

DRIVING & CHASSIS

CHAPTER 3

DRIVING & CHASSIS

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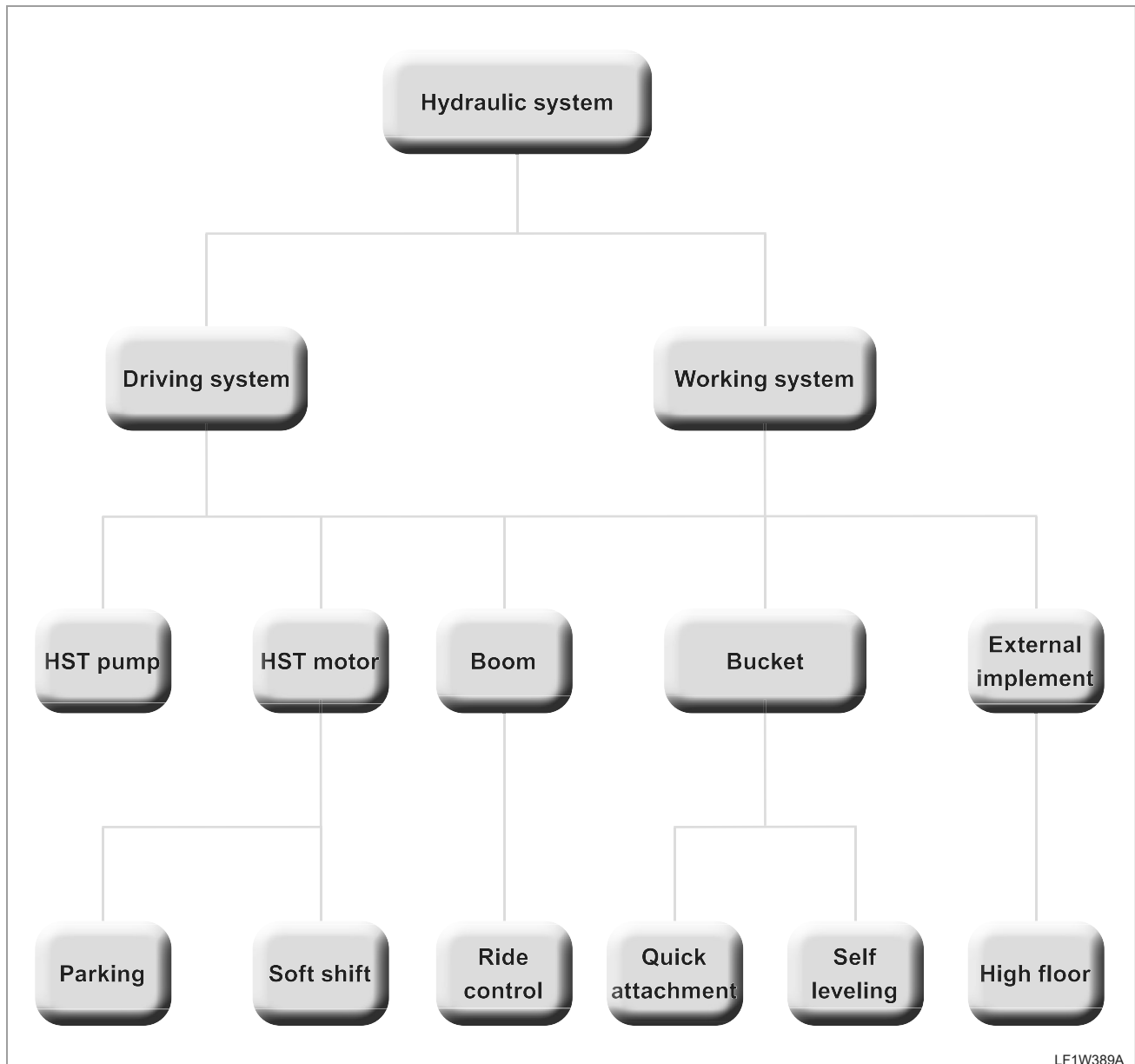
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1. DRIVING SYSTEM

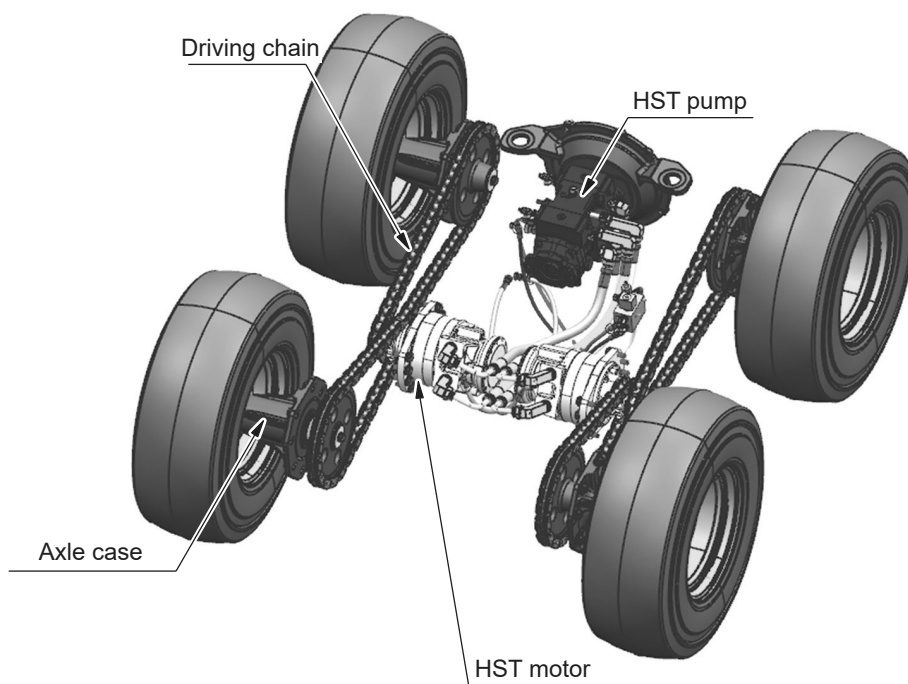
1.1 OVERVIEW

As the engine's rotating power is supplied to the HST pump through the coupling assembly of the engine flywheel, the hydraulic oil pressure built in the HST pump is delivered to the driving HST motors on the left and right sides of the vehicle.

Meanwhile, the front and rear wheels are installed on the axle cases in a row and the sprocket of each axle case is connected and fixed to the driving motor with a chain to deliver rotating power from the driving motor to the wheels.



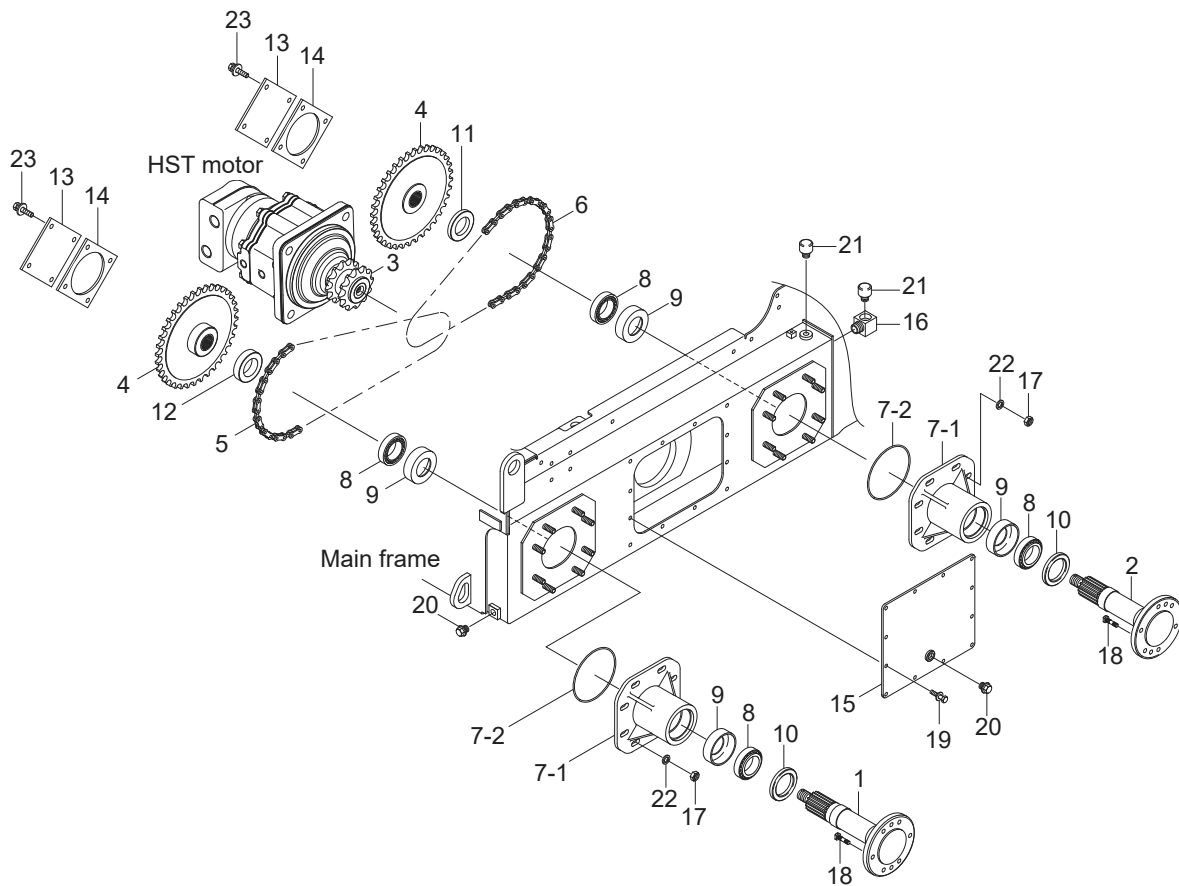
1.2 MAJOR SPECIFICATION



LF1W301A

Item	Model	HS80V	HS120V	
	Nominal Horsepower (HP)	66	74	
	Unit	1 speed	1 speed	2 speed
Engine rotation speed (rated)	rpm	2,400		
Engine rotation speed (high idle)	rpm	2,550		
Travel pump speed	rpm	2,550		
Travel pump capacity	cc/rev	43.5		
	LPM	111		
Travel motor capacity	cc/rev	470	520	310
Rotation speed of travel motor output shaft	rpm	236	213	358
No. of drive sprocket teeth		11		
No. of axle sprocket teeth		31	30	
Chain gearshift ratio		0.35	0.37	
Axle rotation speed	rpm	84	78	131
Tire specifications		10 x 16.5 - 8PR	12 x 16.5 - 12PR	
Tire outside diameter	mm	794	845	
Tire rolling circumference	mm	2,353	2,496	
Machine speed (calculation)	km/hr	11.4	11.7	19.6

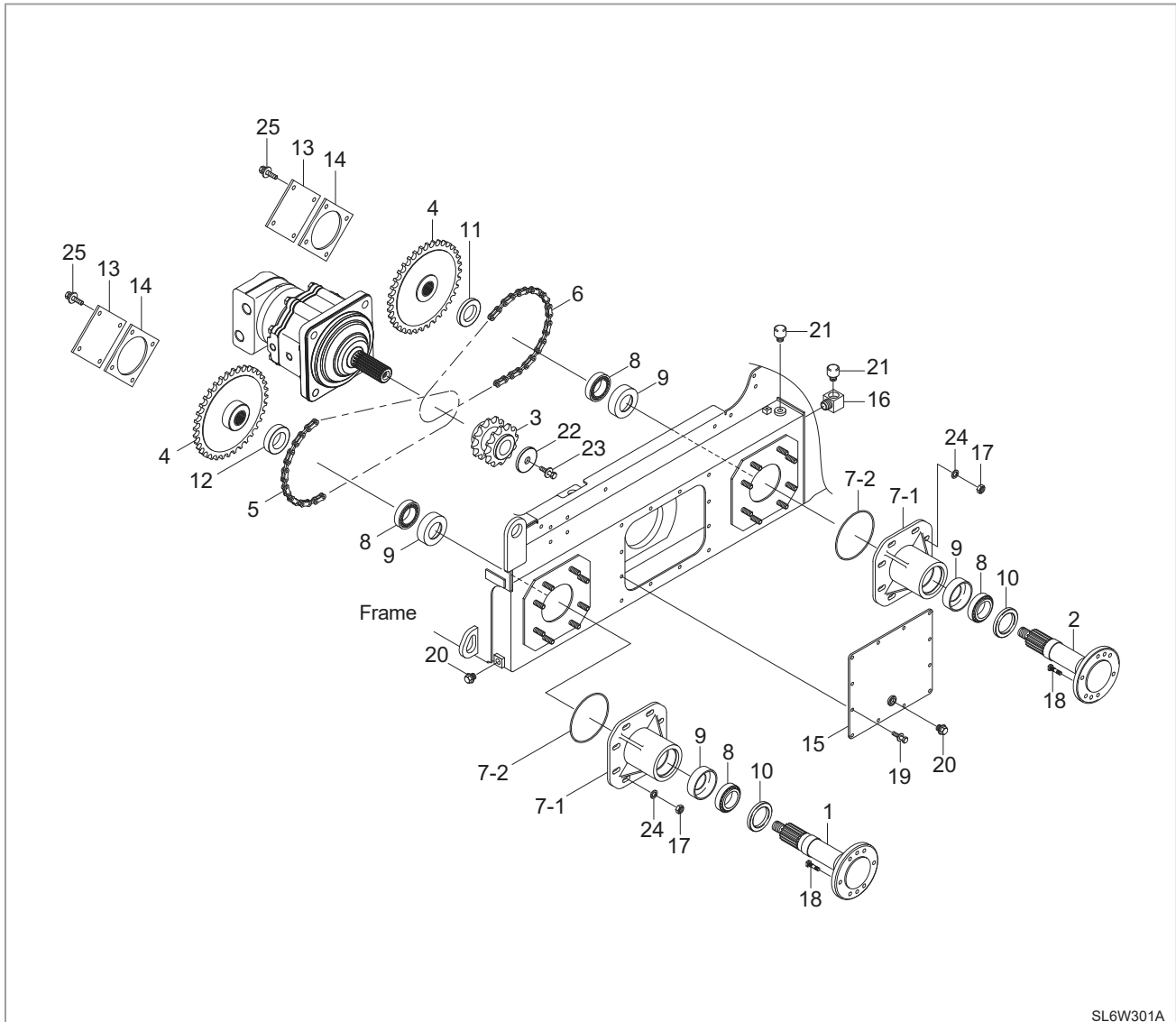
1.3 EXPLODED VIEW (HS120V)



LF1W302A

- | | | |
|----------------------------|-----------------------|--------------------------|
| (1) Front axle | (11) Spacer | (21) Plug |
| (2) Rear axle | (12) Spacer | (22) Air breather |
| (3) Center sprocket | (13) Cover | (23) Special washer |
| (4) Front sprocket | (14) Gasket | (24) Bolt with washer |
| (5) Front chain (64 Links) | (15) Cover | (25) Washer |
| (6) Rear chain (60 Links) | (16) Gasket | (26) Nut |
| (7) Axle case | (17) Heater block | (27) Split pin |
| (8) Taper roller bearing | (18) Hex. nut | (28) High tension washer |
| (9) Bearing cap | (19) Wheel bolt | (29) Bolt with washer |
| (10) Seal | (20) Bolt with washer | |

