil					*
Hydraulic Return Filter			*	*	*
Hydraulic Suction Filter				*	*
Hydraulic Tank Breather Filter				*	*
Hydraulic Tank breather filler strainer					*

5.6 Loader Arm and Safety Prop

5.6.1 Attaching - Unattaching

Attach the loader arm safety props before starting to work under lifted loader arms.

⚠ WARNING

Lifted loader arms may suddenly fall and cause injuries. Attach the loader arm safety props before starting to work under lifted loader arms.

- Empty the Shovel and Fully Lift the Loader Arms.
- Stop the engine.
- Remove the ignition key.

⚠ WARNING

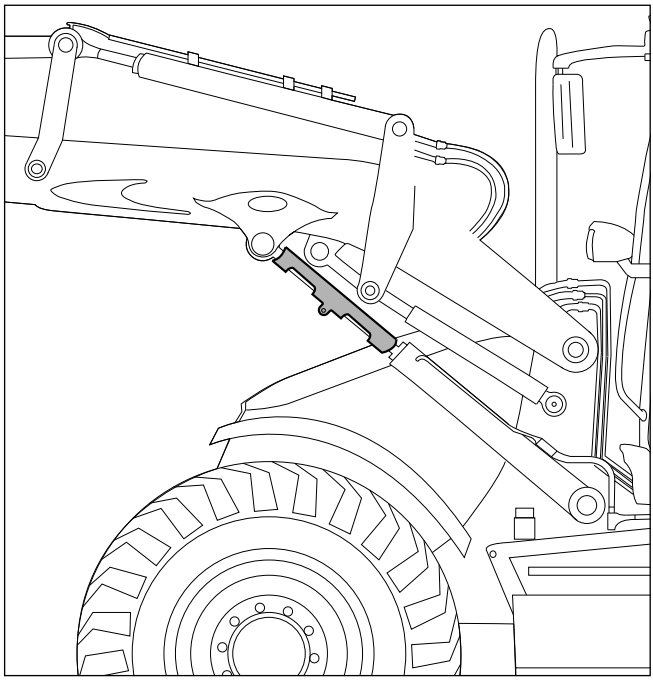
Accidentally operating the loader control may result in your death or injury. Make sure no person is and gets close to the machine while releasing the safety prop.

- Remove the Prop from its mounting position.
- Attach the Prop to the cylinder rod.
- Lower the cylinder on the prop
- You must lower the loader arms onto the safety prop as shown in the figure, to avoid the risk of loader arm shifting down and trapping your fingers.

⚠ DANGER - Hydraulic Damage Risk

Exercise caution when using the controller arm as the loader is being lowered. Use the controller arm in increments in order to slowly lower the loader.

- Fully Lift the Loader Arms to lift the weight on the safety prop.)
- Stop the engine.
- Remove the ignition key.
- Remove the Prop



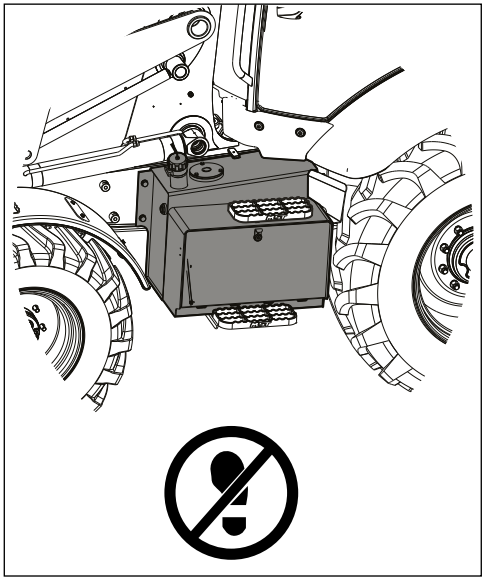
5.7 Engine Hatch

5.7.1 Opening-Closing Engine Hatch

The loader arms must be lifted and locked before opening the engine hatch. Keep the arms locked until the engine hood is closed. If you do not lock the loader arms, the shovel may fall down and cause injuries. See the Loader Arm safety Prop topic in MAINTENANCE chapter.

⚠	WARNING

- Do not open the hood while the engine is running.
- Lift the loader arms and place the safety prop. See the Loader Arms Safety Prop (MAINTENANCE Chapter).
- Stop the engine and remove the ignition key.
- Pull the A switch and pull the engine hood upwards.
- Attach and fix the engine hood in place.



For daily checks, you can reach the engine from the machine's left side using the steps shown in **C.**

Do not step on the tank during controlling. Your feet can be trapped between the lifting foot and the machine. Use the steps to avoid trapping your feet. Failure to use the steps may result in injury.

5.8 Lubrication

The vehicle must be lubricated regularly to ensure its efficient operation. Regular lubrication will also extend the machine's service life. The machine must be lubricated after each pressure washing and steam cleaning.

Lubrication must be carried out using a grease gun. Normally, it is adequate to spray twice with the gun. Stop the lubrication when the new grease appears on the seals.

The parts that must be lubricated are numbered in the figures below and in the following pages. Count them one by one during lubrication. Place the protective gaiters after lubrication.

⚠	WARNING
When greasing, carry out the task with the attachments on the ground as much as possible. Before starting any work, remove the ignition key, pull the parking brake and cut off the battery connections. This will prevent the engine from starting. Place wedges at all four wheels before working under the vehicle.	

5.9 Tires and Wheels

Instructions in this section relate to pumping air into an inflated tire. If the tire is completely deflated an expert should be handling the case

⚠ DANGER - Hydraulic Damage Risk

A slashed tire may lead to life loss. Inflatable tires may be torn when overheated. Do not cut or weld on the rims. Have all repair work carried out by an expert on tires/wheels.

1-) Prepare the Tire

Make sure the tire is correctly attached to the machine or placed into an inflating truss before inflating.

2-) Prepare the Equipment

You must use an air pump system with pressure regulator. Adjust the regulator pressure to no more than 2.38 bars, which is the recommended pressure for tires.

Use an air hose with automatically interlocking connection and remote controlled shut-off.

3-) Air Pressure

Make sure the air hose is correctly connected to the tire's valve. Clear away any persons in the vicinity. As you pressurize the wheel, stand behind the tire base and inflate the tire at the recommended pressure.

Torque Control of the Wheel Nuts

⚠ DANGER

For new machines and after removing a wheel, check the torque of wheel nuts; check every two hours until it is accurate. Check the tightness of wheel nuts every day before starting work.

The correct torque settings are as specified:

	MST-544 S	MST-542 S
Front (Nm)	550	290
Rear (Nm)	550	550

⚠ DANGER

If you are going to change one of the wheel studs for any reason, you must change the whole set of studs, as the other studs may also be damaged.

5.10 Engine Air Cleaner

If the air filter warning light on the indicator panel illuminate or mostly every 250 hours, the internal and external filtering units has to be replaced.

For replacing process;

1-) Stop the engine.

2-) Open the engine hood.

3-) When replacing the inner parts, cover the edge of the hose to prevent foreign substance to go through.

4-) Pull the yellow clip and turn the cover counter clockwise to remove it. After that remove the external filter.

5-) Clean inside the housing with wet cloth, do not allow dust into the system. Remove the dust on the valve .

6-) Remove the internal unit .

7-) Replace with the new unit.

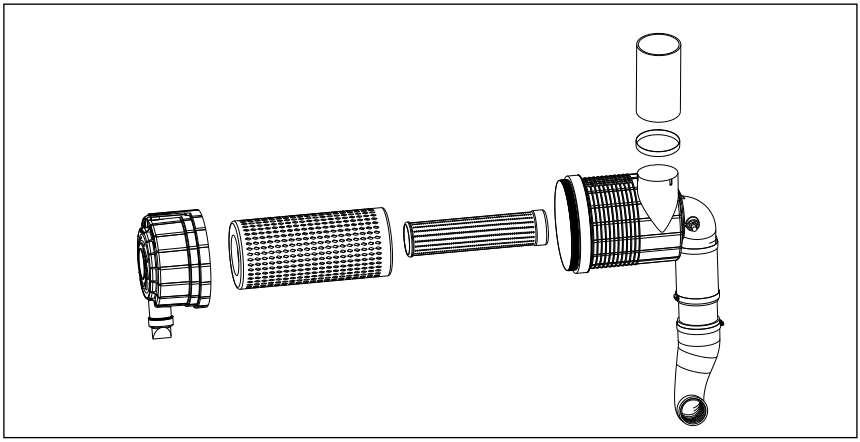
8-) Replace with a new external unit and close the cover

9-) Reattach the reduction hose . Make sure the indicator sensor is reattached.

10-) Ensure that the unit is facing downwards.

DANGER

If required to be operated at extremely dusty environments, decrease the filter replacement frequency to 100 hours. If required contact an MST authorized service for recommendations.