1.3 EXPLODED VIEW (HS80V)

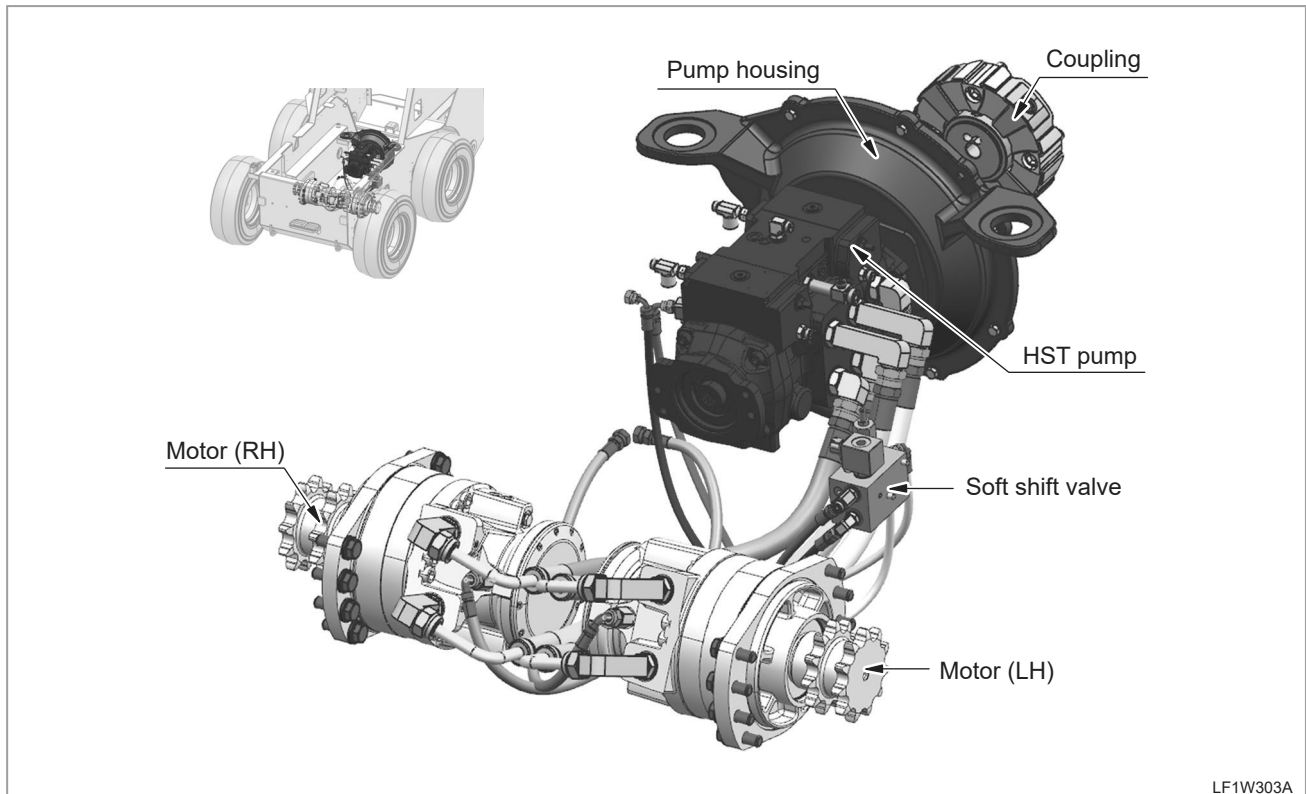


SL6W301A

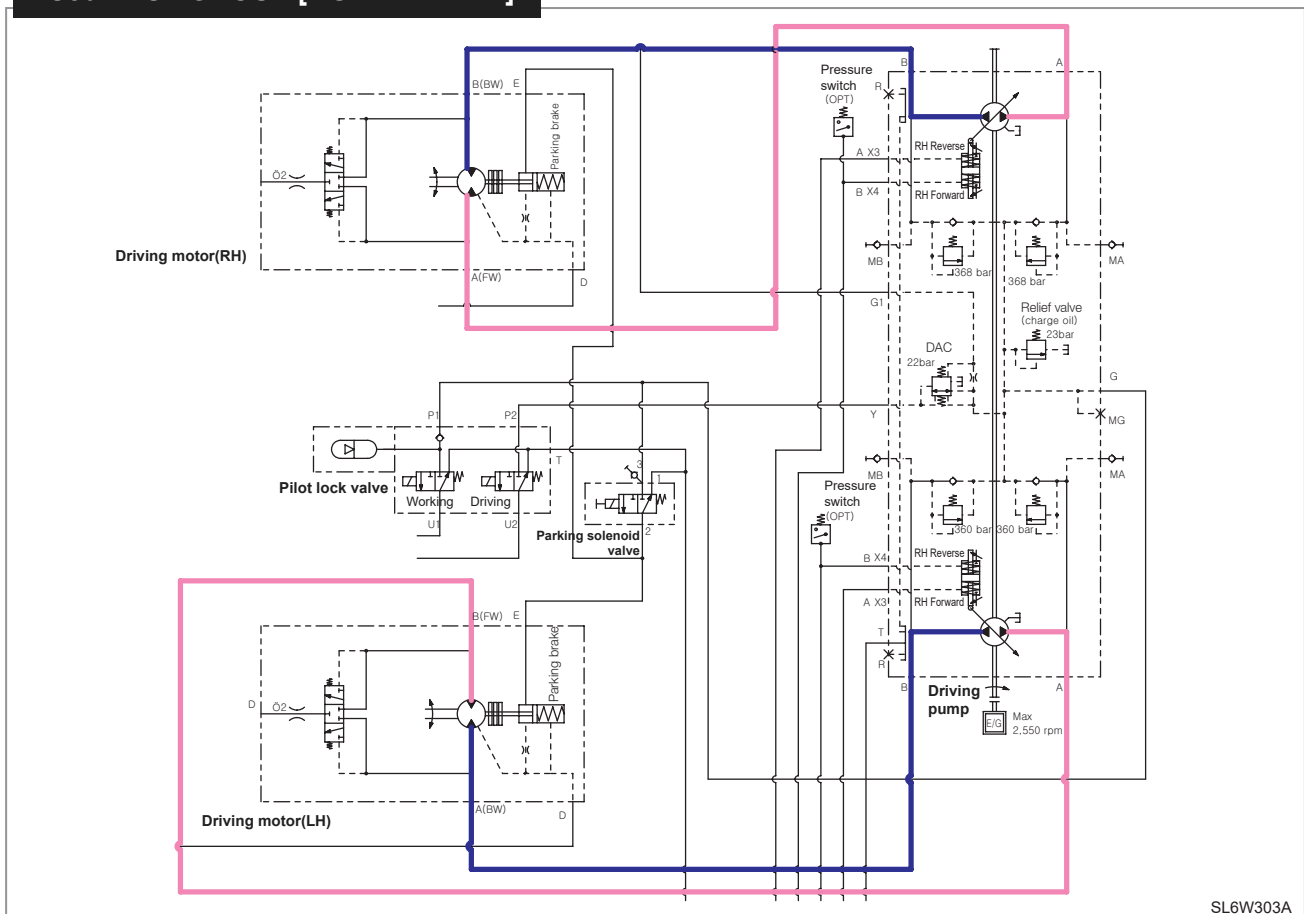
- | | | |
|----------------------------|-----------------------|--------------------------|
| (1) Front axle | (11) Spacer | (21) Air breather |
| (2) Rear axle | (12) Spacer | (22) High tension washer |
| (3) Center sprocket | (13) Cover | (23) Bolt with washer |
| (4) Front sprocket | (14) Gasket | (24) Washer |
| (5) Front chain (50 Links) | (15) Cover | (25) Bolt with washer |
| (6) Rear chain (78 Links) | (16) Heater block | |
| (7) Axle case | (17) Hex. nut | |
| (8) Taper roller bearing | (18) Wheel bolt | |
| (9) Bearing cap | (19) Bolt with washer | |
| (10) Seal | (20) Plug | |

1.4 PRINCIPLE OF POWER TRANSFER & SPECIFICATIONS OF COMPONENTS

1.4.1 POWER TRANSFER SYSTEM



HS80V HST GROUP [1 SPEED TYPE]

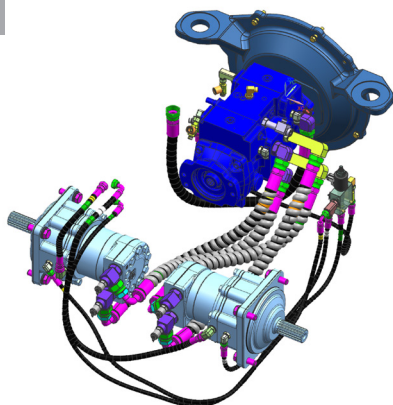


When the HST pump receives a forward drive signal input from the pilot line, oil travels through the red line and passes through the piston in the motor, rotating the motor shaft. After passing through the piston, the oil returns to the HST pump.

1.4.2 SPECIFICATIONS

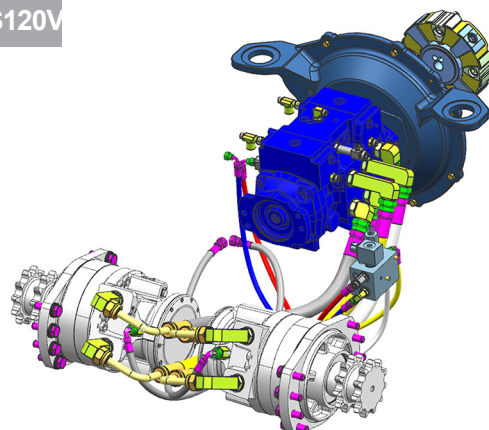
HST GROUP

HS80V



SL6W304A

HS120V



LF1W306A

Engine

- Rotation speed (high idle) : 2,550 rpm

Pump

- Rotation speed (high idle) : 2,550 rpm
- Capacity : 43.5 cc/rev
- Flow rate : 110.9 lpm

Motor

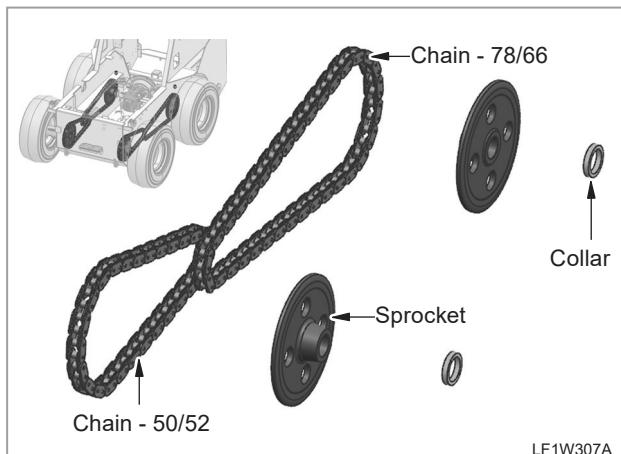
- HS80V Capacity : 470 cc/rev / HS120V Capacity : 520 cc/rev, 310 cc/rev

$$\text{Motor rpm} = \text{Pump rpm} \times \frac{\text{Pump displacement}}{\text{Motor displacement}}$$

→ HS80V Motor rpm : 236 rpm / HS120V Motor rpm : 213 rpm, 358 rpm

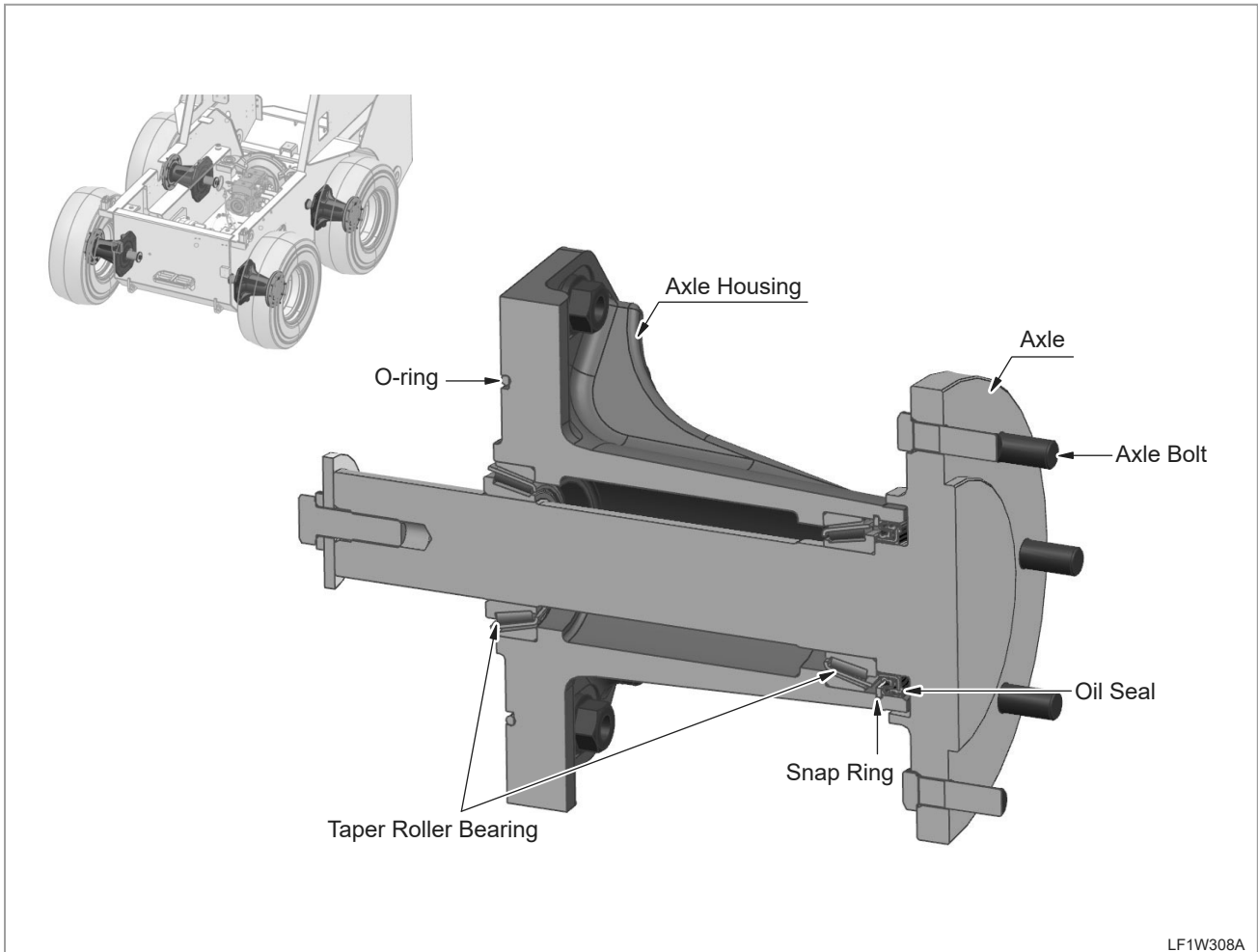
DRIVING CHAIN GROUP

No. of Chain link : HS80V(55-78), HS120V(52-66)



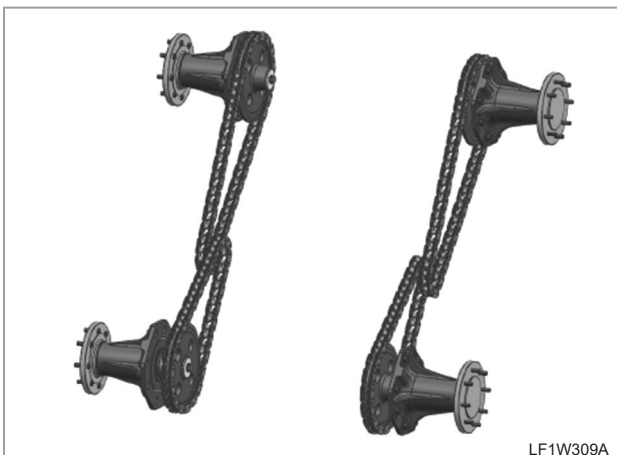
LF1W307A

AXLE GROUP



LF1W308A

DRIVING CHAIN GROUP



LF1W309A

Chain

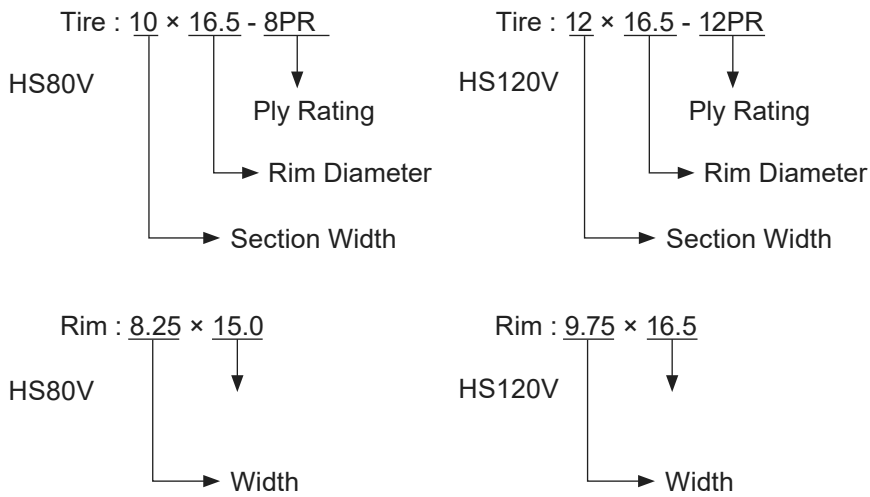
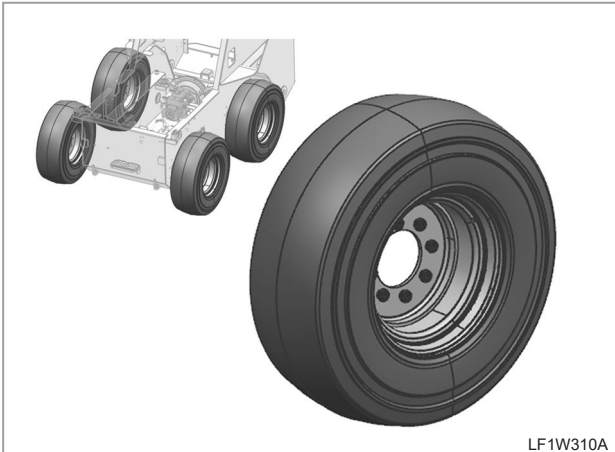
- No. of links : HS80V(50 / 78), HS120V(52 / 66)
- Pitch : HS80V(25.40mm), HS120V(31.75mm)

Sprocket

- No. of motor sprocket teeth : 11 EA
- No. of axle sprocket teeth : HS80V(31 EA), HS120V(30 EA)
- Gear ratio : HS80V - 11/31 (0.35), HS120V - 11/30 (0.37)
- Motor rpm : HS80V(236 rpm), HS120V(213 rpm, 358rpm)
- Axle rpm : HS80V(84 rpm), HS120V(78 rpm, 131 rpm)

* Axle rpm = Motor rpm * Gear Ratio

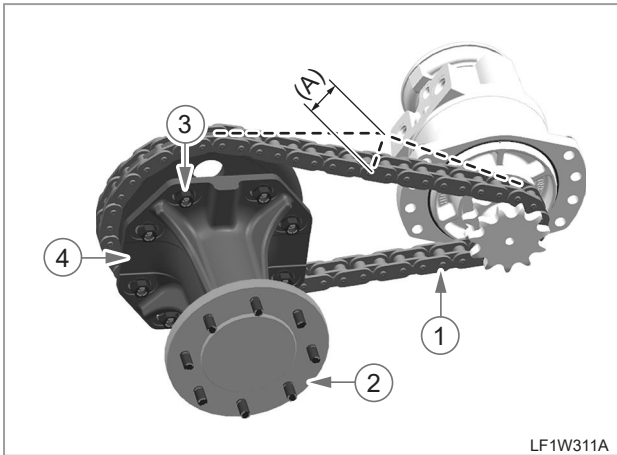
TIRE GROUP



- Tire OD : HS80V(794 mm), HS120V(845 mm)
- Rolling Circumference: HS80V(2353 mm), HS120V(2496 mm)
- Axle rpm : HS80V(84 rpm), HS120V(78 rpm , 131 rpm)
- $\text{speed[km/h]} = (60 \times 10^{-6}) \times \text{Rolling Circumference} \times \text{Axle rpm}$
- Speed : HS80V(11.4 km/h), HS120V(11.7 km/h , 19.6 km/h)

1.5 CHECK & ADJUSTMENT

1.5.1 DRIVING CHAIN TENSION ADJUSTMENT



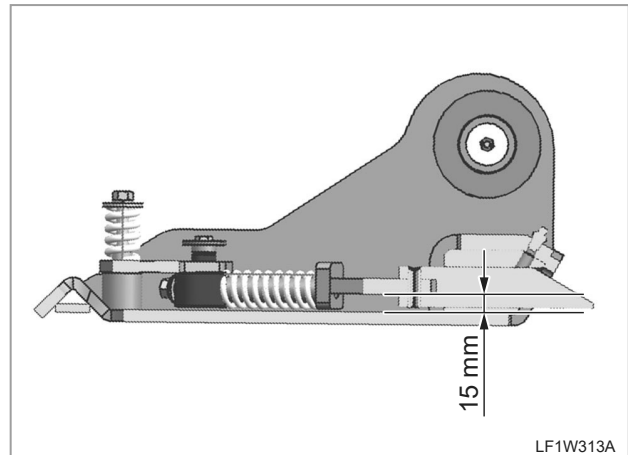
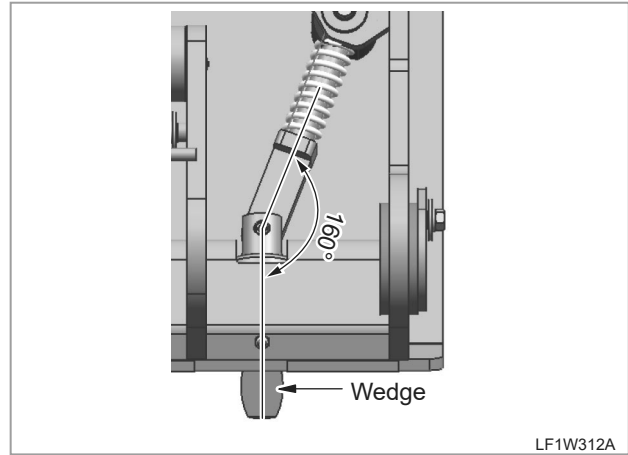
- | | |
|-----------------|---------------|
| (1) Lower chain | (3) Lock nut |
| (2) Axle | (4) Axle case |

1. Turn the axle so that the lower chain has no end play.
2. Move the axle case to adjust the end play (A) of the upper chain to the specification, and then tighten its mounting nut completely.

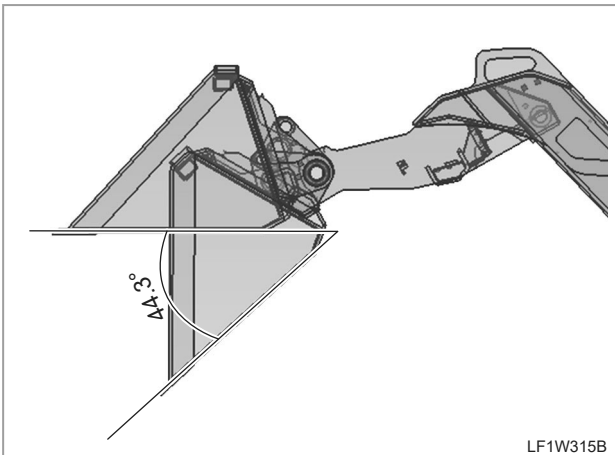
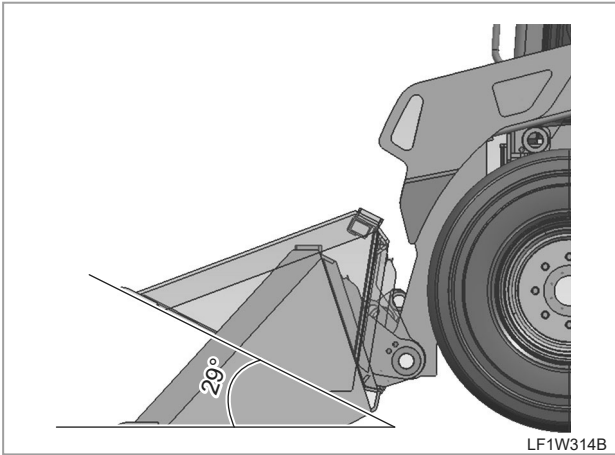
**Upper chain play (A) : 10 ~ 15 mm
(0.394 ~ 0.591 in.)**

1.5.2 QUICK ATTACHMENT CHECK

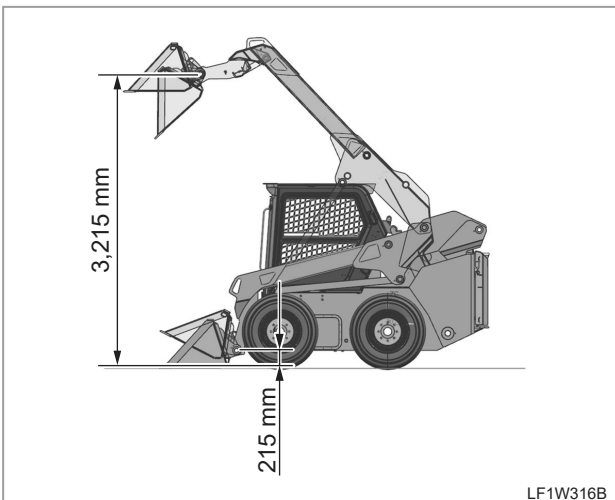
WEDGE ASSEMBLY ANGLE



BUCKET APPLYING ANGLE

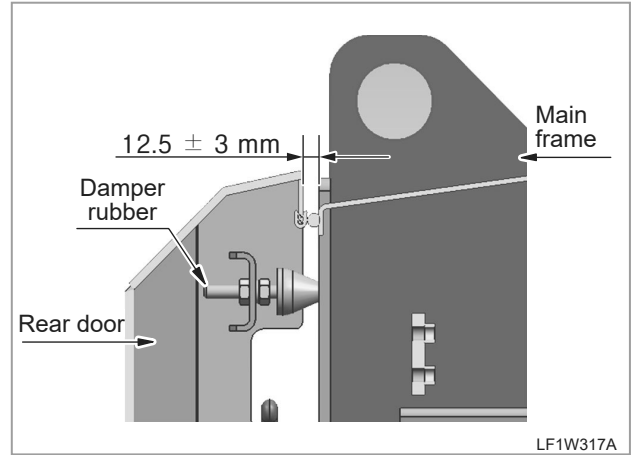


INITIAL BOOM FRAME LOCATION



1.5.3 REAR DOOR OPERATION CHECK

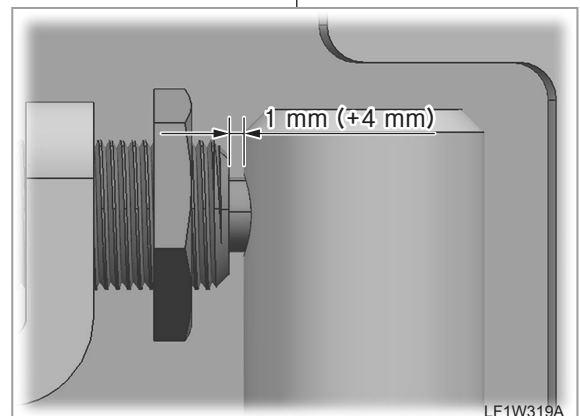
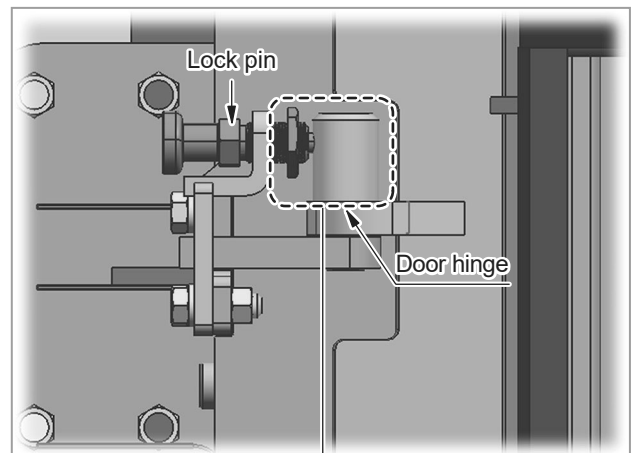
CLEARANCE OF REAR DOOR & MAIN FRAME



REMARKS

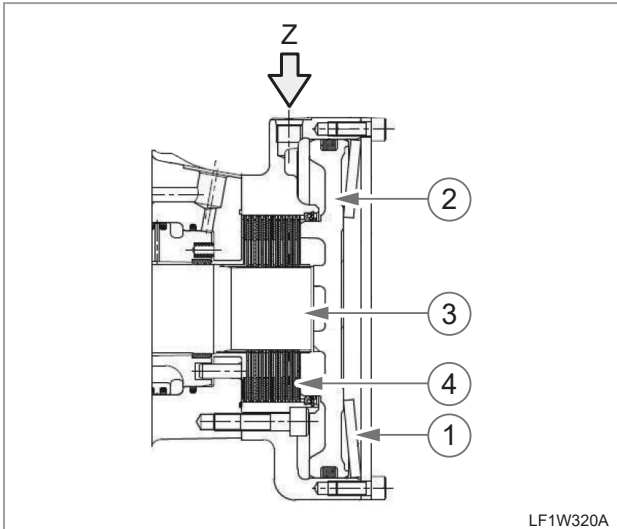
- Deflection of the rubber damper by the main frame when tightened
Deflection: 2-3 mm

CLEARANCE OF REAR DOOR, LOCK PIN, DOOR HINGE



2. BRAKE (PARKING BRAKE)

2.1 OVERVIEW & OPERATING PRINCIPLE



Basically, when pressure is not built up in the hydraulic system, the parking brake of the HST (driving) motor is operated.

As shown in the figure, the hydraulic pressure is no longer applied on the brake area, and the disc spring (1) pushes the piston (2) that then compresses the discs. Then, as the drive shaft (3) is connected to the discs (4) with the splines, and the discs are fixed to the housing, this driving power is lost, thereby resulting in braking.

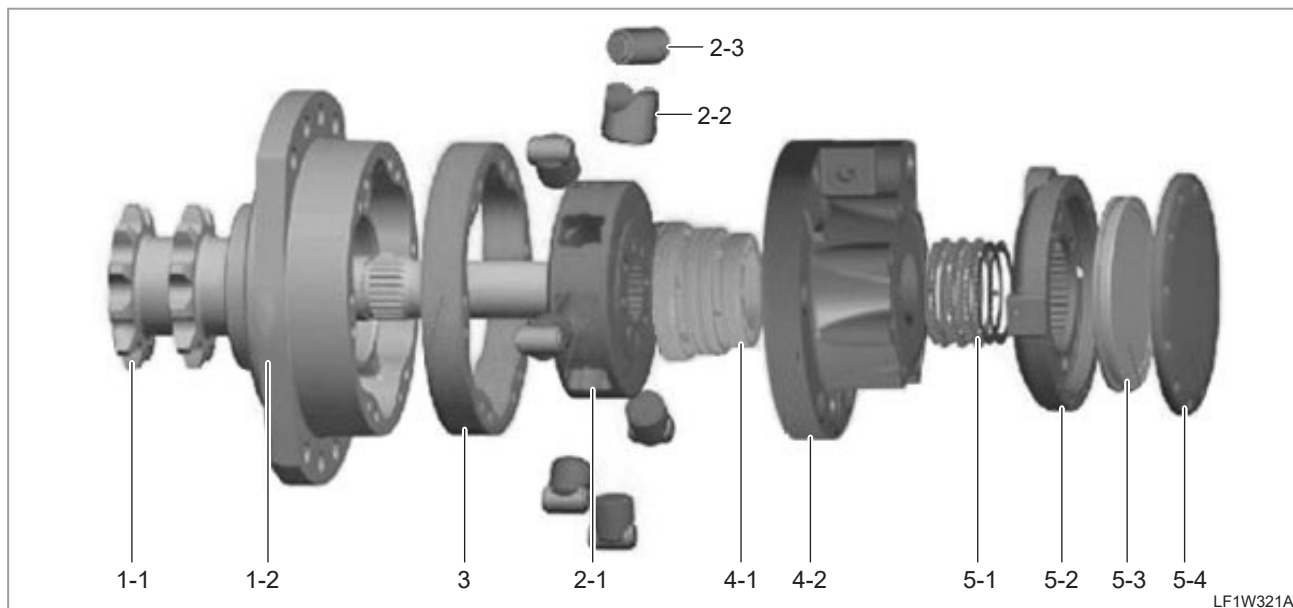
On the other hand, when the hydraulic pressure is supplied to the brake port Z, the brake piston is pushed, resulting in pushing the disc spring in the opposite direction. As a result, the parking brake is released and the driving power is restored and becomes ready to be used.

2.2 STRUCTURE & COMPONENTS



The brake packs are installed in the driving motors while the driving motors are located on the left and right sides of the vehicle.

2.2.1 1 SPEED MODEL

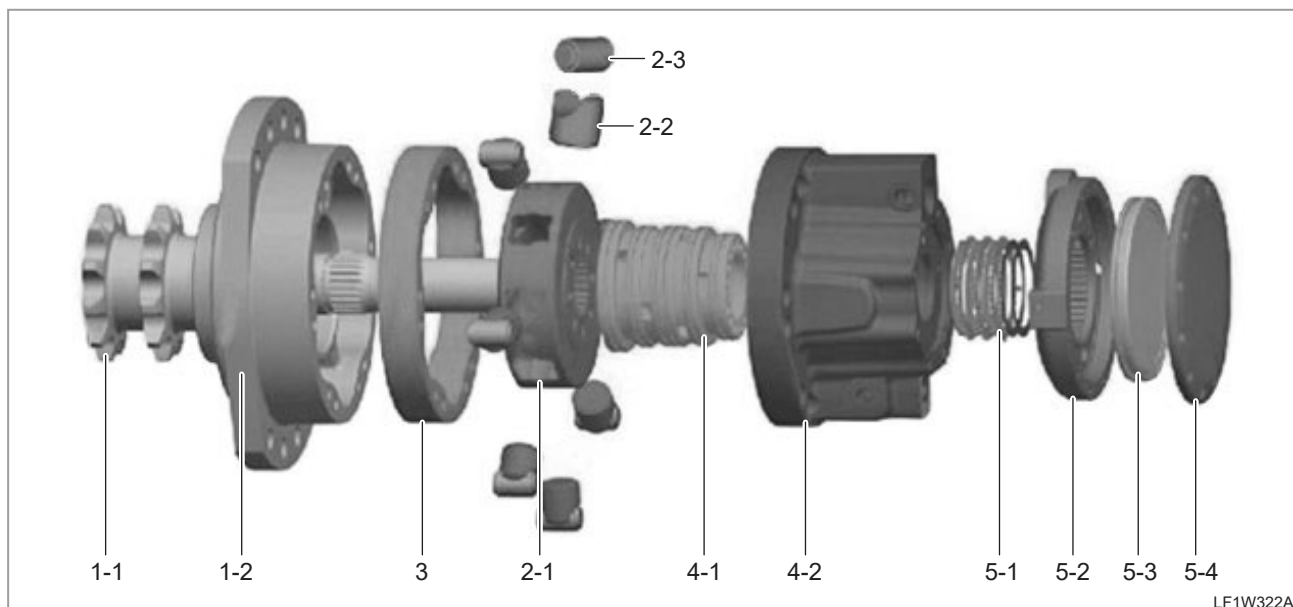


- (1) Front case group
- (1-1) Shaft
- (1-2) Front case
- (2) Roary group
- (2-1) Block
- (2-2) Piston

- (2-3) Roller
- (3) Cam
- (4) Rear case group
- (4-1) Distributor
- (4-2) Rear case
- (5) Brake group

- (5-1) Disc pack
- (5-2) Housing
- (5-3) Piston
- (5-4) Ene cover

2.2.2 2 SPEED MODEL



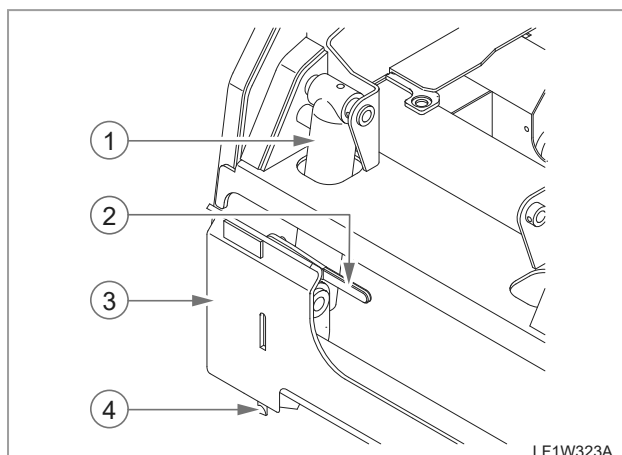
- (1) Front case group
- (1-1) Shaft
- (1-2) Front case
- (2) Roary group
- (2-1) Block
- (2-2) Piston

- (2-3) Roller
- (3) Cam
- (4) Rear case group
- (4-1) Distributor
- (4-2) Rear case
- (5) Brake group

- (5-1) Disc pack
- (5-2) Housing
- (5-3) Piston
- (5-4) Ene cover

3. WORKING SYSTEM

3.1 WORKING SYSTEM HOLDER (QUICK COUPLER)

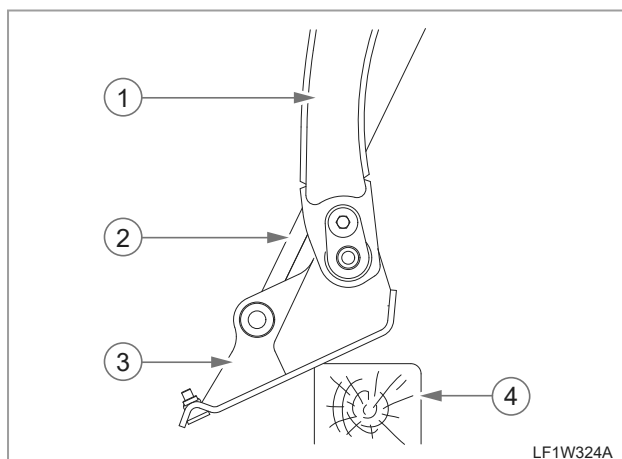


- (1) Bucket cylinder
(2) Hand lever
(3) Working system holder
(4) Lock pin

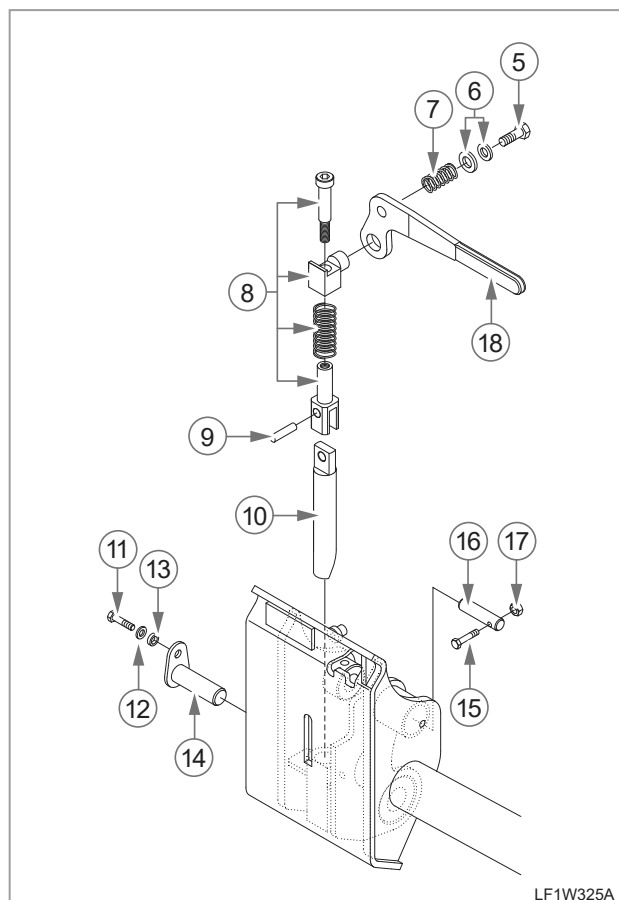
The attachment holder is designed to attach and detach an attachment to/from the body easily.