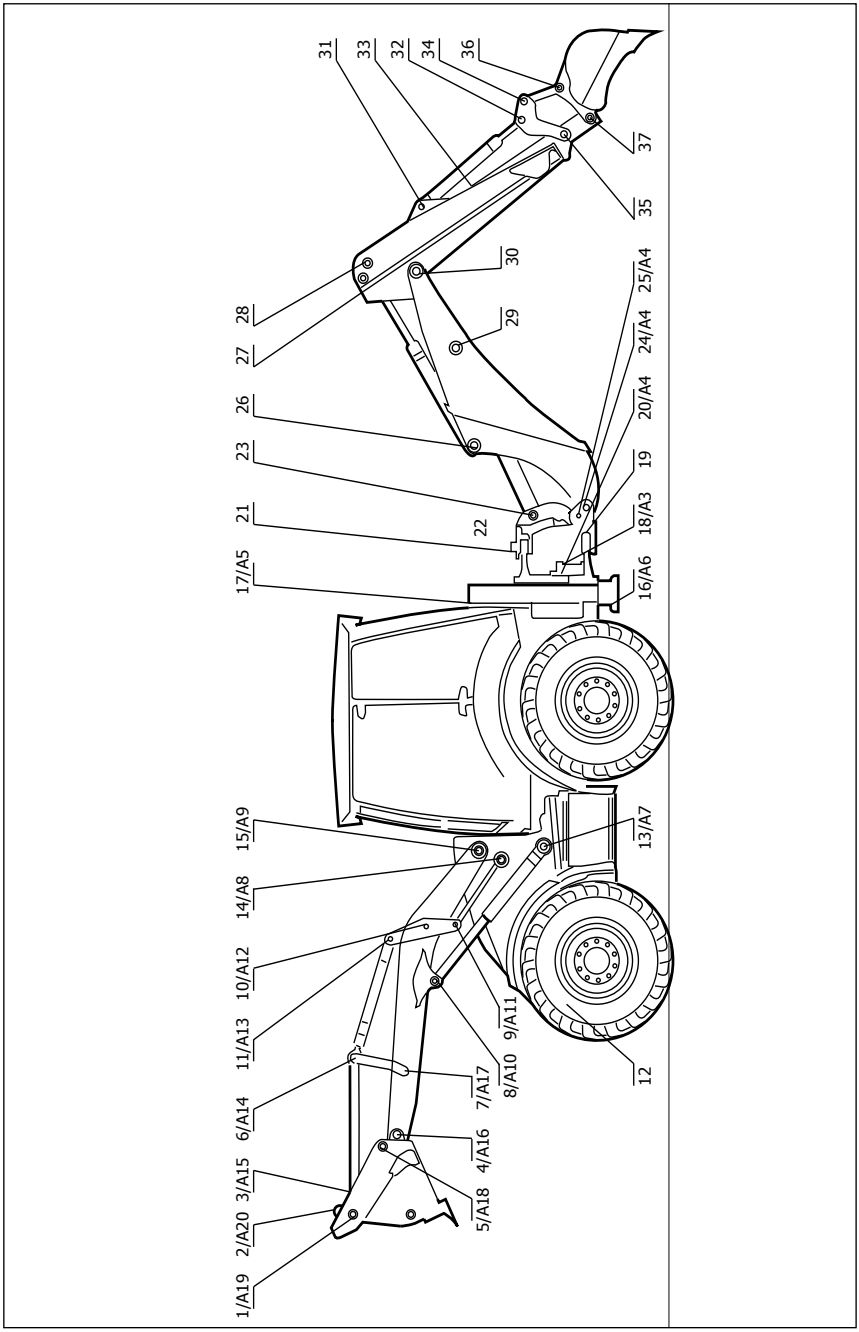


5.11 Greasing Points

	GREASING POINT
1	CLAM SHOVEL HINGE CONNECTION PIN
2	CLAM SHOVEL-CYLINDER ROD PIN
3	LEVER 1 -CLAM SHOVEL CONNECTION PIN
4	CLAM SHOVEL CONNECTION PIN
5	CLAM SHOVEL-CYLINDER BOTTOM PIN
6	TILTING CYLINDER ROD PIN
7	LEVER 2-LOADER ARM CONNECTION PIN
8	LIFTING CYLINDER ROD CONNECTION PIN
9	LEVER 3-LEVER 4 CONNECTION PIN
10	LEVER 3 LOADER ARM CONNECTION PIN
11	LEVER 3 LOADER ARM CONNECTION PIN
12	FRONT AXLE CONNECTION PIN
13	LIFTING CYLINDER CONNECTION PIN

	GREASING POINT
14	LEVER 4 CHASSIS CONNECTION PIN
15	LOADER ARM CONNECTION PIN
16	STABILIZER CYLINDER ROD CONNECTION PIN
17	STABILIZER CYLINDER CONNECTION PIN
18	KINGPOST 1- SWING CYL BRACKET
19	KINGPOST 1-2 LOWER CONNECTION PIN
20	CLAMPING CYLINDER LUBRICATOR
21	KINGPOST 1-2 UPPER CONNECTION PIN
22	BOOM LOCKING MECHANISM
23	KINGPOST 2-BOOM CYLINDER CONNECTION PIN
24	SWING CYLINDER KINGPOST 2 CONNECTION PIN
25	KINGPOST 2-BOOM CONNECTION PIN
26	ARM CYLINDER CONNECTION PIN
27	ARM CYLINDER ROD CONNECTION PIN
28	TLS CYLINDER CONNECTION PIN
29	BOOM CYLINDER ROD CONNECTION PIN
30	BOOM-ARM CONNECTION PIN
31	BUCKET CYLINDER CONNECTION PIN
32	BUCKET CYLINDER ROD CONNECTION PIN
33	TLS CYLINDER ROD CONNECTION PIN
34	LEVER 5 LEVER 6 CONNECTION PIN
35	LEVER 5 ARM CONNECTION PIN
36	BUCKET LEVER 6 CONNECTION PIN
37	BUCKET ARM CONNECTION PIN

SYMMETRIC GREASING POINT	
A1	KINGPOST 2 BOOM CONNECTION PIN
A2	SWING CYLINDER ROD-KINGPOST 2 CONNECTION PIN
A3	KINGPOST 1 GOGGLES LUBRICATOR
A4	SWING 1 CYLINDER LUBRICATOR
A5	STABILIZER CYLINDER CONNECTION PIN
A6	STABILIZER CYLINDER ROD CONNECTION PIN
A7	LIFTING CYLINDER CONNECTION PIN
A8	LEVER 4 CHASSIS CONNECTION PIN
A9	LOADER ARM CONNECTION PIN
A10	LIFTING CYLINDER ROD CONNECTION PIN
A11	LEVER 3 LEVER 4 CONNECTION PIN
A12	LEVER 3 LOADER ARM CONNECTION PIN
A13	TILTING CYLINDER CONNECTION PIN
A14	TILTING CYLINDER ROD CONNECTION PIN
A15	LEVER 1 CLAM SHOVEL CONNECTION PIN
A16	CLAM SHOVEL CONNECTION PIN
A17	LEVER 2 LOADER ARM CONNECTION PIN
A18	CLAM SHOVEL PIPE CONNECTION PIN
A19	CLAM SHOVEL HINGE CONNECTION PIN
A20	CLAM SHOVEL CYLINDER ROD CONNECTION PIN


1/A19
2/A20
3/A15
6/A14
11/A13
10/A12
14/A8
15/A9
5/A18
4/A16
7/A17
8/A10
9/A11
12
13/A7
16/A6
17/A5
21
23
26
28
27
22
18/A3
19
20/A4
24/A4
25/A4
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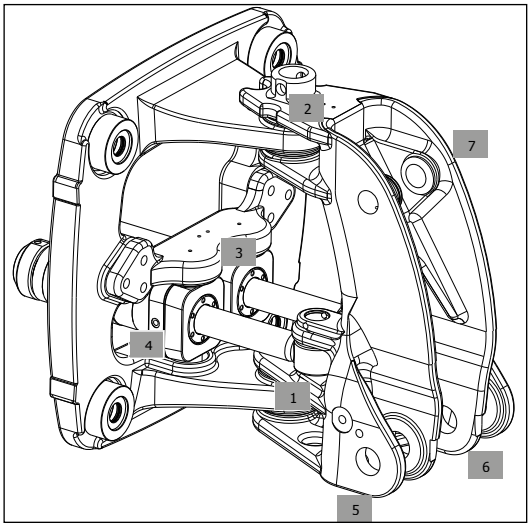
35

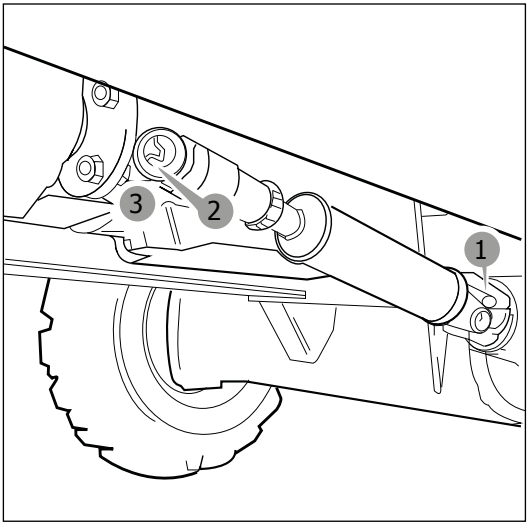
Kingpost

There are **7** points in total on the kingpost to be lubricated.



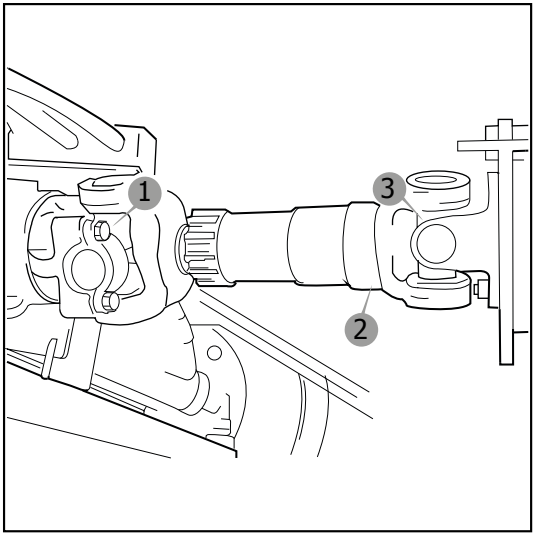
Front Shafts

There are **3** points in total to be lubricated.



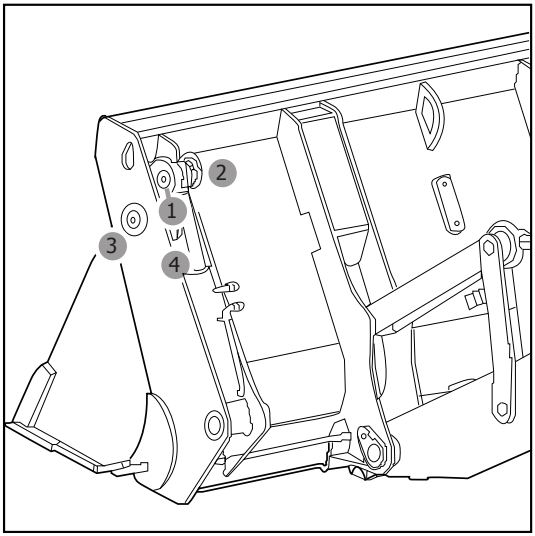
Rear Shafts

There are **3** points in total to be lubricated.