This is connected to the bucket cylinder with the pin, cap screw, and lock nut, and the hand lever and lock pin are used to lock an attachment onto the attachment holder.

REMOVAL



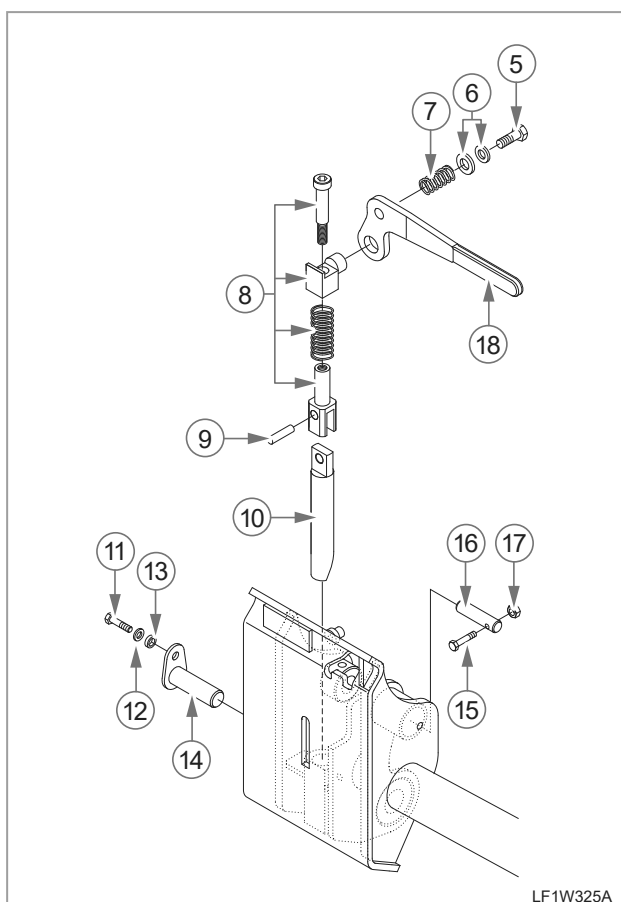
- (1) Boom
(2) Bucket cylinder
(3) Workin system holder
(4) Block



- (5) Hex. bolt
(6) Plain washer
(7) Spring
(8) Control unit
(9) Spring pin
(10) Pin
(11) Bolt
(12) Washer
(13) Spacer
(14) Pin
(15) Bolt
(16) Pin
(17) Nut
(18) Hand lever

1. Remove the attachment from the attachment holder.
2. Raise the boom and place a chock block behind the attachment holder.
3. Lower the boom so that the bottom of the attachment holder is supported by the block.
4. Move the bucket cylinder to place the front of the attachment holder on the ground.
5. Stop the engine.
6. Operate the control lever to release pressure in the system.
7. Undo the bolt (15), lock nut and pin to separate the bucket cylinder from the attachment holder.
8. Undo the bolt (11), washer, spacer and pin to separate the boom cylinder from the attachment holder.

INSTALLATION



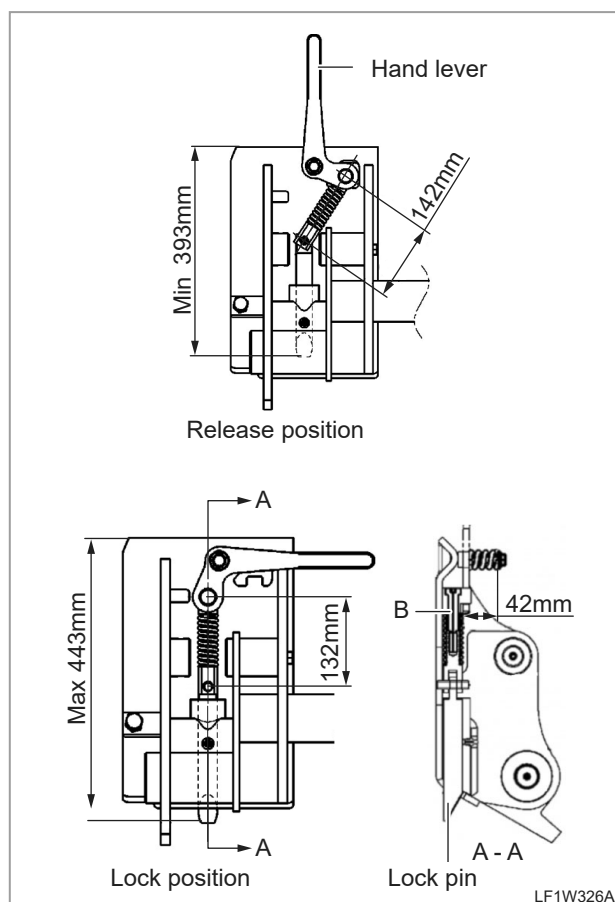
- | | |
|------------------|-----------------|
| (5) Hex. bolt | (12) Washer |
| (6) Plain washer | (13) Spacer |
| (7) Spring | (14) Pin |
| (8) Control unit | (15) Bolt |
| (9) Spring pin | (16) Pin |
| (10) Pin | (17) Nut |
| (11) Bolt | (18) Hand lever |

1. Align the attachment holder with the boom.
2. Place a hydraulic jack under the attachment holder and raise the attachment holder until its bushing is aligned with the hinge of the boom.
3. Install the boom pin (14), and then install the bolt (11), spacer, and washer.
4. After installing the bucket cylinder pin (16), install the bolt (15) and nut (17).
5. Grease the pins (14 & 16) through the grease fitting.

Hex. bolt (5)

Tightening torque..... 42.1 ~ 58.8 Nm
4.3 ~ 6.0 kgf-m
31.0 ~ 43.3 lb-ft

LOCK PIN ADJUSTMENT



1. Park the vehicle on level ground.
2. Stop the engine.
3. After pushing up the hand lever of the attachment holder, check that the lock pin is out of the bucket slot (in the release position).
4. Measure the distance from the top of the attachment holder to the pin end.
(If the distance is not 393 mm, adjust the bolt (B) to set the distance to 393 mm.)
5. Perform this procedure on the opposite side.

4. TROUBLESHOOTING

4.1 DRIVING HYDRAULIC SYSTEM/BRAKE

SYMPTOM	CAUSE	SOLUTION
The driving force on one side is weak. (Identical for the forward driving and reverse driving)	Insufficient oil in the tank	<ul style="list-style-type: none"> Check for leakage and add the oil as necessary.
	Loose pedal linkage	<ul style="list-style-type: none"> Adjust and reconnect the pedal linkage.
	Broken pump neutral bracket	<ul style="list-style-type: none"> Replace it. Check the neutral bracket (for loose bolt or excessive play).
	Damaged high-pressure line	<ul style="list-style-type: none"> Replace the line. Check the pump mounting bolt and HST motor.
	Damaged drive chain	<ul style="list-style-type: none"> Check the chain and the chain connecting linkage Replace any damaged part.
	Damaged HST motor shaft	<ul style="list-style-type: none"> Replace any defective part. Check the motor mounting bolt.
	Defective pump	<ul style="list-style-type: none"> Check and repair the defective part.
	Faulty HST pump. The driving force on one side is weak at first, but, in a few minutes, the driving force on both sides becomes weak.	<ul style="list-style-type: none"> Check and repair the defective part.
The driving force on one side is weak. (Only for the forward driving or reverse driving)	Excessive internal oil leakage or damaged control pump motor or HST motor	<ul style="list-style-type: none"> Check and repair any defective part. Clean the tank and the hydraulic lines. Replace the filter. Check the engine RPM and the hydraulic oil.
	Defective relief valve of the valve block	<ul style="list-style-type: none"> Replace the relief valve.
The driving force on one side is lost. (No hydraulic pressure delivered at all)	Stuck or damaged shuttle valve of the HST motor	<ul style="list-style-type: none"> Check and replace any defective part.
	Insufficient oil level in the oil tank	<ul style="list-style-type: none"> Check for oil leakage. Add the oil.
	Damaged coupling between the engine and pump	<ul style="list-style-type: none"> Check and replace any damaged part. Check for misalignment.
The driving force on both sides is lost. (No hydraulic pressure built at all)	Malfunctioning HST pump	<ul style="list-style-type: none"> Check and replace any damaged part.
	Damaged spline coupling (in the control pump)	<ul style="list-style-type: none"> Check and replace any damaged part.
The driving force on both sides is lost. (Overall hydraulic pressure built)	Damaged implement pump shaft	<ul style="list-style-type: none"> Check and replace any damaged part.
	Malfunctioning HST pump	<ul style="list-style-type: none"> Check and replace any damaged part.
	Defective relief valve of the HST pump	<ul style="list-style-type: none"> Check and replace any damaged part.
	Excessive internal leakage	<ul style="list-style-type: none"> Clean the tank and hydraulic lines. Replace the filter.
	Defective control pump or HST motor	<ul style="list-style-type: none"> Check the engine RPM and hydraulic oil specification.
	Excessively saggy drive chain	<ul style="list-style-type: none"> Adjust

SYMPTOM	CAUSE	SOLUTION
When driving the loader forward, it skews to a side.	Stuck control lever	<ul style="list-style-type: none"> Check for interference with other parts. Adjust it again.
When releasing the control lever, it does not return to its neutral position.	Incorrectly adjusted	<ul style="list-style-type: none"> Check if the centering spring is stuck or improperly adjusted. Adjust it again.
Noise from the final drive	No or insufficient lubricant	<ul style="list-style-type: none"> Check the oil inspection plug of the chain case. If the plug is free of oil, the oil amount is insufficient. Add oil in this case.
	Excessive vibration of the axle	<ul style="list-style-type: none"> Tighten the axle nut so that the axle does not spin.
	Locking pin missing on the wheel axle	<ul style="list-style-type: none"> Check and tighten the axle nut so that it does not spin.
The wheels on one side do not rotate.	Damaged drive chain	<ul style="list-style-type: none"> Check the chain and chain connecting linkage. Replace any damaged part.
Defective driving/hydraulic system	Defective shaft or key of the HST motor	<ul style="list-style-type: none"> Check and replace any damaged part. Refer to the driving/hydraulic system circuit diagrams.

SYMPTOM	CAUSE	SOLUTION
Faulty HST motor	Cavitation occurred or piston off the cam due to excessively low charge pressure	<ul style="list-style-type: none"> Check the charge pressure according to the equipment specification. If necessary, adjust, repair, or replace the charge pump (closed circuit) or another source of charge pressure (open circuit).
	2-Speed spool off the cam or partially moved (if equipped)	<ul style="list-style-type: none"> Check the case pressure according to the equipment specification. If the pressure is excessively high, check if the drain line is clogged.
	2-Speed pool partially moved due to low 2-speed shift pressure (if equipped)	<ul style="list-style-type: none"> Check the 2-speed shift pressure according to the equipment specification. If the pressure is excessively low, adjust, repair, or replace the source of the pressure.
	2-Speed spool partially moved and stuck in place (if equipped)	<ul style="list-style-type: none"> Check the 2-speed spool. If necessary, replace the spool and/or the motor housing.
	Motor hitting the frame and vibrating due to a loose motor mounting screw	<ul style="list-style-type: none"> Check that the motor mounting screw is properly tightened to the specification.
	Wheel mounted improperly or abnormal load applied on the motor output shaft	<ul style="list-style-type: none"> Check that the wheels are properly mounted and loads are properly arranged according to the equipment specification.
	Hydraulic line hitting the frame and vibrating due to improper installation	<ul style="list-style-type: none"> Check if the line is properly installed according to the equipment specification.
	Internally damaged radial piston motor	<ul style="list-style-type: none"> Remove and check the motor. Replace any defective part. If necessary, replace the whole motor.
	Air sucked in	<ul style="list-style-type: none"> Bleed the hydraulic line completely. Check that all connections are properly tightened.
Excessive pressure fluctuation	Brake not released fully, due to excessively low brake release pressure (if equipped)	<ul style="list-style-type: none"> Check the brake release pressure according to the equipment specification. If necessary, adjust, repair, or replace the source of the pressure.
	Internally damaged radial piston motor	<ul style="list-style-type: none"> Remove and check the radial piston motor. Replace any defective part. If necessary, replace the whole motor.
	Unbalanced or load changed	<ul style="list-style-type: none"> Check the load and load attachment according to the equipment specification, and then make any necessary adjustment.
Excessive speed fluctuation	Clogging or wrong size of the feed or return line	<ul style="list-style-type: none"> Check to ensure that the main lines for the motor A/B ports are not clogged and their sizes are according to the equipment specification.
	Internal oil leakage due to internal motor damage	<ul style="list-style-type: none"> Remove and check the motor while being careful with the piston ring. Replace any defective part. If necessary, replace the whole motor.
	Defective pump or pump controller	<ul style="list-style-type: none"> Check the pump and pump controller according to the equipment specification. If necessary, adjust, repair, or replace them.

SYMPTOM	CAUSE	SOLUTION
Insufficient output torque or draft force	Insufficient pressure built in the pump	<ul style="list-style-type: none"> Apply the full load on the motor and check the maximum pressure according to the equipment specification. If the measurement is excessively low, plug the lines A & B and measure the maximum pressure at the blocked line. If the measurement is still too low, adjust, repair, or replace the pump, pump adjuster, or system pressure relief valve as necessary.
	Excessive oil leakage from the motor and impossible to build full pressure	<ul style="list-style-type: none"> Apply the full load on the motor and check the maximum pressure according to the equipment specification. If the measurement is excessively low, plug the lines A & B and measure the maximum pressure at the blocked line. If the measurement is proper, remove and inspect the motor. Replace any faulty part. If necessary, replace the whole motor.
	Insufficient break-in of the motor	<ul style="list-style-type: none"> Operate the motor for 24-48 hours continuously (under load) to achieve its maximum efficiency. If the output torque increases continuously, this symptom may appear during this period.
	2-Speed spool partially or fully moved unintentionally due to high 2-speed shift pressure (if equipped)	<ul style="list-style-type: none"> If the spool does not move properly according to the equipment specification, check the 2-speed shift pressure. If the pressure is excessively high, adjust, repair, or replace the control valve. If necessary, check if the line is clogged.
	2-Speed spool partially or fully moved and stuck in place (if equipped)	<ul style="list-style-type: none"> Remove the 2-speed valve and check all the components, including the bore of the motor housing. Remove any foreign material. If necessary, replace any necessary component or the motor housing.
	Brake not released fully, due to excessively low brake release pressure (if equipped)	<ul style="list-style-type: none"> Check the brake release pressure according to the equipment specification. If necessary, adjust, repair, or replace the source of the pressure. If the source of the pressure is normal, remove the brake and replace the brake seal as necessary.
	Internal damage to the motor	<ul style="list-style-type: none"> Apply the full load on the motor and check the maximum pressure according to the equipment specification. If the measured pressure is normal and there is no apparent defect, other than the one described above, remove and check the motor. Replace any defective part. If necessary, replace the whole motor.

SYMPTOM	CAUSE	SOLUTION
Expected output speed cannot be achieved.	Insufficient hydraulic flow built in the pump	<ul style="list-style-type: none"> Check the engine speed and pump flow. If necessary, adjust, repair, or replace the engine or pump.
	Excessive oil leakage from the motor	<ul style="list-style-type: none"> Remove and check the motor. Replace any defective part. If necessary, replace the whole motor.
	2-Speed pool partially moved or not moved at all sometimes due to low 2-speed shift pressure (if equipped)	<ul style="list-style-type: none"> If the spool moves properly according to the equipment specification, check the 2-speed shift pressure. If the pressure is excessively low, adjust, repair, or replace the external control valve for 2-speed operation. If necessary, check if the line is clogged.
	2-Speed spool partially moved or stuck in the original place (if equipped)	<ul style="list-style-type: none"> Remove the 2-speed valve and check all of the components, including the bore of the motor housing. Remove any foreign material. If necessary, replace any necessary component or the motor housing.
The motor does not rotate.	The motor torque is achieved, but the load exceeds the motor torque.	<ul style="list-style-type: none"> Check the system pressure. If the pressure is increased up to the relief valve setting value, reduce the load applied on the motor.
	The expected motor torque is not achieved, and the load exceeds the motor torque.	<ul style="list-style-type: none"> Refer to the instructions for "Insufficient output torque or draft force" in the troubleshooting section.
	No oil supplied to the motor	<ul style="list-style-type: none"> Check the engine speed, pump oil flow, and control valve operation. If necessary, adjust, repair, or replace the engine, pump, or valve.
	Impossible to release the brake	<ul style="list-style-type: none"> Refer to the instructions for "Impossible to release the brake" in the troubleshooting section.
The motor rotates in the incorrect direction.	Incorrectly connected oil feed connection for the motor	<ul style="list-style-type: none"> Connect the oil feed connection correctly.
The hydraulic oil temperature is excessively high.	Overheated motor	<ul style="list-style-type: none"> Check the cooling system and flushing valve.
	Malfunctioning pressure control valve (example: relief valve and pressure controller)	<ul style="list-style-type: none"> Check the corresponding component, and then repair or replace it as necessary.
	Excessively high output speed	<ul style="list-style-type: none"> Check the motor speed according to the equipment specification. If the speed is excessively high, reset the pump and/or engine speed.
	Flushing valve closed due to excessive high motor case discharge pressure	<ul style="list-style-type: none"> Check the case pressure according to the equipment specification. If the pressure is excessively high, check if the drain line is clogged.