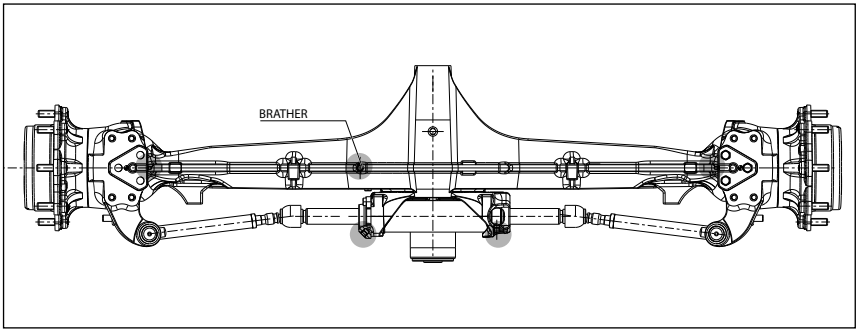


Clam Shovel

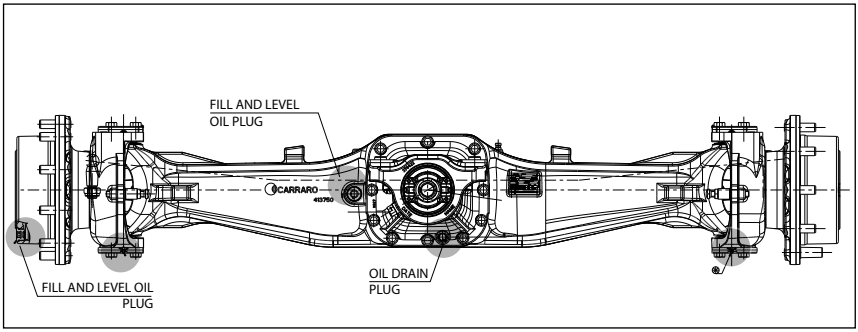
There are **6** points in total to be lubricated.



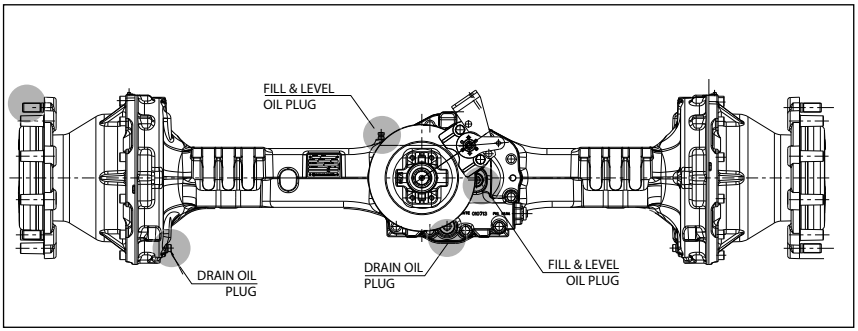
Front Axle / 2WS



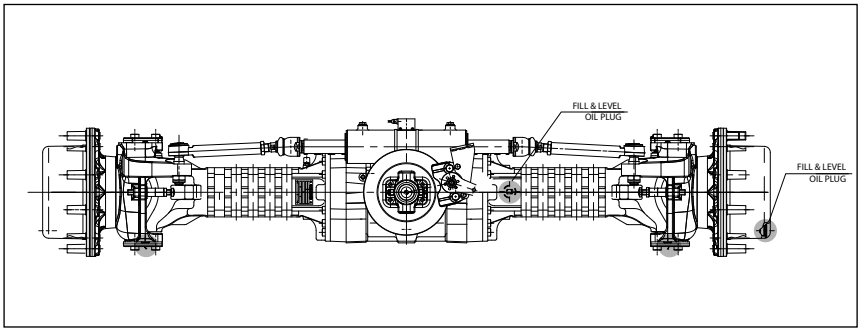
Front Axle / 4WS



Rear Axle / 2WS



Rear Axle / 4WS



5.12 Engine Oil and Filter

5.12.1 Oil Level Check

1-) Park the vehicle in solid ground, pull the parking brake and shift the gear to neutral. Raise and block the loader arm. Lower the loader arm and the backhoe. Stop the engine in OFF position and remove the ignition key.

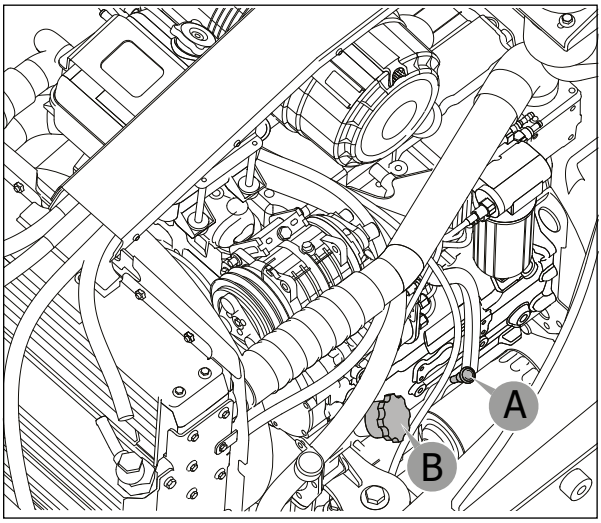
2-) Open the hood and check whether the oil level is between two marked sections at the dipstick.

3-) In case of need fill the oil through cap B. Ensure that the cap is firmly placed

5.12.2 Replacing Oil and Filter

1-) Park the vehicle in solid ground and make sure the parking brake is engaged and the gear is at neutral.

2-) Open the engine hood.



Empty the oil when the engine is warm, as the smeared substances in the suspension will discharge together with the oil.

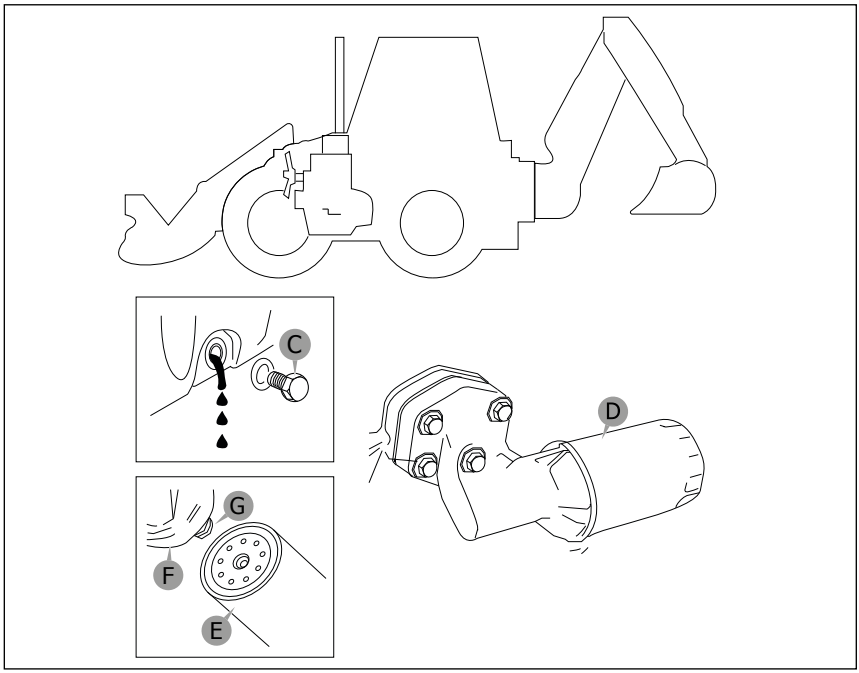
⚠ WARNING
Make sure it is safe before working under the machine. Lower the attachments , pull the parking brake, shut off the engine.

3-) Remove the front shutter. Remove the safety prop, lower the loader arm and backhoe, switch the engine to **OFF** position and remove the ignition key. Detach battery connections.

4-) Discharge the oil.

⚠ WARNING
The oil will spray out when the discharge cover is removed. Hot oil and engine parts may cause burns. Step aside after removing the cover.

- Place a container of suitable size under the discharge plug.
- Remove the O-ring using the drain plug shown as **C** and drain the oil. Clean the draining plug and insert it in place with a new O-ring, tighten with 34 Nm torque.



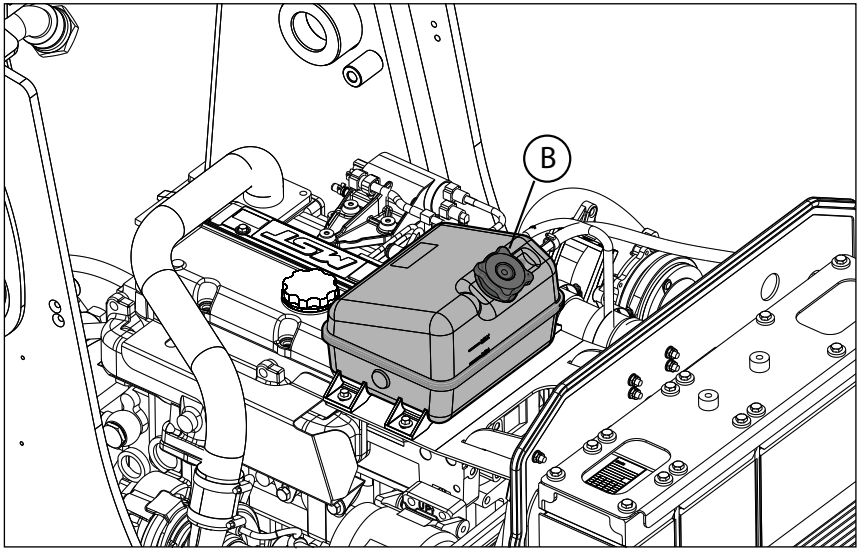
5-) Replace the filter.

- Turn and remove the filter container **D**, please notice that it will be filled with oil.
- Check that the adapter **G** is in place and good condition.
- Clean the filter head **F**.
- Add clean engine oil into the new filter container. Wait for a certain period of time to filter the oil through the filtering unit.
- Smear the surface **E** on the new filter with oil and replace the new filter container. Washing your hands will be enough.

5.13 Engine Cooling System

5.13.1 Coolant Level Check

- Park the machine on solid ground. Pull the parking brake **B** and switch the gear to neutral. Lower the loader arms and the backhoe, stop the engine and remove the ignition key.
- Open the hood.
- The coolant level must be between the **COLD/MIN** and **HOT/MAX** signs on the coolant container, shown as B. Refill with pre-mixed water/antifreeze mixture as necessary



5.13.2 Replacement of Coolant

1-) Park the machine on solid ground. Pull the parking brake and shift the gear to neutral. Lower the loader arms and the backhoe, stop the engine and remove the ignition key.

2-) Open the hood.

3-) Carefully loosen the cap **B**. Ensure that the pressure is relieved. Remove the cover.

4-) Discharge the coolant from tap **D** and put it back in its place. Make sure it is secured.