SYMPTOM	CAUSE	SOLUTION
External oil leakage	Damaged external seal (example: shaft/cam/brake seal)	<ul style="list-style-type: none"> Check the oil cleanliness and motor pressure. In addition, check to ensure that no discharge line is clogged and that the discharge pressure is within the equipment specification. Remove the motor and check any suspicious seal for leakage. If the shaft seal is damaged, check the bearing. If necessary, replace the part.
	Loose bolt	<ul style="list-style-type: none"> Check that all the bolts are properly tightened to the torque setting value.
	Loose connection	<ul style="list-style-type: none"> Check that all the connections are tightened to the specified torque setting values.
Insufficient braking torque	Excessive pressure of the brake release chamber (disc brake)	<ul style="list-style-type: none"> Check that the brake pressure is applied according to the equipment specification. If the pressure is too high, check the control valve and drain line for the tank. If necessary, repair/replace it or remove clogging materials.
	Brake released partially due to excessively high motor case drain pressure (disc brake)	<ul style="list-style-type: none"> Check the case pressure according to the equipment specification. If the pressure is excessively high, check if the drain line is clogged.
	Worn brake lining or disc	<ul style="list-style-type: none"> If necessary, replace the brake shoe or brake disc. If the parking brake (disc brake) is worn, find its cause. The brake should neither be used actively nor worn out.
	Anti-seize compound/anti-slip compound mixed in hydraulic oil (disc brake)	<ul style="list-style-type: none"> Drain and flush the system and replenish it with hydraulic oil without any additive. Remove all of the motor components, wash them thoroughly, and replace all of the brake discs with new ones.
	Insufficient brake operating pressure (service brake)	<ul style="list-style-type: none"> Check if the pressure is proper according to the equipment specification. In addition, check the source of the pressure. When necessary, repair or replace the component.

SYMPTOM	CAUSE	SOLUTION
Impossible to release the brake	Excessively low brake release pressure (disc brake)	<ul style="list-style-type: none"> Check the brake release pressure according to the equipment specification. If necessary, adjust, repair, or replace the source of the pressure. If the source of the pressure is normal, remove the brake and replace the brake seal as necessary.
	Damaged brake piston or seal (disc brake)	<ul style="list-style-type: none"> When necessary, replace the brake piston or seal.
	Deposited brake plate (disc brake)	<ul style="list-style-type: none"> Remove and inspect the brake. If necessary, replace the part. If it is deposited, find the cause. The parking brake should never be used as a service brake.
The 2-speed adjuster is malfunctioning (if equipped).	Incorrect 2-speed adjusting pressure	<ul style="list-style-type: none"> Check the adjusting pressure when moved and not moved according to the equipment specification. Check the adjusting components, and repair or replace them as necessary.
	Damaged 2-speed valve	<ul style="list-style-type: none"> Remove the 2-speed valve and check all of the components, including the bore of the motor housing. Remove any foreign material. If necessary, replace any necessary component or the motor housing.
	2-Speed valve partially moved or not moved at all due to excessively high motor case drain pressure	<ul style="list-style-type: none"> Check the case pressure according to the equipment specification. If the pressure is excessively high, check if the drain line is clogged.

4.2 CONTROL SYSTEM

SYMPTOM	CAUSE	SOLUTION
The control lever is not in the neutral (center) position.	Defective linkage control device	• Adjust it again.
	Disconnected linkage	• Adjust it again. Check for worn rod end or loose nut.
	Damaged center (neutral) spring	• Replace it.
	Linkage stuck due to interference	• Fit the spring bushing into the housing and align the housing and linkage in a line.
	Control lever interfered with the cover or sound insulator	• Check for interference.
The equipment malfunctions.	Loose adjustment linkage	• Check if the ball joint section of the linkage is worn. In addition, tighten the lock nut firmly.
	Linkage out of position	• Tighten it.
	Leakage from the control pump	• Inspect and repair the defective part. Clean the tank and hydraulic line and replace the filter. Check the engine RPM and operating oil specification.
The control lever won't return to the neutral position.	Stuck control lever or linkage	• Check and clean or replace it.
	Malfunctioning spool centering spring of the control valve	• Check and repair it as necessary.
The control lever cannot be operated smoothly, but it is rather moved with steps.	Worn or damaged control lever linkage	• Check and repair it as necessary.
	Malfunctioning control valve	• Check and repair it as necessary.
When the seat bar is raised, the wheels are not locked.	Improperly adjusted wheel pin lock	• Adjust it again.
The equipment does not stop properly when parking it.	Defective driving motor parking solenoid valve	• Check and replace it as necessary.
	Worn or defective driving motor parking disc	• Check any damaged part and replace it as necessary.
	Defective charge pump	• Check any damaged part and replace it as necessary.

5. EXPLODED VIEW



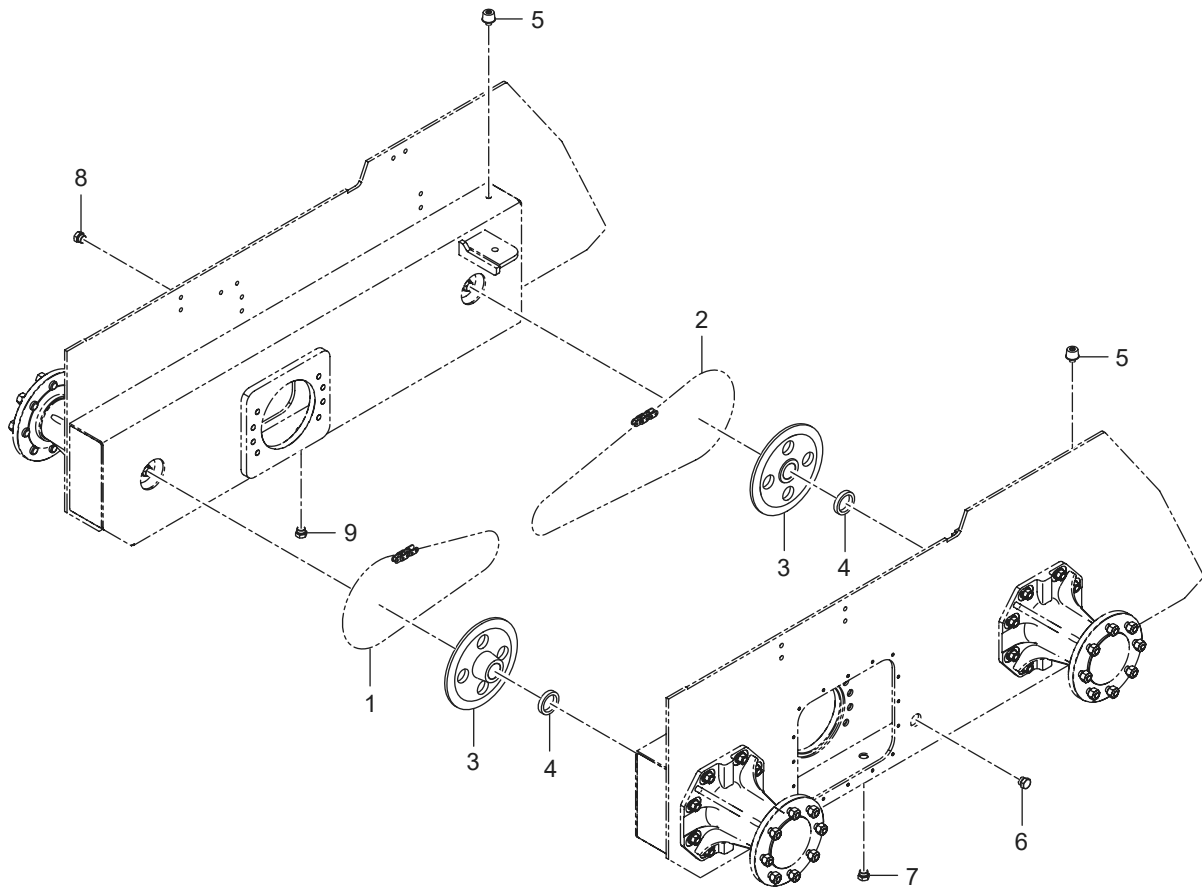
REMARKS

- The manufacturing parts are subject to change without notice. Therefore, check the parts catalog or electronic manual for latest information.

5.1 LF1-G111003 DRIVE CHAIN GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W391A

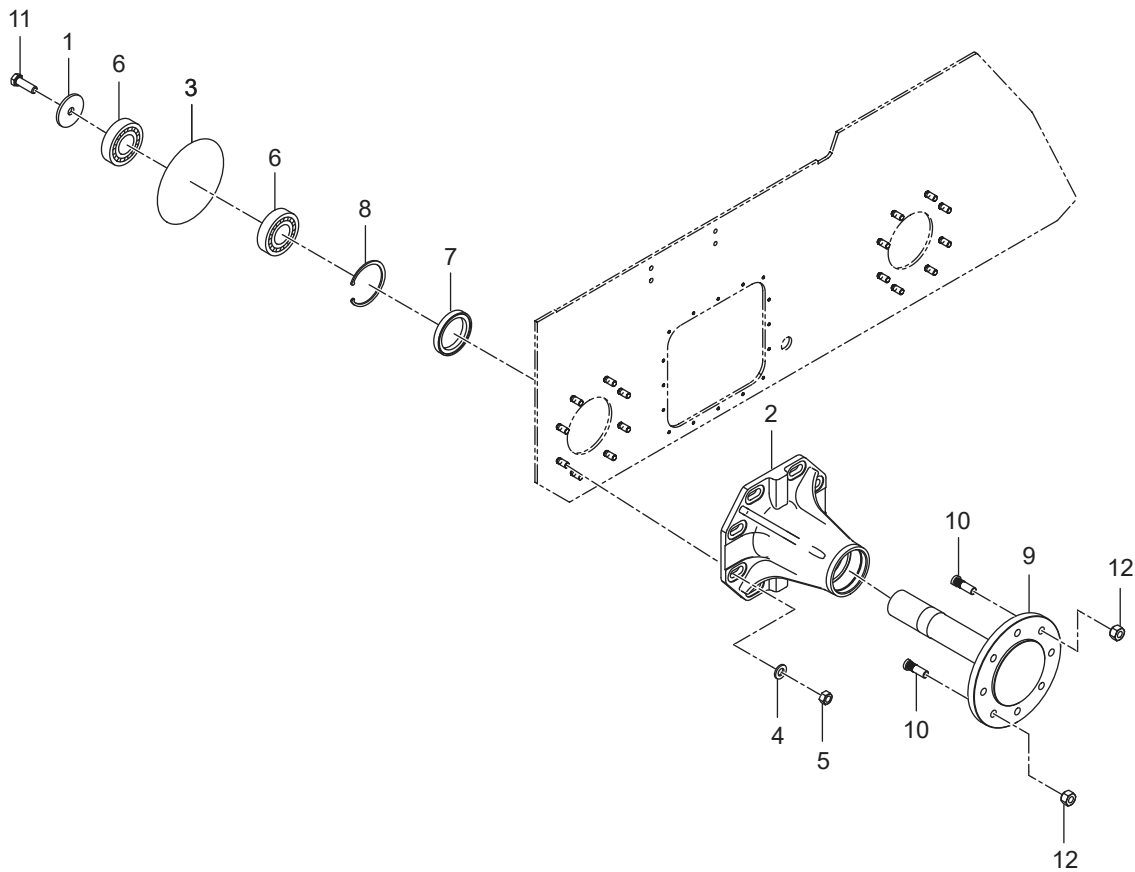
COMPONENTS

- | | | |
|-----------------|------------------|----------|
| (1) Chain-52 | (4) Spacer | (7) Plug |
| (2) Chain-66 | (5) Air Breather | (8) Plug |
| (3) Sprocket-30 | (6) Plug | (9) Plug |

5.2 LF1-G112003 AXLE GROUP

* HS80V : Refer to parts manual.

HS120V

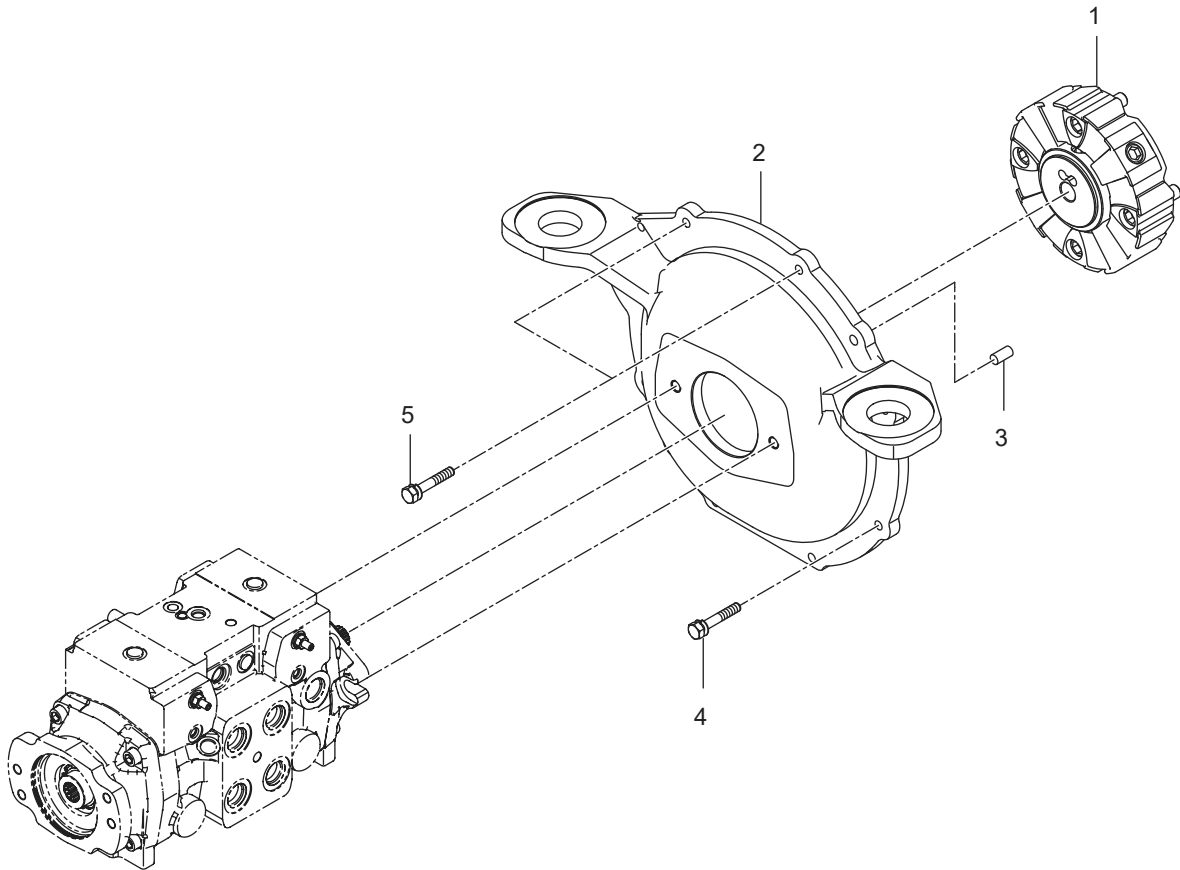


LF1W392A

COMPONENTS

- | | | |
|----------------|---------------------------|--------------------|
| (1) Collar | (5) Nut | (9) Axle |
| (2) Case, Axle | (6) Bearing, Taper Roller | (10) Bolt, Axle |
| (3) O Ring | (7) Oil Seal | (11) Bolt, Hexagon |
| (4) Washer | (8) Snap Ring | (12) Nut, Wheel |

5.3 LF1-G121002 CLUTCH HOUSING GROUP



LF1W393A

COMPONENTS

- (1) Assy Coupling
- (2) Housing, Pump

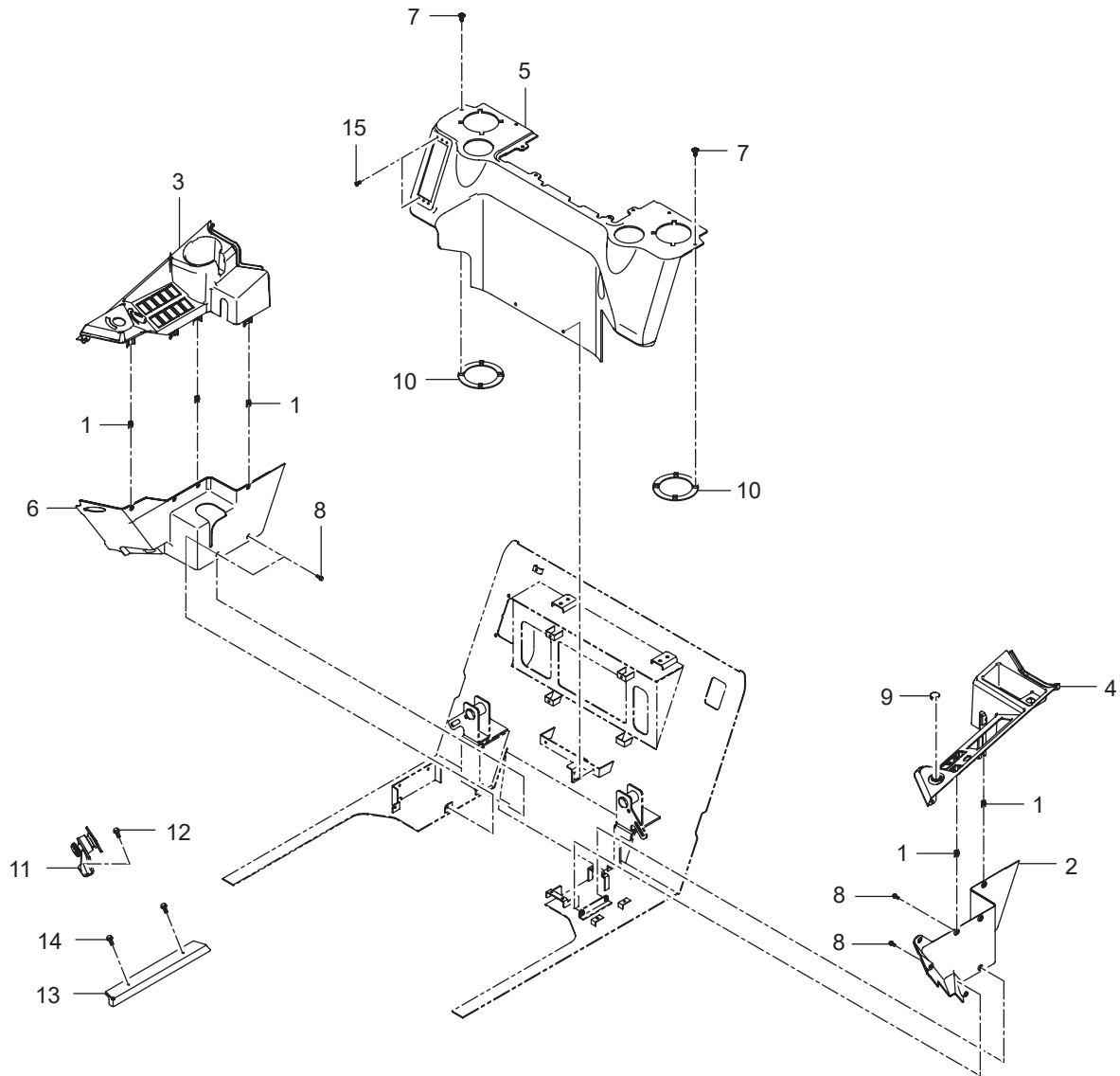
- (3) Pin, Dowel
- (4) With Washer Bolt

- (5) Bolt

5.4 LF1-G4D2001 LEVER GUIDE GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W394A

COMPONENTS

- | | | |
|-------------------------|-------------------------|-------------------------|
| (1) Nut, Spring | (6) Guide, Lever-RH LWR | (11) Bracket, Monitor |
| (2) Guide, Lever-LH LWR | (7) Rivet, Screw | (12) Bolt, With Washer |
| (3) Guide, Lever-RH UPR | (8) Bolt Flange | (13) Guide, Lever-RH FR |
| (4) Guide, Lever-LH UPR | (9) Cap-Auxcover | (14) Flange Bolt |
| (5) Hood-RR | (10) Bracket, Speaker | (15) Nut |