5-) Mix soft water with antifreeze and use as necessary. See the topic Coolant Mixtures (**MAINTENANCE** chapter). Fill up to the **COLD/ MIN** level shown as **B** on the coolant container.

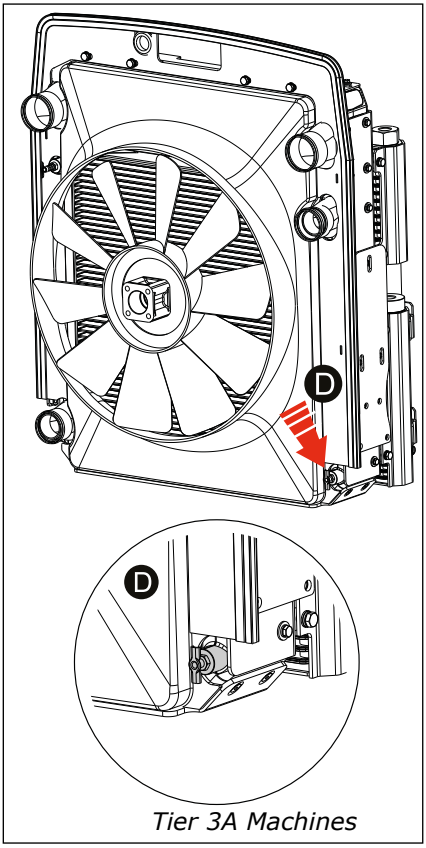
⚠	WARNING
Make sure the cabin heater control is set to heat. This will ensure the coolant is circulated in the entire system.	

⚠ WARNING
Keep your face away from the drain hole while removing the drain plug.

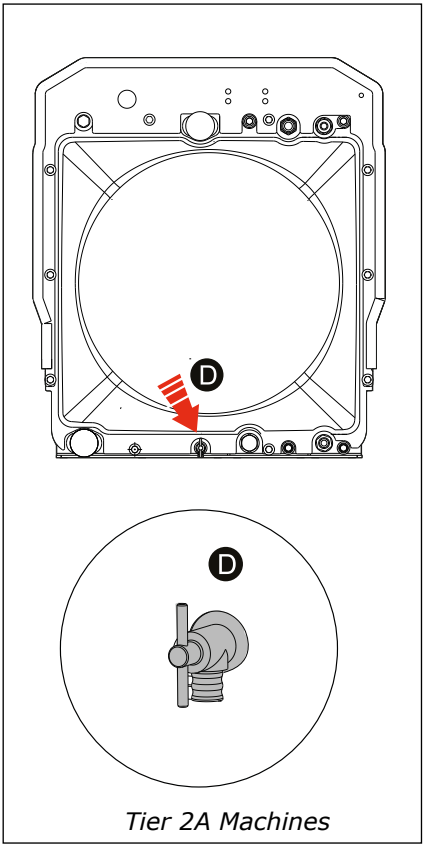
6-) Start the engine and keep at idle to circulate the coolant. Add coolant as necessary.

7-) Place the tank cap again and tighten it.

8-) Stop the engine to reduce the coolant to operating temperature and pressure. Check for leakage.



Tier 3A Machines



Tier 2A Machines

5.13.3 Fan Belt Adjustment

1-) Park the vehicle in solid ground, pull the parking brake and shift the gear to neutral. Raise and support the loader arms. Lower the rear backhoe the ground and stop the engine.

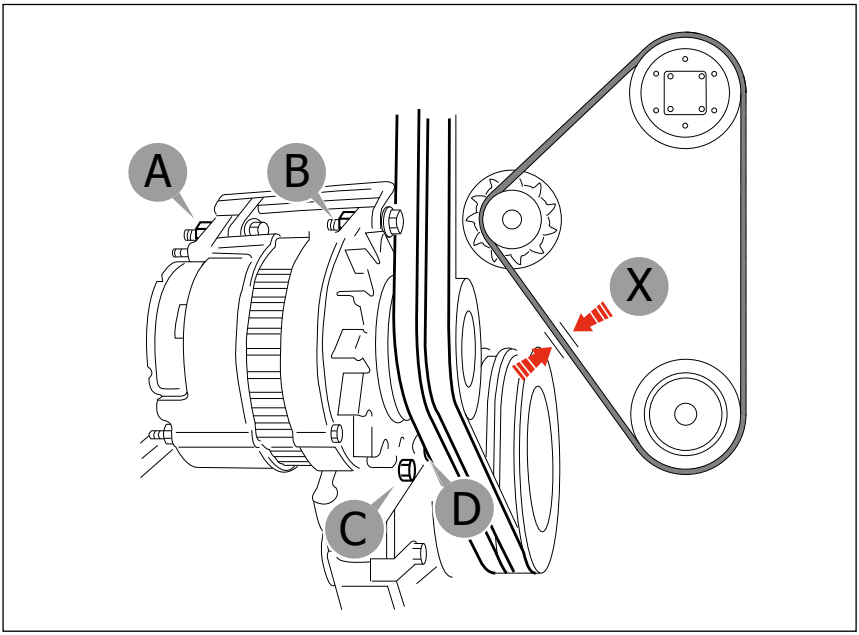
2-) Loosen the joint fixing screws **A** and **B**. Loosen the adjustment connection fixing screws **C** and **D**.

3-) The alternator must be positioned with 10 millimeters of stretching tolerance on the **X** point.

4-) Tighten the screws **C** and **D**. Then tighten the screws **A** and **B**.

Note: If a new belt is installed, the belt tension must be re-checked after 20 hours of operation.

⚠ WARNING
Make sure the engine will not start. Detach the battery connections before performing this procedure



5.14 Fuel System

Fuel Types

To achieve true power and performance from the engine, use quality diesel fuel. Below are the fuel specifications recommended for engines.

Cetane Ratio: 52-54
Viscosity : 2,3/3,5 centistokes at 40°C
Density : 0.833-0.837 kg/liter
Sulphur : 0,03 % of mass (maximum)
Refinement : 85% at 350°C

Cetane Ratio (Number)

Indicates ignition performance. Using fuel with low cetane ratio may cause problems running the engine and prevent ignition in cold weather.

Viscosity

Indicates viscosity level. It may reduce engine performance, if not within the recommended levels.

Density

Low density reduces engine power. High density increases engine power as well as exhaust smoke.

Sulphur

High rate of sulphur in the fuel may cause corrosion on the engine. If you have to use fuel with high sulphur rate, also use high alkali engine oil or renew the normal oil more frequently.

If you have to use fuel with low sulphur content, it is recommended to use a lubrication additive that the gas station recommends.

This indicates the mixture of different hydrocarbons in the fuel. High rate of light hydrocarbons may affect the ignition characteristics.

Fuel Standards

If you are unsure about the conformance of your fuel, consult your fuel provider or the MST service.

Fuels to be Used at Cold Weather

You may find special winter fuels intended for use in temperatures below zero. These fuels have lower viscosity. These fuels also limit waxing in the fuel in cold weather. (fuel waxing may block fuel flow though the filter).

Additives to increase viscosity are also available. They can be added into the fuel to reduce waxing.

⚠ WARNING
Do not use this machine with gasoline. Do not mix diesel oil and gasoline. Gasoline will surface and create vapor on the can.

⚠ WARNING
If you have to use non-standard fuels, consult the MST service for information on engine modification and replacement periods.

⚠ WARNING
Diesel fuel is flammable. Keep fire away from the machine. Do not smoke while working or refueling the machine. Do not refuel while engine is running. Failure to observe these precautions may result in fire or injuries.

Filling the Fuel Tank

⚠ WARNING
Lower the arms and turn the engine off before refueling. Do not allow any persons to touch the machine's controls while refueling.

Fill the tank with the correct fuel at the end of each shift. This will prevent water condensation within the fuel during the night.

Always keep the fuel tank cover locked.

Closing the Cover

The key and the cover will rotate around the tank's neck. To remove the cover from the tank's neck, reinsert the key and unlock the cover.

⚠ DANGER
The key MUST be inserted into the cover slot to remove and attach the cover.

Draining the Filter

1-) Park the vehicle in solid ground, pull the parking brake and shift the gear to neutral. Lift the loader arms and place the safety prop. Lower the back backhoe to the ground and stop the engine by switching to the OFF mode and remove the ignition key.

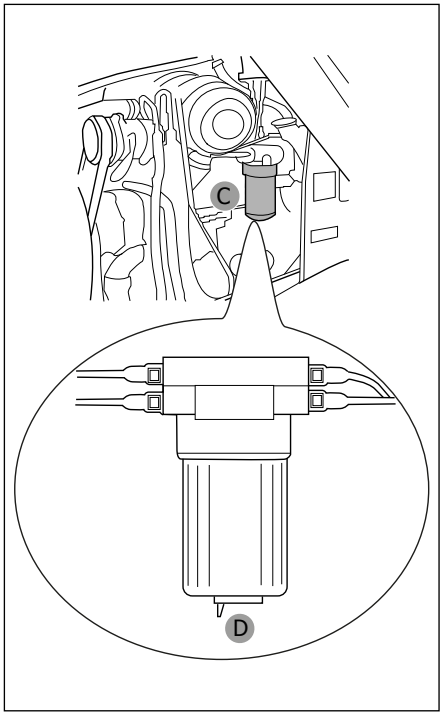
2-) Open the hood.

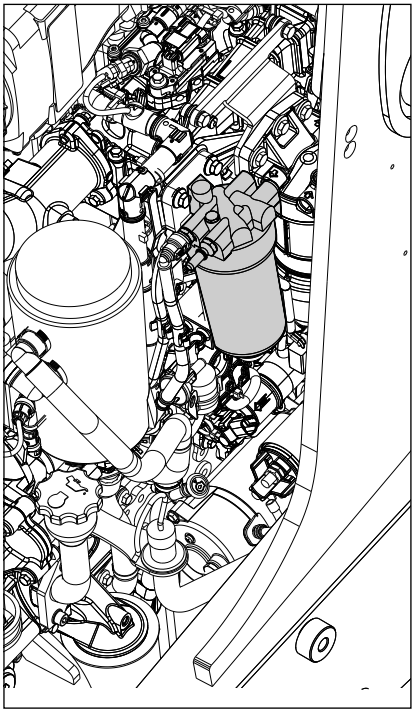
3-) Turn the tap D to drain the water in the filter container C.

4-) Make sure the tap D is closed and properly settled. Close the hood.

5-) Discharge the system.