SAFETY FIRST

ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

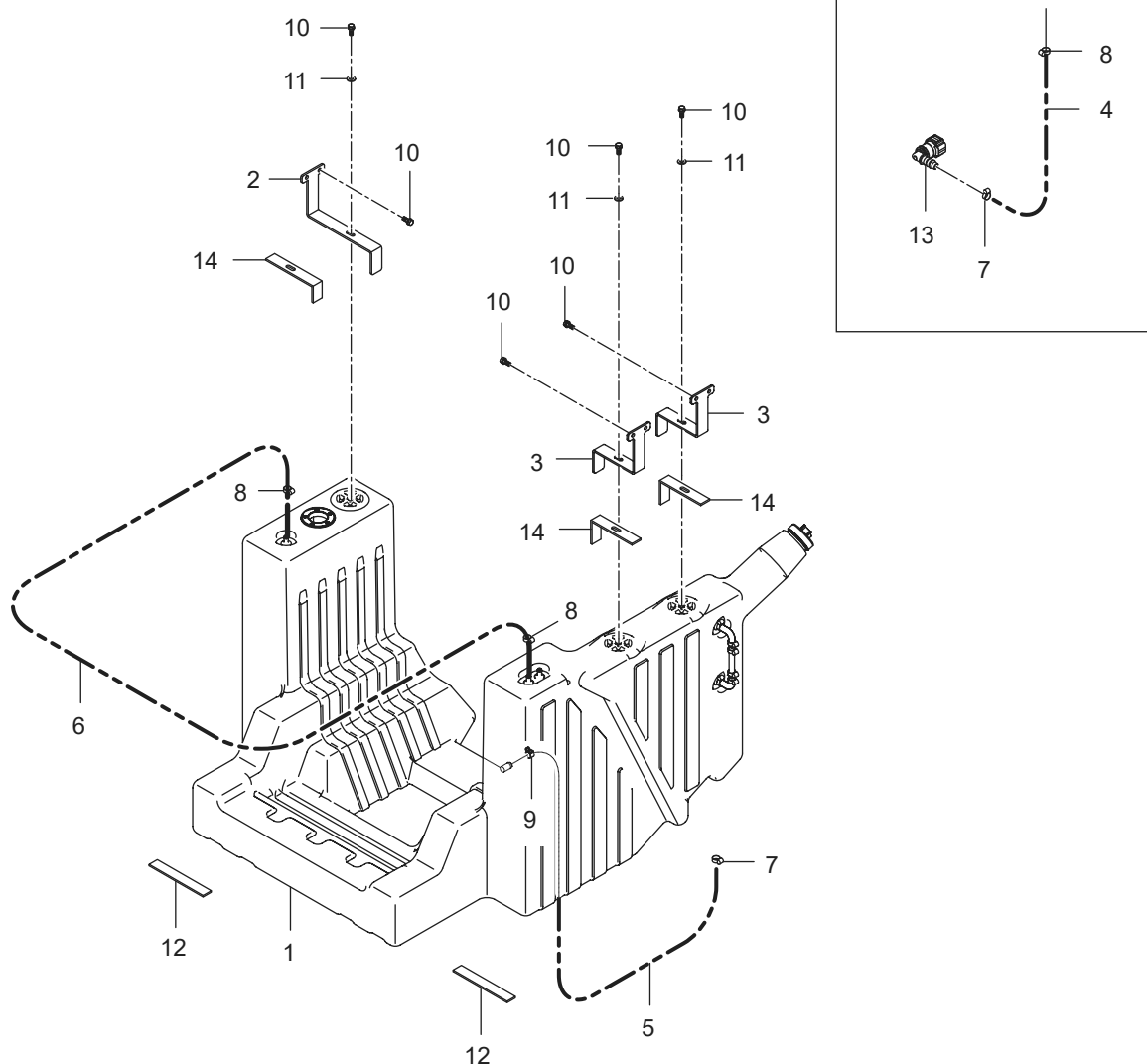
CABIN

INDEX

5.5 LF1-G431003 FUEL TANK GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W395A

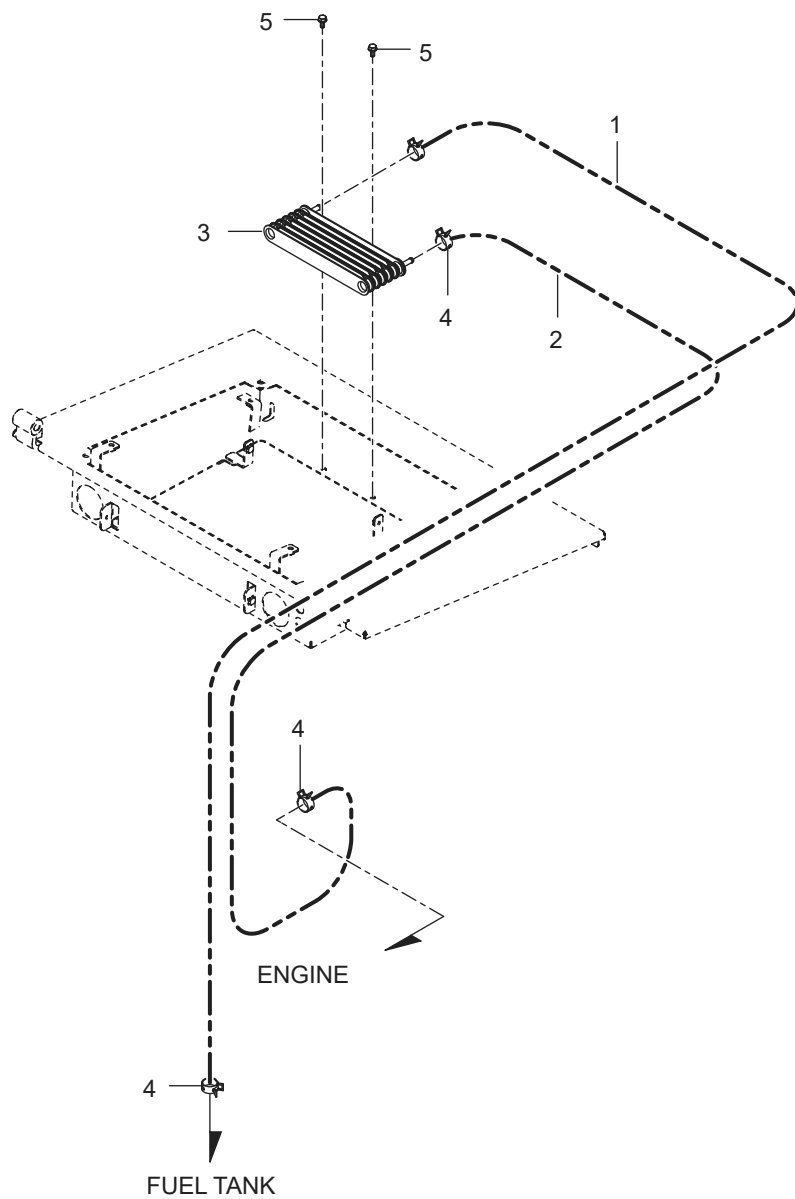
COMPONENTS

- | | | |
|--------------------------|------------------|----------------------|
| (1) Assy Tank, Fuel | (5) Hose, Fuel-2 | (9) Hose Clip |
| (2) Bracket, Fuel Tank 1 | (6) Hose, Fuel 5 | (10) Bolt, Washer |
| (3) Bracket, Fuel Tank 2 | (7) Clmap, Hose | (11) Plain Washer |
| (4) Hose, Fuel-1 | (8) Hose Clip | (12) Rubber, Cushion |

5.6 LF1-G432001 FUEL COOLER GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W396A

COMPONENTS

- (1) Hose, Fuel 3
- (2) Hose, Fuel 4

- (3) Fuel Cooler
- (4) Clmap, Hose

- (5) Hex Head Cap Screw

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ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

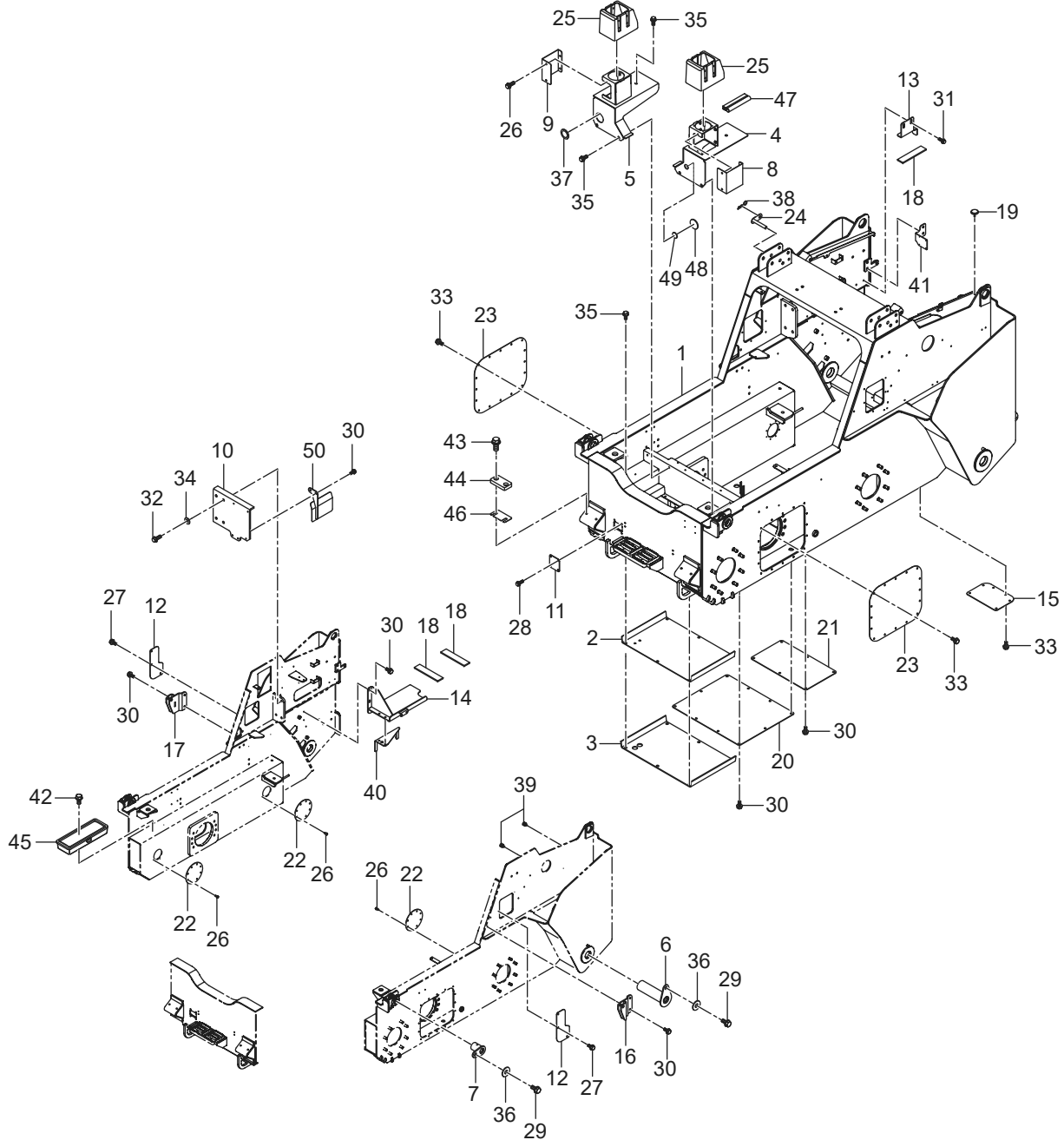
CABIN

INDEX

5.7 LF1-G461001 MAIN FRAME GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W397A

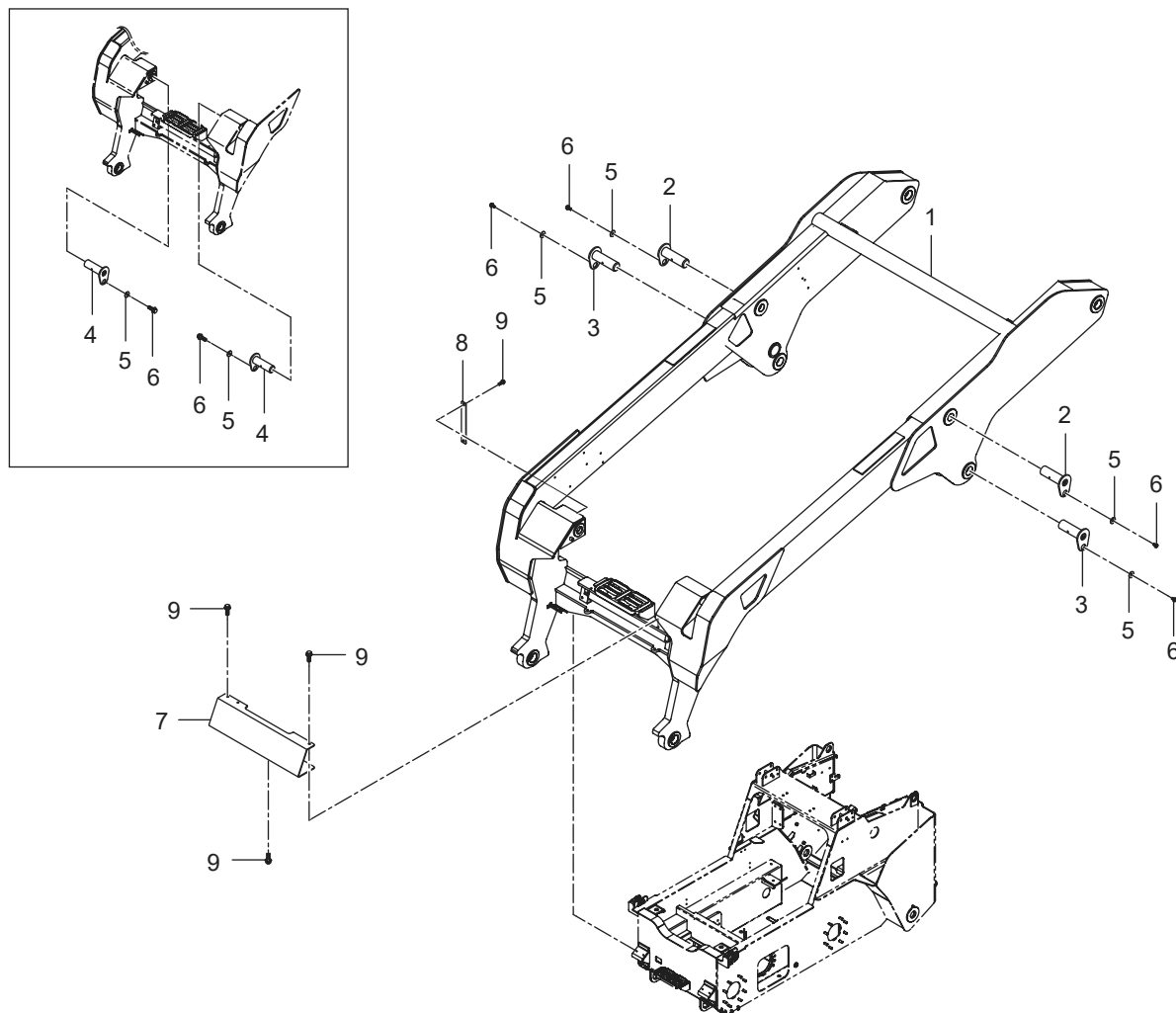
COMPONENTS

- | | | | |
|------------------------------|----------------------------|--------------------------------|-------------------------------|
| (1) Total Assy Frame, Main | (14) Bracket, Battery | (27) With Washer Bolt | (39) Rubber, Dustproof |
| (2) Floor 1 | (15) Window, Maintenance 4 | (28) Bolt, Washer | (40) Plate, Wire Harness |
| (3) Pad, Sealing 2 | (16) Bracket, Cyl RH | (29) Bolt | (41) Plate, Fixing |
| (4) Bracket, Joystick-LH | (17) Bracket, Cyl LH | (30) Hex Head Bolt With Washer | (42) With Washer Bolt |
| (5) Bracket, Joystick-RH | (18) Rubber, Cushion | (31) Bolt With Washer | (43) Bolt, Flange |
| (6) Pin, Link-Lwr | (19) Cushion | (32) Bolt | (44) Stopper |
| (7) Link Pin, Control-LWR | (20) Window, Maintenance 2 | (33) Flange Bolt | (45) Box, Tool |
| (8) Bracket, Joystick-UPR LH | (21) Window, Maintenance 3 | (34) Plain Washer | (46) Shim-1.0 |
| (9) Bracket, Joystick-UPR RH | (22) Window, Maintenance | (35) Bolt, With Washer | (47) Weatherstrip |
| (10) Bracket, Valve | (23) Chain, Cover | (36) Plain Washer, M10 | (48) Sound Absorber |
| (11) Window, Maintenance | (24) Assy Pin | (37) Pad, Sealing | (49) Sound Absorber-2 |
| (12) Window, Maintenance 1 | (25) Cover, Joystick-LH | (38) Pin, Snap | (50) Assy Plate, Interception |
| (13) Bracket, Battery | (26) Bolt, Flange | | |

5.8 LF1-G462001 BOOM FRAME GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W398A

COMPONENTS

- | | | |
|---------------------------|----------------------------|-------------------------------|
| (1) Assy Boom | (4) Pin, Tilt Cylinder-UPR | (7) Plate |
| (2) Pin, Lift Cylinder | (5) Plain Washer, M10 | (8) Plate, Holder |
| (3) Link Pin, Control-UPR | (6) Bolt | (9) Hex Head Bolt With Washer |

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ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