6-) Remove the safety prop and lower the loader arm.





Replacing Filter Component

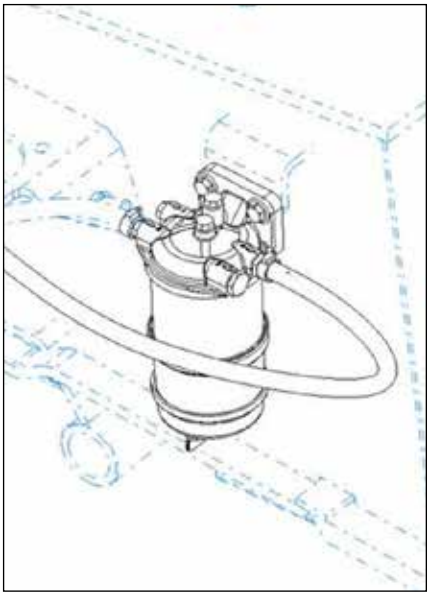
1-) Park the vehicle in solid ground, pull the parking brake and shift the gear to neutral. Lift the loader arms and place the safety prop. Lower the rear backhoe the ground and stop the engine.

⚠ WARNING

The fuel system includes the electric pump fed from the machine's ignition circuit. Always make sure the engine is in OFF position before working on the fuel system. Failure to observe this precaution may result in fire or personal injuries.

⚠ DANGER

The thread that fixes the filter unit and container in the socket is chipped into the unit material. Tightening too much may damage the thread.



2-) Open the engine hood.

3-) Hold the filter container **A** and remove the filter

4-) To remove the unit from the container, push the unit down and turn counter clockwise by one quarter. You can now lift and remove the unit from the container.

5-) Wash the container with clean fuel.

6-) Replace the cap **C** sealing ring. (Each time insert a new filter to the container. Turn the component until you feel that it is slotted in its place. (filter is fully slotted, it will do a smooth turning movement, then it will be impossible to turn the filter).

7-) Push the filter down, then turn it **C** as **D** a quarter turn clockwise. (The filter is now properly settled into the container.

8-) Slightly moisten the filter container gasket **C**. Re- screw the filter container into the socket. Only tighten the filter container manually.

9-) Discharge the system.

Draining Fuel - Water Separator

1-) Park the vehicle in solid ground, pull the parking brake and shift the gear to neutral. After raising the loader arm and placing the safety props, lower the rear backhoe on the ground and stop the engine.

> ⚠ WARNING
>
> The fuel system includes the electric pump fed from the machine's ignition circuit. Always make sure the engine is in off position before working on the fuel system. Failure to observe this precaution may result in fire or personal injuries.

2-) Look into the container **A** behind the fuel tank. If you see residue in the container, follow the instruction 4 to 6. If there is no residue, but there is water, open the plug **B** to drain the water. Make sure the plug, shown as **B**, is closed and secured.

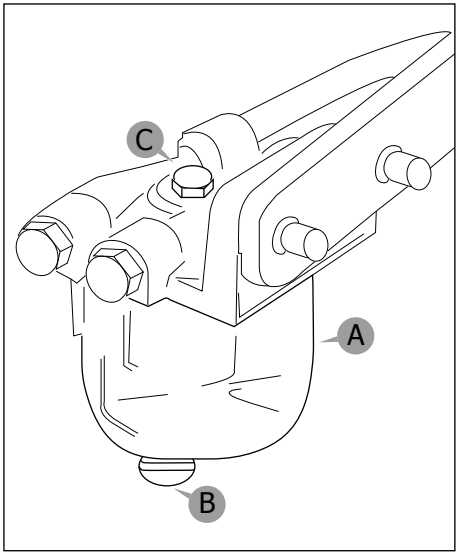
3-) Hold the container **A** and remove the nut **C** and **B** Take it out.

4-) Wash the container.

5-) Place the clean container Make sure the gaskets are settled in.

6-) Remove the air from the system.

7-) Use clean fuel.



5.15 Automatic Transmission

Check Transmission Oil Level

1-) After ensuring that the parking brake is engaged and the gear is at neutral, lower the loader arms and the backhoe on the ground. Stop the engine and remove the ignition key.

2-) Open the hood.

3-) Fill the transmission oil up to the indicator rod/tank maximum mark.

4-) Use the engine for 5 minutes to let the oil be processed slowly. This will allow the filter, pump, torque converters, oil coolant and hoses to be filled with oil.

5-) Stop the engine, remove the ignition key and wait 30 seconds. Check the fuel level and fill up to the bar level as necessary.

Oil Level Check

1-) Transmission oil must be discharged through the suction strainer space instead of the discharge cover. This will clear away all particles on the strainer when the filter is removed.

2-) Park the vehicle in level ground, pull the parking brake and shift the gear to neutral. Stop the engine and after removing the ignition key, cut off the battery connections.

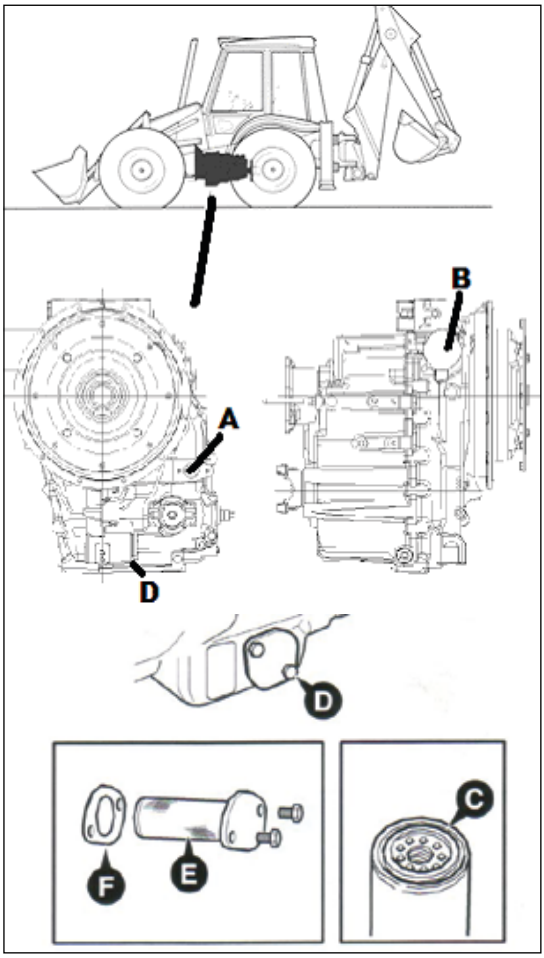
⚠ WARNING
Ensure safety before working under the vehicle. Lower the attachments, pull the parking brake, take the ignition key out and detach the battery cable.

⚠ WARNING
Use original MST filters only, otherwise, the system can be damaged due to contamination.

3-) Open the engine hood.

4-) Place a container of suitable size under the absorber filter and remove the bolts D. Remove the strainer E and gasket F. Wait for the oil to be discharged into the container. Remember, the oil may be hot.

5-) Clean the strainer with an appropriate solvent. Follow the safety instructions given by the solvent's manufacturer.



6-) Place the strainer E and a new gasket F. Place the liquid gasket on the D bolts and apply before tightening. Tighten the bolts with 10 Nm torque.

7-) Remove the filter B and place the new filter:

8-) Smear the surface C with transmission oil.

9-) Install the filter to barely touch the filter head.

10-) Turn the filter in by ¾ of a circle.

11-) Fill in new oil into the system from the oil level bar/filling pipe A. Do not exceed the top click on the oil bar.

5.16 Hydraulic System

Oil Level Check

Thin hydraulic oil sprayed by high pressure may infiltrate your skin. Do not check hydraulic oil leakages with your fingers. Do not bring your face close to the parts on which you suspect leakage.

Check the leakages by bringing a piece of paperboard close to the suspected part to see whether there is a trace of oil or not. If the hydraulic oil perforates your skin, provide medical aid immediately.

1-) Park the machine on level ground. Lower the loader shovel to the ground. If mounted, retract the Telescopic arm. Lift the boom, retract the dipper arm and close the shovel. Stop the engine. Remove the ignition key.

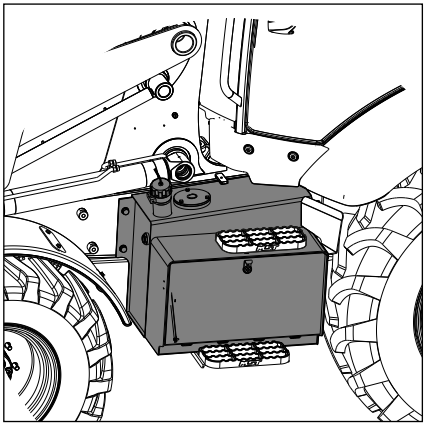
2-) Check liquid level on the oil level indicator **A**. The level must be above the mid-point of the indicator.

3-) If the oil level is low, remove the fill cap, shown as **B**, and fill with hydraulic oil as much as recommended.

Hydraulic Oil Level Indicator

Hydraulic oil level indicator is on the oil tank.

⚠ WARNING
Normally, the oil level is indicated on the indicator. If the hydraulic pistons are oiled, the indicator may not show oil.



The hydraulic system contains oil cooler. This oil cooler keep the oil temperature between 55-65 °C. Hydraulic oil is automatically cooled by a engine fan.

Replacing Hydraulic Return Filter

⚠ WARNING
Thin hydraulic oil sprayed by high pressure may infiltrate your skin. Do not check hydraulic oil leakages with your fingers. Do not bring your face close to the parts on which you suspect leakage. Check the leakages by bringing a piece of paperboard close to the suspected part to see whether there is a trace of oil or not. If the hydraulic oil perforates your skin, provide medical aid immediately.

1-) Park the machine on level ground. Tip the loader shovel forward and rest it on the ground. If attached, retract the telescopic arm. Close the backhoe shovel and remove the arm. Lower the boom down until the shovel is resting on the ground. Lower the feet to the ground. Stop the engine and remove the ignition key.

2-) Remove the equipment.

- Remove the screws shown as **A**. Remove the banjo bolt shown and bracket, shown as **D** and **E**, remove the **F** cover plate at the last step.
- Remove the spring.
- Remove the filter from its socket and dispose of the old one.

3-) Remove the filter item **G** from the container

4-) Place the new item.

- Push the element into slot **G**.
- Fix the spring and the new cover o-ring.
- Tighten the cover plate **F** and screws **A** to **21 Nm**.
- Check the oil level, filter and fill oil when required.

Replacing Hydraulic Suction Filter

⚠ WARNING
Make sure the vehicle is safe before working under it. Lower the attachments , pull the parking brake, take the ignition key out and detach the battery.

1-) Park the machine on level ground. Tip the loader shovel forward and rest it on the ground. If attached, retract the telescopic arm. Close the backhoe shovel and remove the arm. Lower the boom down until the shovel is resting on the ground. Lower the feet to the ground. Stop the engine and remove the ignition key.

2-) Remove the hydraulic tank cap.

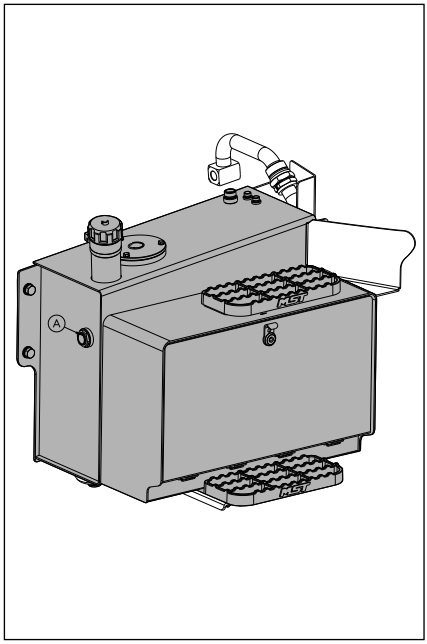
3-) Place a container under the hydraulic reservoir to hold the oil. Remove the drain plug shown as **B** under the tank and drain the hydraulic oil. The container used should be large enough to contain the contents of the tank.

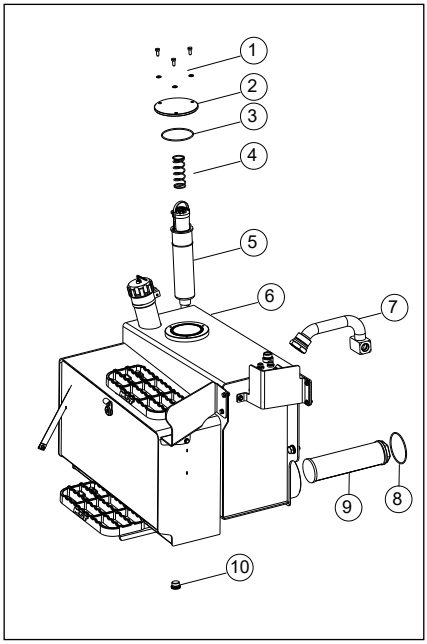
4-) Remove the equipment.

- Remove the screws shown as **H**, remove and dispose of the suction filter **C**.
- Insert a new suction filter **C**, tighten the screws to **21 Nm**.

5-) Insert the drain cap and tighten with **10 Nm** torque.

6-) Refill the hydraulic tank and then place and tighten the filling cap.





5.17 Front and Rear Axle

Differential Oil Level Check

⚠ WARNING
Make sure the machine is safe before working under it. Lower the attachments , pull the parking brake, take the ignition key out and detach the battery connections.

⚠ WARNING
Axle oil level must be checked on level surface at all times. Otherwise, the axle oil level measurement will be inaccurate.

1-) Park the machine on solid ground. Pull the parking brake. Set the gear to neutral. Lower the attachments. Switch off the engine and remove the ignition key!

2-) Clean the surrounding of fill/level plug A, then remove the plug and the sealing washer. The oil must be at the level at the bottom of the hole. Fill in the recommended oil as necessary.

3-) Clean and reinstall the plug and the washer.

Differential Oil Replacement

⚠ WARNING
Make sure the machine is safe before working under it. Lower the attachments , pull the parking brake, take the ignition key out and detach the battery connections.

1-) Park the machine on solid ground. Pull the parking brake. Set the gear to neutral. Lower the attachments. Switch off the engine and remove the ignition key!

2-) Place a container of suitable size to hold the oil under the plug shown as B. Remove the plug B and the washer. Drain the oil Drain pipe is magnetic. Wipe to clean. (Carefully clean metallic parts). Install the drain plug and gasket shown as **B**. Tighten with **60 Nm** torque.

3-) Fill with the recommended oil from the filling/level hole shown with A. Clean and reinstall the plug and gasket shown as **B**. Tighten with 60 Nm torque.

Hub Oil Level Check

Check each hub individually..

1-) Park the machine on solid ground when the **OIL LEVEL** indicator is horizontal. **5 mm** below or over the horizontal plane is tolerated.

2-) Pull the parking brake and shift the gear to neutral. Lower the attachments, stop the engine and remove the ignition key.

3-) Clean the surroundings of the **C** fill/level plug Remove the plug. It should be at the same level of the underside of the oil hole Add the recommended oil as necessary. Clean the plug before reinstalling.

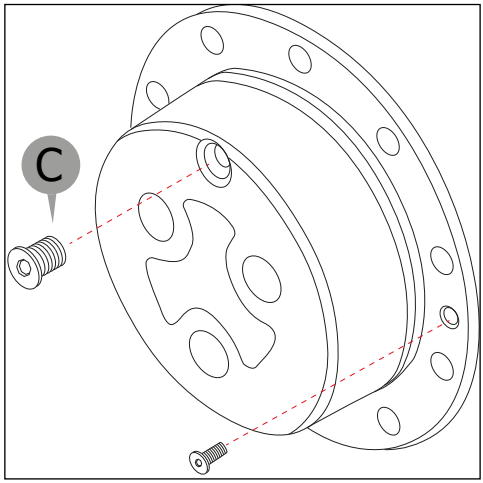
Hub Oil Replacement

Axle oil is used to lubricate brake components and to cool down the brake linings.

It is important to renew the oil as defined in the service schedule. As the braking system is worn, the oil efficiency will be reduced.

Consult an MST service as necessary. Change the oil in each hub individually.

1-) Position the machine on level ground to keep the tires right above the ground. Turn the wheels manually until the **OIL LEVEL** sign on the hub is vertical. **C** fill/level plugs must be at the bottom.



2-) Place a suitable container under the plug **C** to hold the oil.

- Remove the **C** fill/level plugs. Allow some time for the oil to spill.

3-) Move the **OIL LEVEL** signs to horizontal position. **5 mm** below or over the horizontal plane is tolerated.

- Fill the plugs with recommended axle oil through **C** fill/level holes. The oil should be at the same level as filling/level hole.

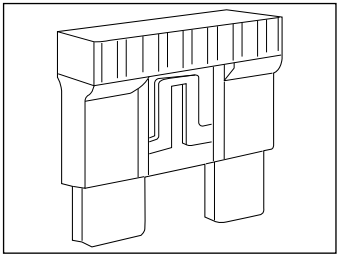
5.18 Electrical System

Fuses

The fuses are located on the side console. If any of the fuses are blown, identify the cause and remedy the malfunction before replacing the fuse.

⚠ WARNING
In order to prevent damaging the electrical system the blown fuses should always be replaced with fuses with correct amp value.

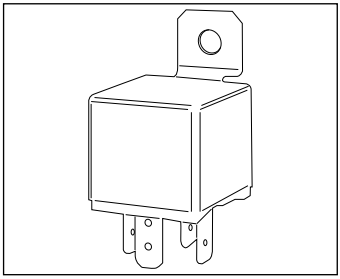
The fuse panel layout is shown below. Always replace blown fuses with replacements of correct ampere to avoid damaging the electrical system.