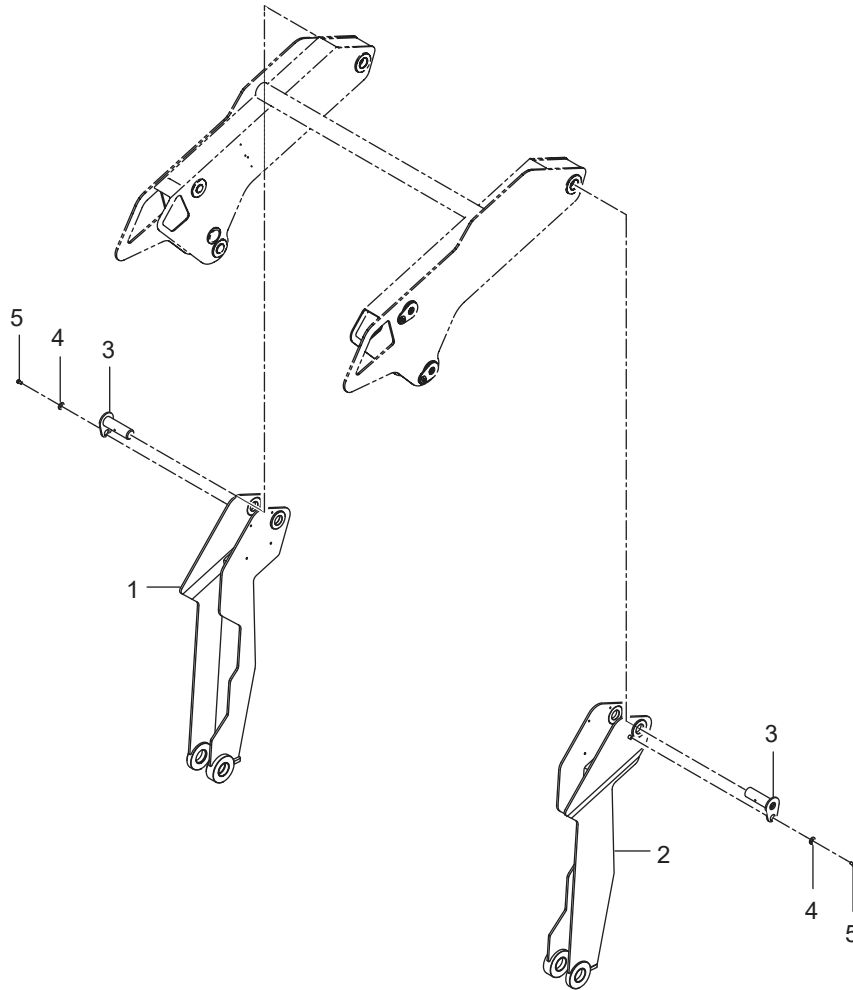
CABIN

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5.9 LF1-G463001 ROTATION FRAME GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W399A

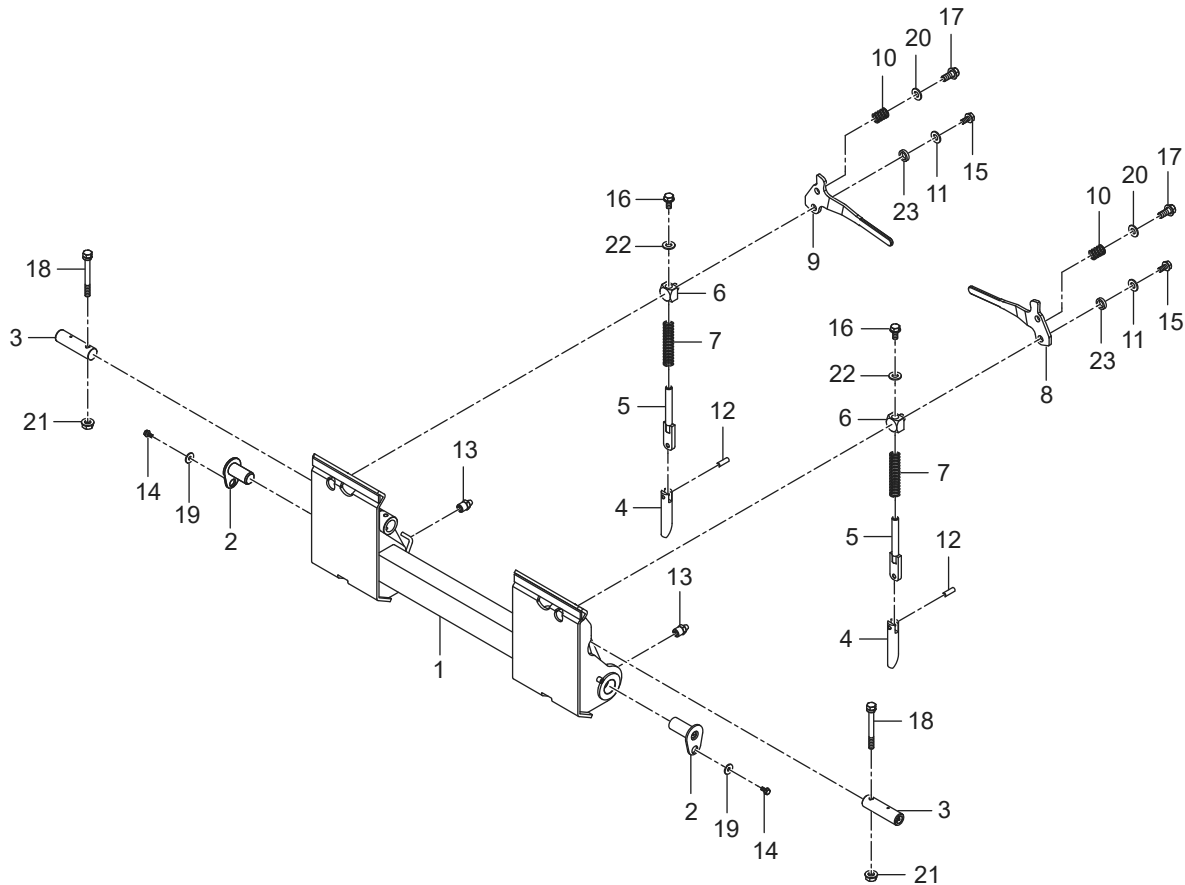
COMPONENTS

- | | | |
|----------------------|-----------------------|----------|
| (1) Link Rotating-RH | (3) Pin, Link-UPR | (5) Bolt |
| (2) Link Rotating-LH | (4) Plain Washer, M10 | |

5.10 LF1-G465001 QUICK ATTACH GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W3A01A

COMPONENTS

- | | | |
|----------------------------|--------------------------------|------------------------|
| (1) Assy Attach, Quick | (9) Lever-RH | (17) Bolt, Washer |
| (2) Pin, Quick Attach-LWR | (10) Spring | (18) Bolt, Washer |
| (3) Pin, Tilt Cylinder-LWR | (11) Plain Washer | (19) Plain Washer, M10 |
| (4) Wedge | (12) Lock Pin | (20) Plain Washer |
| (5) Boss 7 | (13) Nipple, Grease | (21) Nut, Lock |
| (6) Boss 6 | (14) With Washer Bolt | (22) Washer, Plain |
| (7) Spring 2 | (15) With Washer Bolt | (23) Collar |
| (8) Lever | (16) Hex Head Bolt With Washer | |

SAFETY FIRST

ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

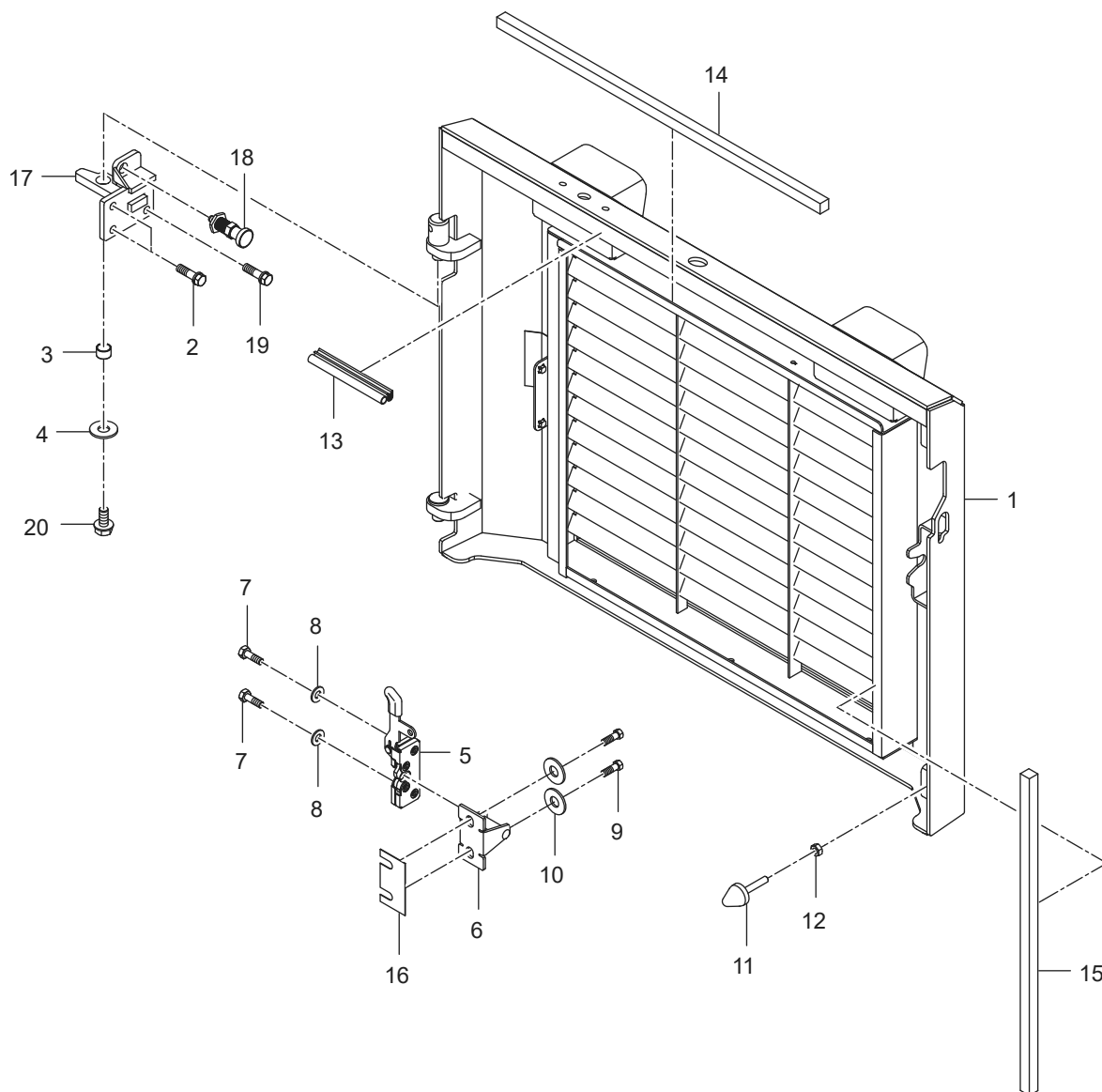
CABIN

INDEX

5.11 LF1-G472001 REAR DOOR GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W3A02A

COMPONENTS

- | | | |
|-------------------------------|------------------------------|--------------------------------|
| (1) Assy Door-RR | (8) Washer, Plain | (15) Pad, Sealing 2 |
| (2) Hex Head Bolt With Washer | (9) Hex Head Bolt, 10mmx30mm | (16) Shim 1.0 |
| (3) Bush | (10) Plain Washer, M10 | (17) Bracket |
| (4) Plain Washer, M10 | (11) Rubber, Damper | (18) Pin, Fixing |
| (5) Latch-RR | (12) Nut | (19) Washer Bolt |
| (6) Striker, Latch | (13) Weatherstrip | (20) Hex Head Bolt With Washer |
| (7) Bolt Washer | (14) Pad, Sealing 1 | |

6. MAINTENANCE

6.1 AXLE CASE DISASSEMBLY, ASSEMBLY

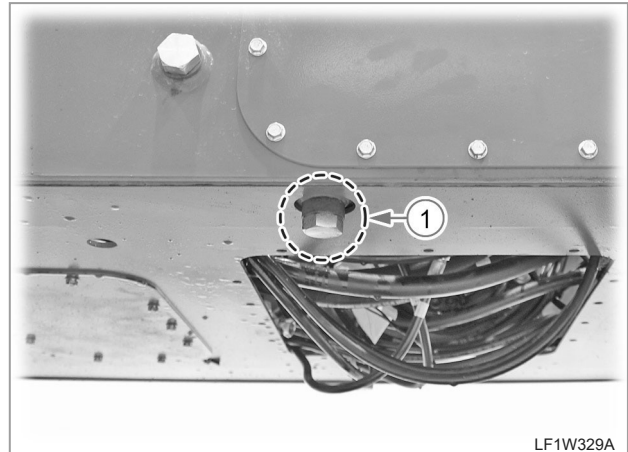
1. Park the vehicle on a flat surface, lower the loader bucket onto the ground, turn off the engine, and then apply the parking brake.



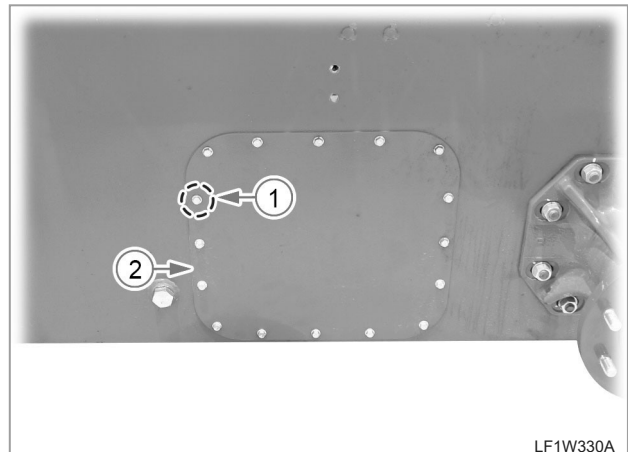
2. Open the cabin.



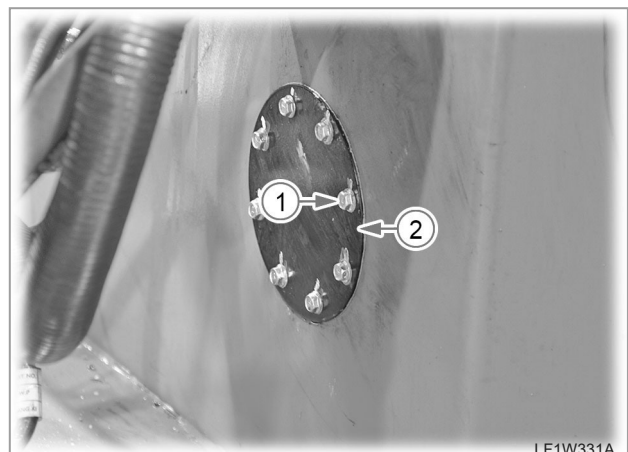
3. Lift the vehicle off the ground. Then, remove the wheels on the side that the HST motor will be removed from.



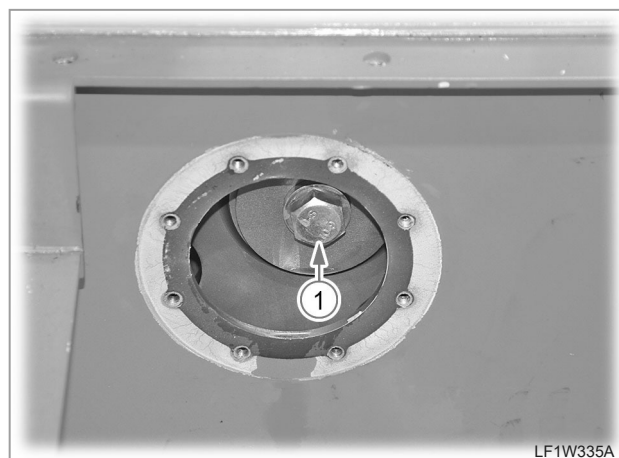
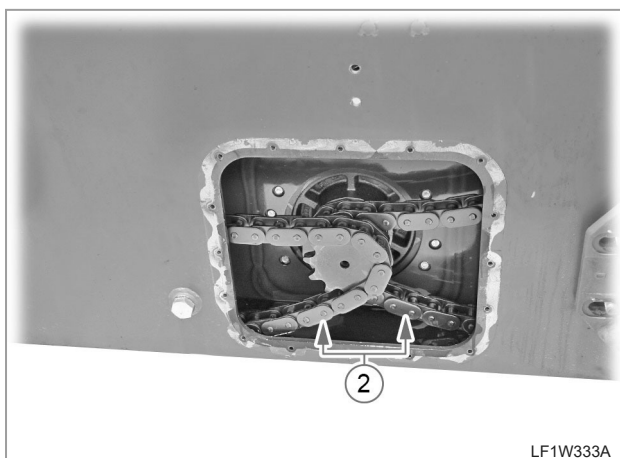
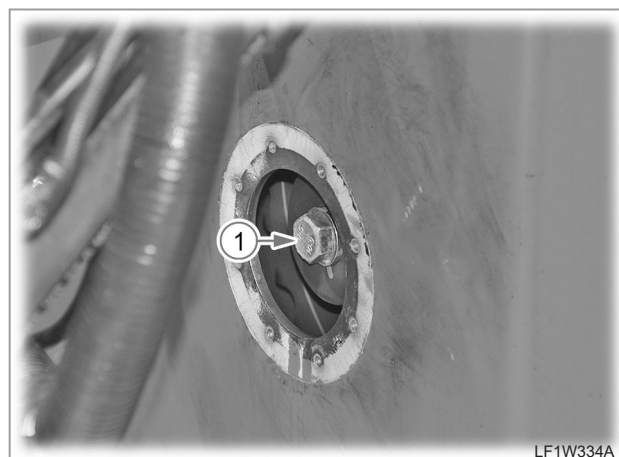
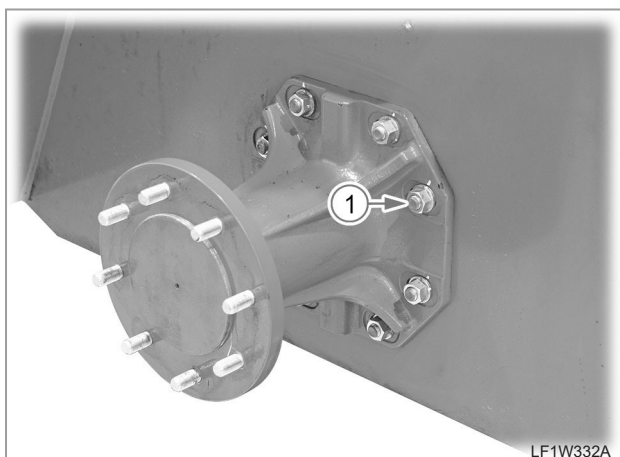
4. Unscrew the plug (1) on the bottom of the main frame, and then drain the axle chain box gear oil.