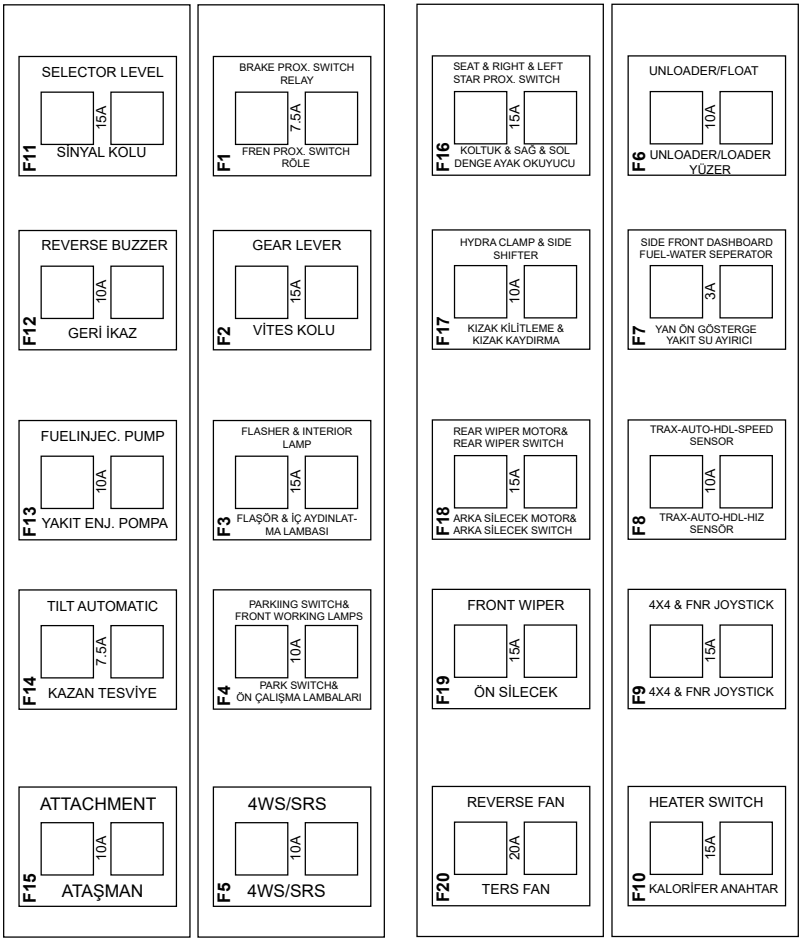


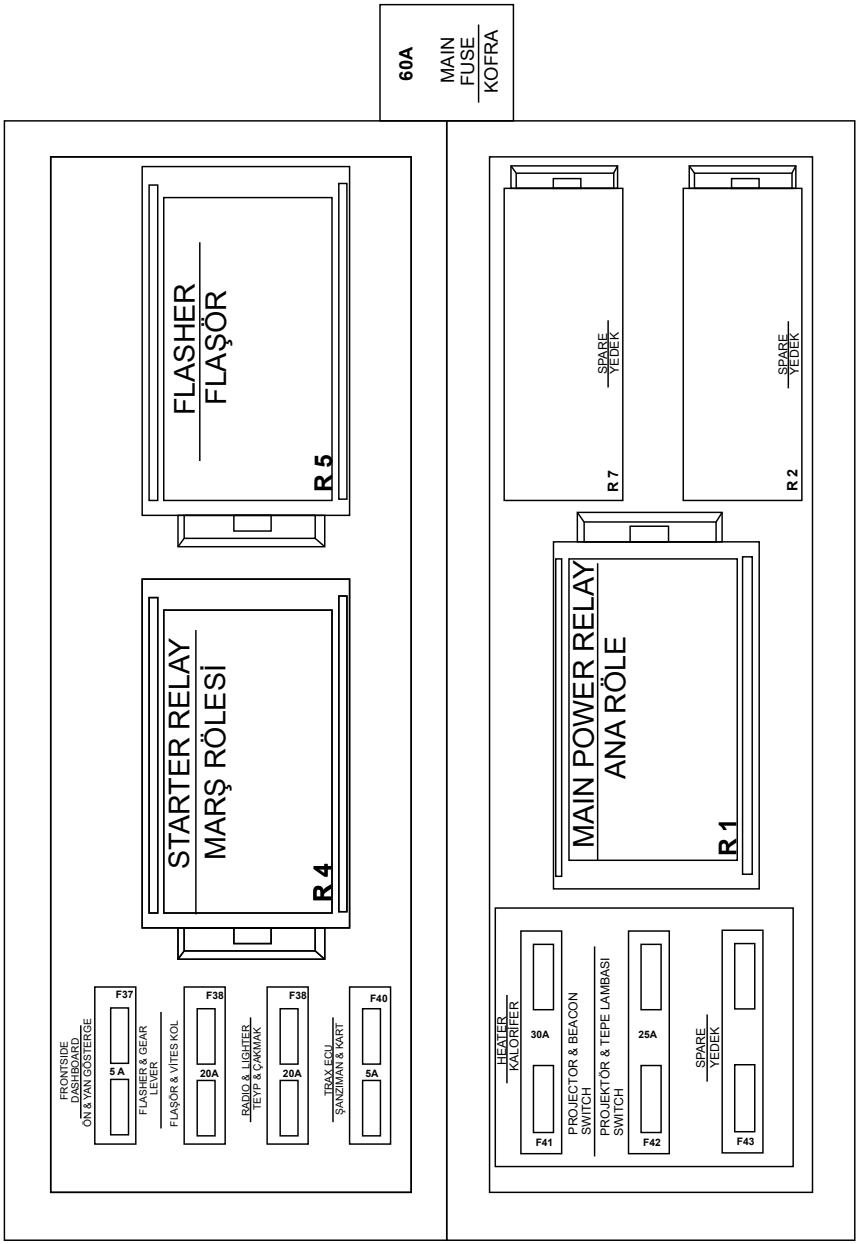
Relays

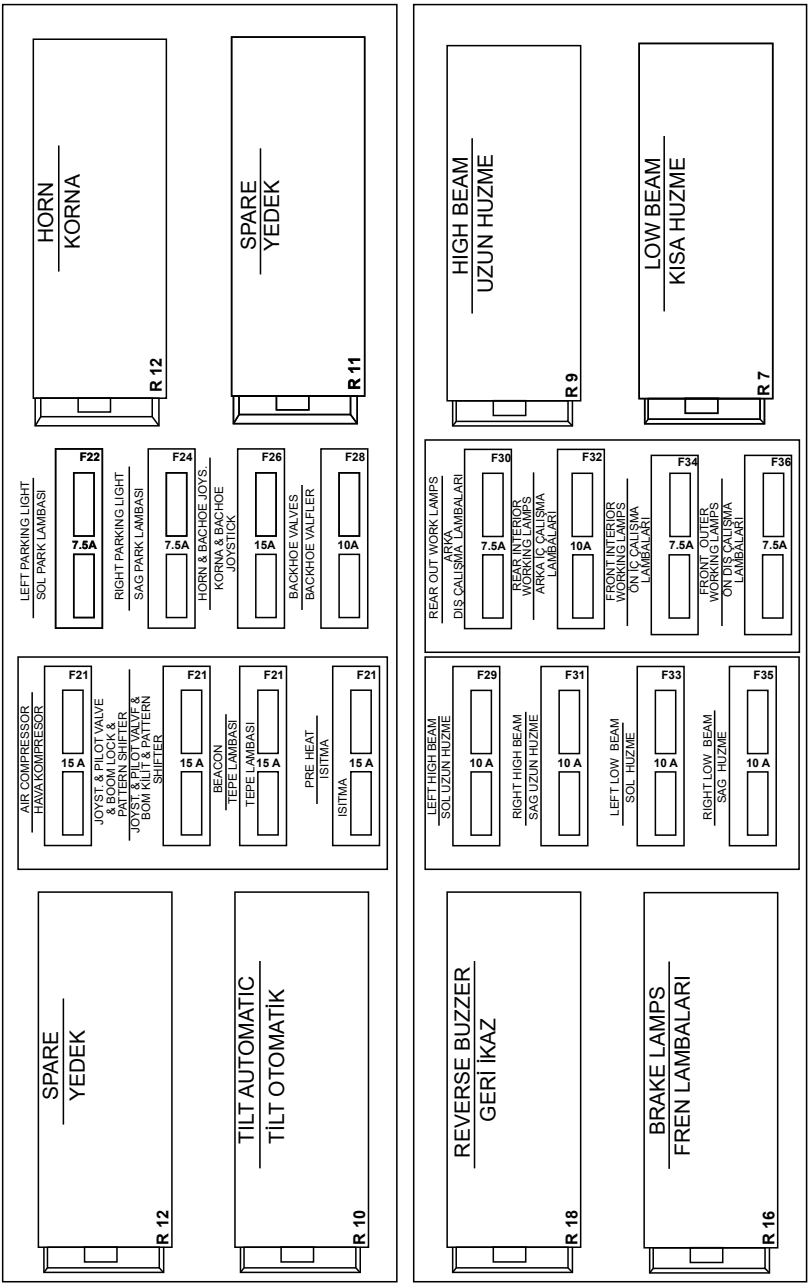
Relays are right under the fuses, on the side console. If any of the relays are broken, identify the cause and remedy the malfunction before replacing the relay.

⚠ WARNING
Always replace broken relays with replacements of equal value to avoid damaging the electrical system. Do not attempt to remove any of these units while the vehicle is running!




F11
SELECTOR LEVEL
15A
SİNYAL KOLU
F12
REVERSE BUZZER
10A
GERİ İKAZ
F13
FUELINJEC. PUMP
10A
YAKIT ENJ. POMPA
F14
TILT AUTOMATIC
7.5A
KAZAN TESVİYE
F15
ATTACHMENT
10A
ATAŞMAN
F1
BRAKE PROX. SWITCH RELAY
7.5A
FREN PROX. SWITCH RÖLE
F2
GEAR LEVER
15A
VİTES KOLU
F3
FLASHER & INTERIOR LAMP
15A
FLAŞÖR & İÇ AYDINLATMA LAMBASI
F4
PARKIING SWITCH& FRONT WORKING LAMPS
10A
PARK SWITCH& ÖN ÇALIŞMA LAMBALARI
F5
4WS/SRS
10A
4WS/SRS
F16
SEAT & RIGHT & LEFT STAR PROX. SWITCH
15A
KOLTUK & SAĞ & SOL DENGE AYAK OKUYUCU
F17
HYDRA CLAMP & SIDE SHIFTER
10A
KIZAK KİLİTLEME & KIZAK KAYDIRMA
F18
REAR WIPER MOTOR& REAR WIPER SWITCH
15A
ARKA SİLECEK MOTOR& ARKA SİLECEK SWITCH
F19
FRONT WIPER
15A
ÖN SİLECEK
F20
REVERSE FAN
20A
TERS FAN
F6
UNLOADER/FLOAT
10A
UNLOADER/LOADER YÜZER
F7
SIDE FRONT DASHBOARD FUEL-WATER SEPERATOR
3A
YAN ÖN GÖSTERGE YAKIT SU AYIRICI
F8
TRAX-AUTO-HDL-SPEED SENSOR
10A
TRAX-AUTO-HDL-HIZ SENSÖR
F9
4X4 & FNR JOYSTICK
15A
4X4 & FNR JOYSTICK
F10
HEATER SWITCH
15A
KALORİFER ANAHTAR


60A
MAIN FUSE
KOFRA
FLASHER
FLAŞÖR
R 5
STARTER RELAY
MARŞ RÖLESİ
R 4
FRONTSIDE DASHBOARD
ÖN & YAN GÖSTERGE
F37
5 A
FLASHER & GEAR LEVER
FLAŞÖR & VİTES KOL
F38
20A
RADIO & LIGHTER
TEYP & ÇAKMAK
F38
20A
TRAX ECU
ŞANZIMAN & KART
F40
5A
R 7
SPARE
YEDEK
R 2
SPARE
YEDEK
MAIN POWER RELAY
ANA RÖLE
R 1
HEATER
KALORİFER
30A
F41
PROJECTOR & BEACON SWITCH
PROJEKTÖR & TEPE LAMBASI SWITCH
25A
F42
SPARE
YEDEK
F43


SPARE
YEDEK
R 12
TILT AUTOMATIC
TİLT OTOMATİK
R 10
REVERSE BUZZER
GERİ İKAZ
R 18
BRAKE LAMPS
FREN LAMBALARI
R 16
HORN
KORNA
R 12
SPARE
YEDEK
R 11
HIGH BEAM
UZUN HUZME
R 9
LOW BEAM
KISA HUZME
R 7
F21
15 A
AIR COMPRESSOR
HAVA KOMPRESÖR
JOYST. & PILOT VALVE
& BOOM LOCK &
PATTERN SHIFTER
JOYST.& PILOT VALVE &
BOOM LOCK & PATTERN
SHIFTER
BEACON
TEPE LAMBASI
PRE HEAT
ISITMA
F22
7.5A
LEFT PARKING LIGHT
SOL PARK LAMBASI
RIGHT PARKING LIGHT
SAG PARK LAMBASI
F24
7.5A
HORN & BACHOE JOYS.
KORNA & BACHOE
JOYSTICK
F26
15A
BACKHOE VALVES
BACKHOE VALFLER
F28
10A
F29
10 A
LEFT HIGH BEAM
SOL UZUN HUZME
F31
10 A
RIGHT HIGH BEAM
SAG UZUN HUZME
F33
10 A
LEFT LOW BEAM
SOL HUZME
F35
10 A
RIGHT LOW BEAM
SAG HUZME
F30
7.5A
REAR OUT WORK LAMPS
ARKA
DIŞ ÇALIŞMA LAMBALARI
F32
10A
REAR INTERIOR
WORKING LAMPS
ARKA İÇ ÇALIŞMA
LAMBALARI
F34
7.5A
FRONT INTERIOR
WORKING LAMPS
ÖN İÇ ÇALIŞMA
LAMBALARI
F36
7.5A
FRONT OUTER
WORKING LAMPS
ÖN DIŞ ÇALIŞMA
LAMBALARI

5.19 Checking Battery Acid Level

Checking Battery Acid Level

Maintenance – free batteries used in normal climate conditions don't need acid refill process. However, acid level should be checked in some cases such as long-term usage in tropical climate conditions, over-charge of alternator etc.

1-) Park the vehicle on a flat surface, activate park brake, and change the gear into neutral position. Lower the backhoe and loader arms to ground level. Stop the engine and remove the ignition key.

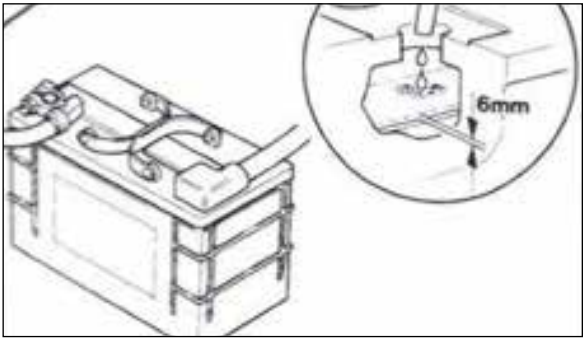
2-) Loosen and remove the bolts located under the right step frame.

⚠ WARNING
Add acid into battery. It may flow out which may cause injuries.

3. Check the color indicator

- Green : Ok.
- White : Add pure water into battery
- Black : Charging required

⚠ WARNING
Acid level should 6 mm above the plates. If required add pure or deionized water to keep the level.



⚠ WARNING
Vapor of the battery acid is explosive. DO NOT smoke near the batteries when they are being transported. Battery acid contains sulphuric acid. It may cause injuries when being contacted. Always wear protection glasses when working with batteries. Handle the batteries carefully to avoid split out. DO NOT adduct metal objects to the poles of the batteries. They may cause shortcut problem. Turn of all the switches in the cabinet before removing or installing the batteries. Always start from the negative (-) pole when removing the battery. Always start from the positive (+) pole when installing the battery. Always charge the battery away from then vehicle and in good ventilated areas. Deactivate the charging circuit before installing or removing the battery. Wait approximately 5 minutes after placing the battery before connecting the poles

⚠ WARNING
Disconnect battery and alternator before any welding process on the vehicle.

First Aid : Battery Acid

If battery acid;

CONTACT WITH EYES
Wash your eyes immediately of about 15 minutes and ask for medical help.

SWALLOWED
DO NOT try to throw out. Try to drink water or milk in access amount. Ask for medical help immediately

CONTACT WITH SKIN
Wash the contaminated area with water. Remove your clothe

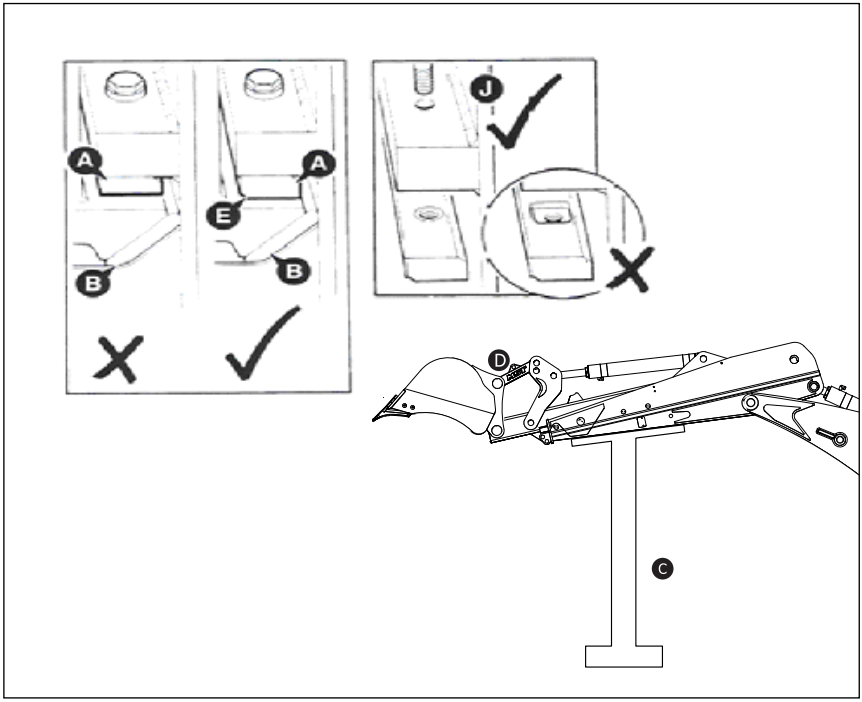
5.20 Telescopic Arm Abrasion Fibers

Telescopic arm worn-out tampons are interchangeable parts fixed with screws. These tampons support the inner side of the telescopic arm and serve as guide while extending and retracting the arm. The following is the description of controlling them and if necessary, to adjust them.

There are two sets of tampons; front and rear. Both sets are also formed by upper worn-out tampons displayed with **A**, and lower worn-out tampons displayed by **B**.
A The upper worn-out tampons, cannot be adjusted and should be replaced with new ones when they worn out.

B However, lower worn-out tampons displayed with **B** can be adjusted; these eliminate abrasion both on the upper and lower fibers. Lower fibers should also be replaced with the new ones when they are worn out.

A and **B** worn-out tampons must be replaced as set by authorized service technicians.



Upper Worn-out Tampons Replacement

- Park the machine on flat ground, pull the parking brake and shift the gear to neutral. After positioning the Boom and the Telescopic Arm as shown in C, retract the telescopic arm shown in D. The bucket must be adequately above the ground; the Telescopic Arm must be supported.

- Switch off the engine and remove the ignition key
- Replace the worn-out tampons as displayed in E, until they are worn-out up to the depth of the groove, or before they are worn-out completely. If the cushions are worn out almost completely, they should be controlled more often than mentioned in the Service Schedule. In order to prevent the worn-out cushions or ladle for any damages, the cushions should be installed as indicated at J.

Control of Lower Worn-Out Tampons

Park the vehicle on flat ground, pull the parking brake and shift the gear to neutral. Stop the engine. Support the Boom and the Telescopic Arm as shown in figure .

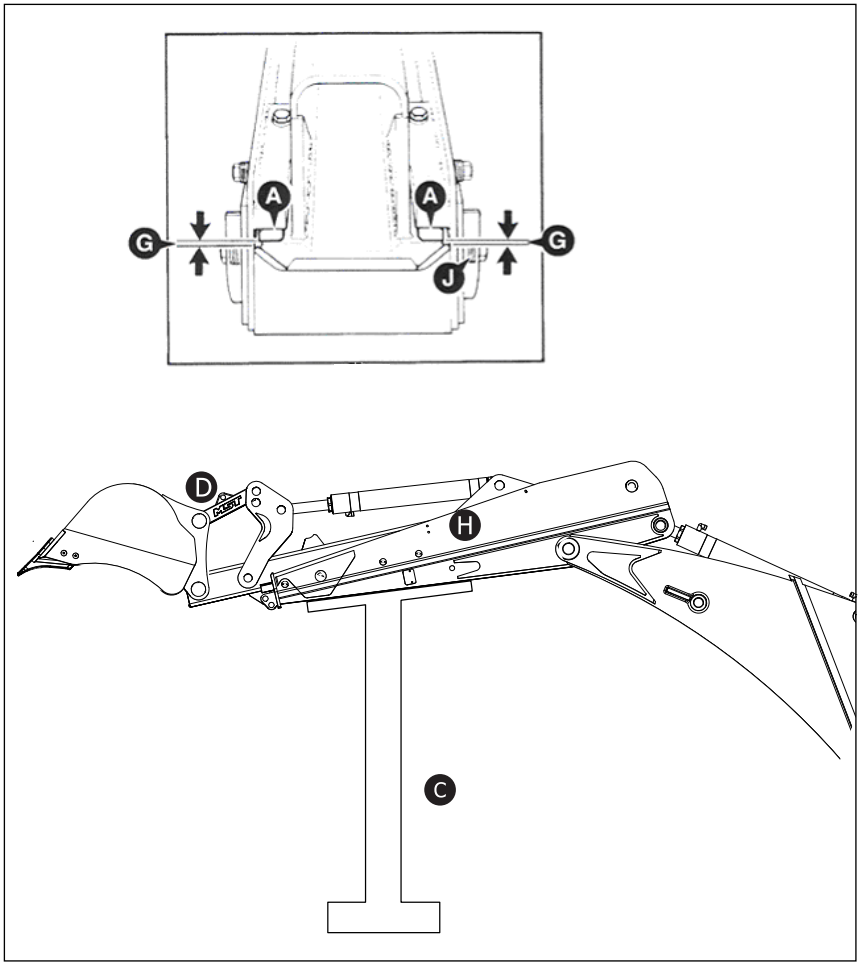
Clean the slippery surfaces on the telescopic arm using a suitable solution (solvent).

Start up the engine. Retract the Telescopic Arm as shown in figure. The bucket must be adequately above the ground; the Telescopic Arm must be supported. Stop the engine again.

After cleaning the grease, mud, etc. off the slippery surface check the gap between the upper Telescopic Arm and the upper worn-out tampon A by looking. This gap should not be more than **1.5 mm**.

If the gap is more than **1.5 mm**, adjust as explained below:

After the adjustments are complete, smear grease on the slippery surfaces of the Telescopic Arm.



Note: Remember to repeat the procedure on the other side at each adjustment. If the gap is still more than **1.5 mm** after all the adjustment washers shown as **J** are removed, worn-out tampons **A** and **B** must be replaced as set by an authorized service technician.

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MST CONSTRUCTION EQUIPMENT YATIRIM A.Ş.