5. Unscrew the cover mounting bolts (1)(16EA) on the outside of the main frame, and then remove the cover (2).



6. Unscrew the mounting bolts (1)(8EA) on the inside of the main frame rear section, and then remove the cover (2).



7. Unscrew the front/rear axle case mounting nuts (1)(8EA), and then loosen the drive chains (2). During reassembly, apply liquid gasket (Three Bond 1206D or equivalent) on the mating surfaces, and tighten the mounting nuts to the specified torque sequentially in a diagonal order.

Mounting nut(M16)

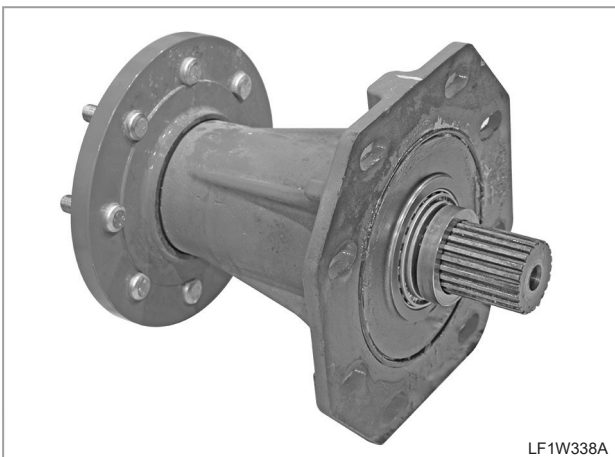
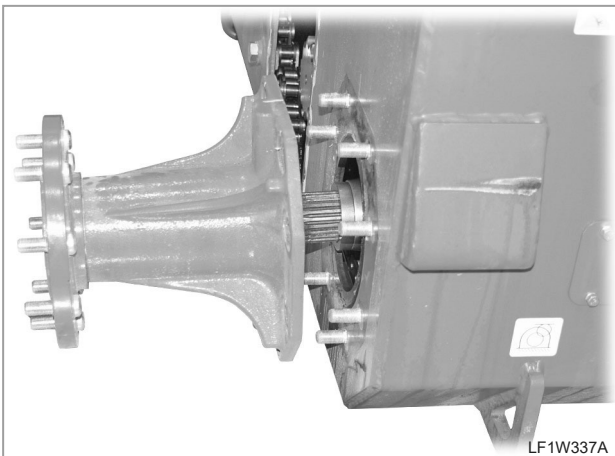
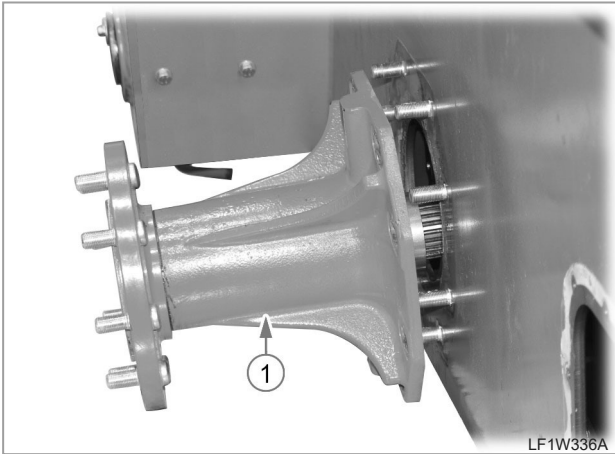
tightening torque..... 30.8 ~ 34.0 kgf-m

8. Unscrew the sprocket mounting bolt (1) from the inside of the main frame.

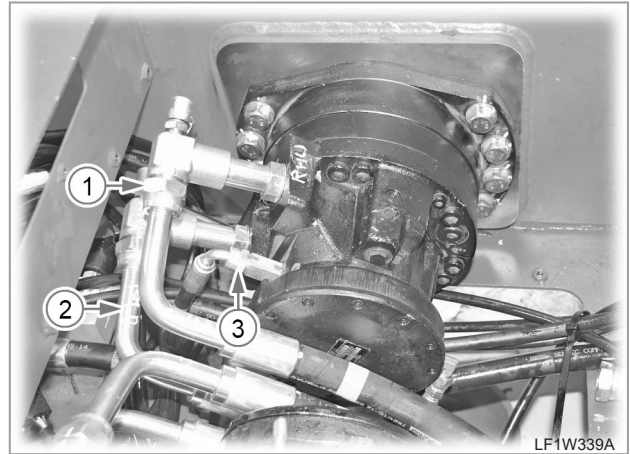
When reinstalling the mounting bolt, apply the sealant (LOCTITE 271 or equivalent) on its threads and tighten it to the specified torque.

Mounting nut(M16)

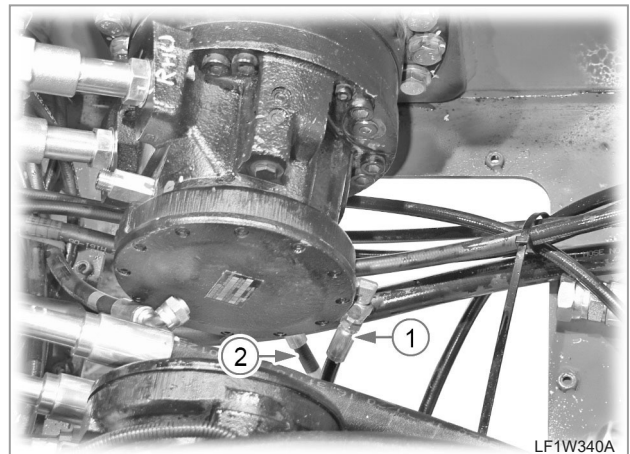
tightening torque..... 30.8 ~ 34.0 kgf-m



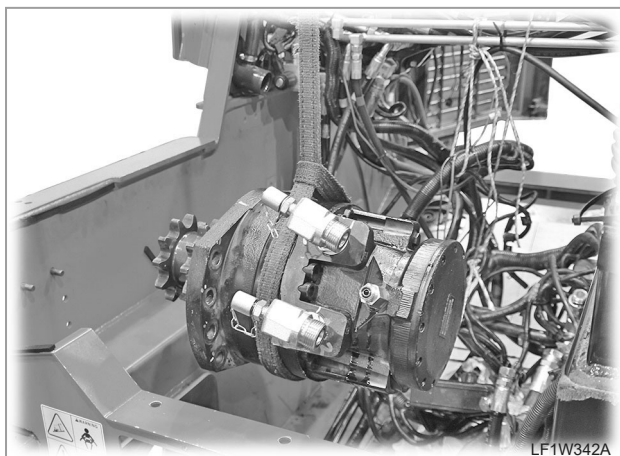
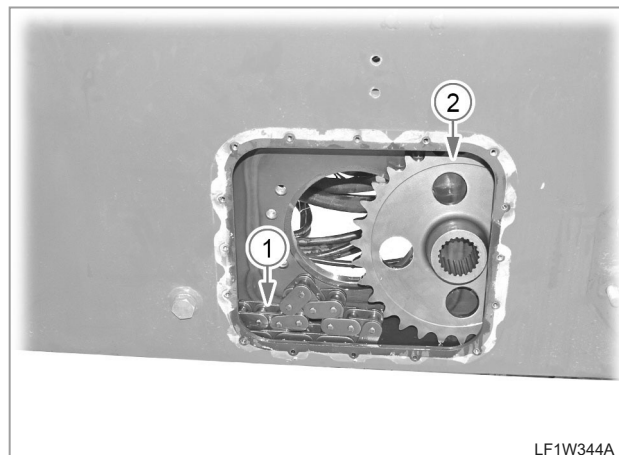
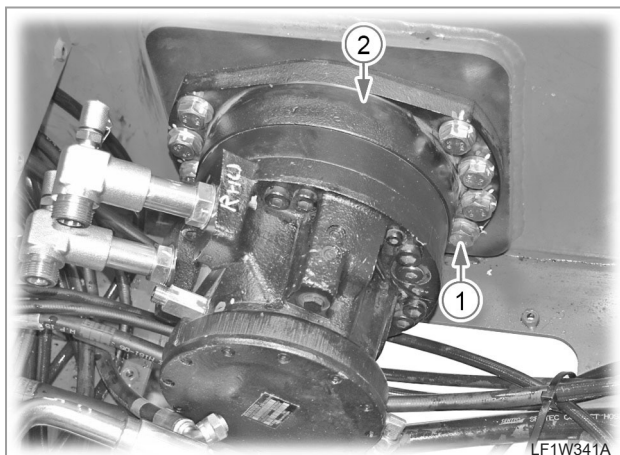
9. Remove the axle case (1).



10. Disconnect the hydraulic hoses (forward driving: 1, reverse driving: 2, tank return: 3) from the upper side of the right-hand HST motor.



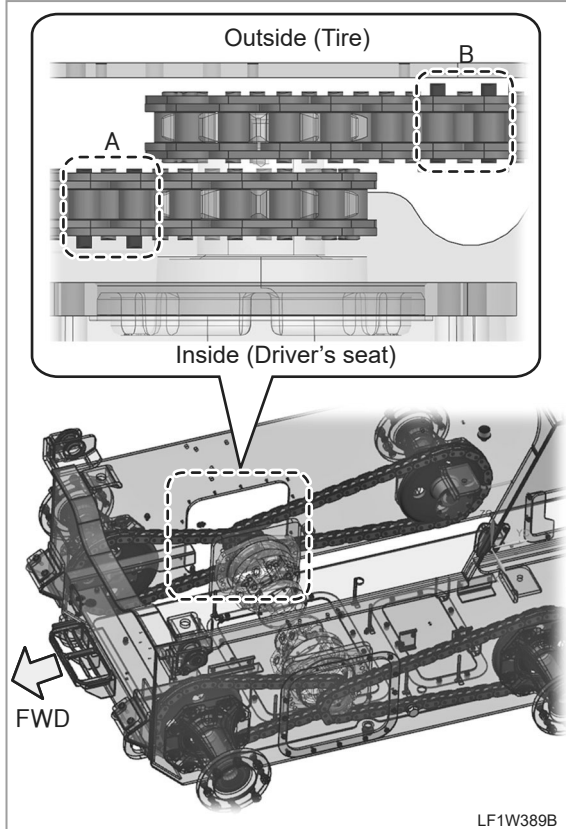
11. Disconnect the hydraulic hoses (parking valve: 1, soft shift valve: 2) from the lower side of the right-hand HST motor.



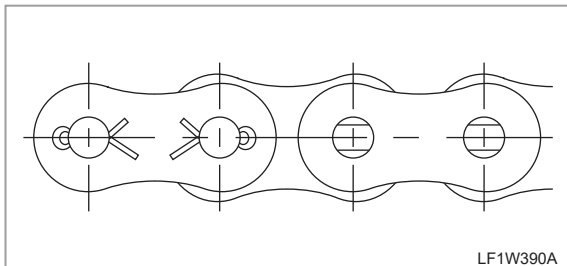
12. Unscrew the HST motor mounting bolts (1)(8EA) to remove the HST motor (2) from the inside of the main frame.

13. Pull out the drive chains (1) and sprockets (2) from the main frame.

CAUTION

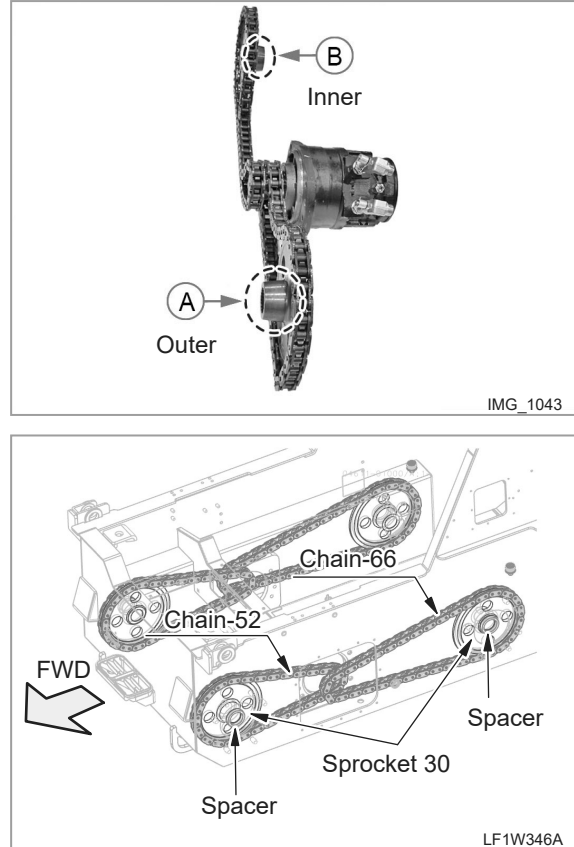


- When installing the drive chain, check the direction of the connecting link and install it using a jig as shown in the figure.
- Chain-52 (A Section) : The split pin direction should face inward.
- Chain-66 (B Section) : The split pin direction should face outward.



- When installing the drive chain connecting link, make sure to install the split pin in the correct direction. (Refer to the figure)

CAUTION



- When installing the sprockets, ensure that the front (A) and rear (B) boss sections are facing the correct direction.
- Refer to "1.5.1 Drive chain tension adjustment" for chain tension adjustment.

6.2 AXLE DISASSEMBLY

SAFETY FIRST

ENGINE

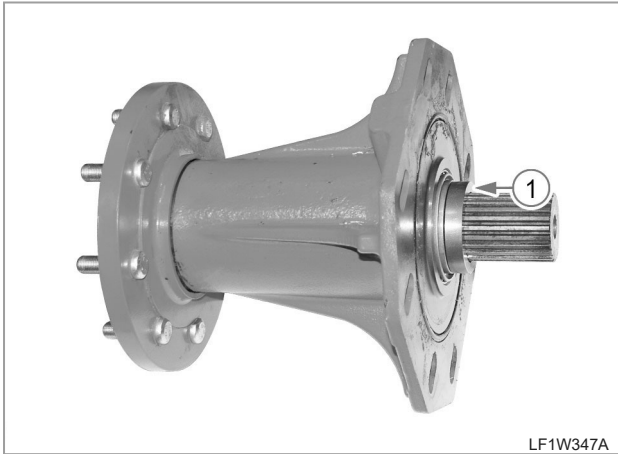
DRIVING & CHASSIS

HYDRAULIC SYSTEM

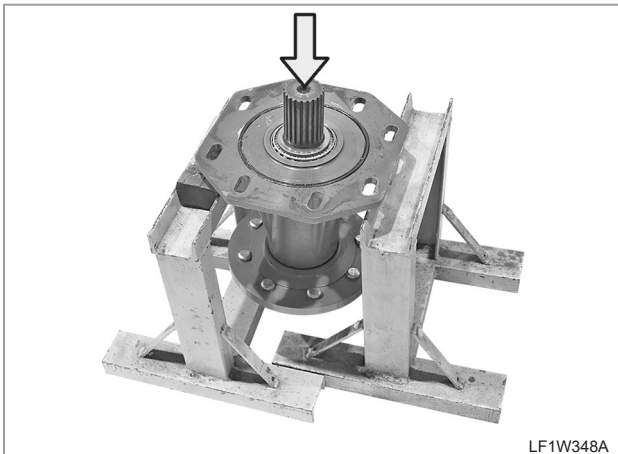
ELECTRIC SYSTEM

CABIN

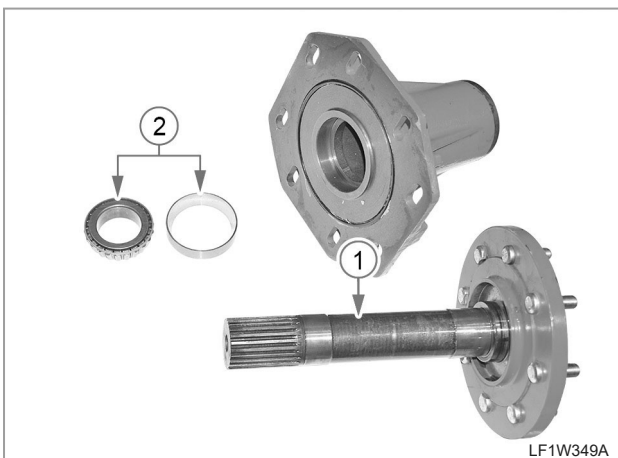
INDEX



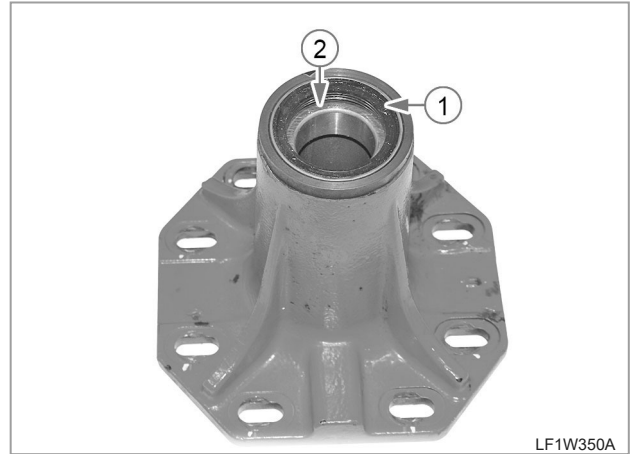
1. Remove the axle spacer (1) on the front of the axle case assembly.



2. Support the axle case assembly off the ground as shown in the figure, and then tap the axle with a plastic hammer.

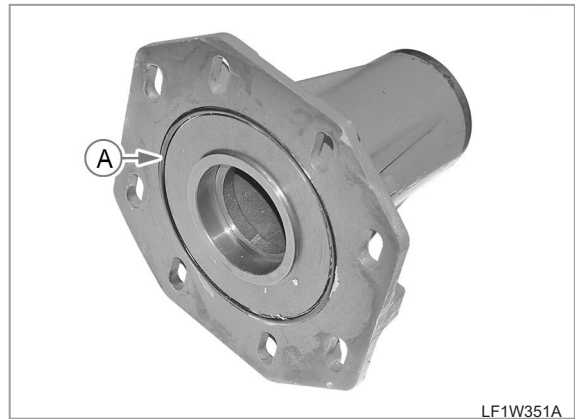


3. Remove the axle (1) and tapered roller inner bearings (2).



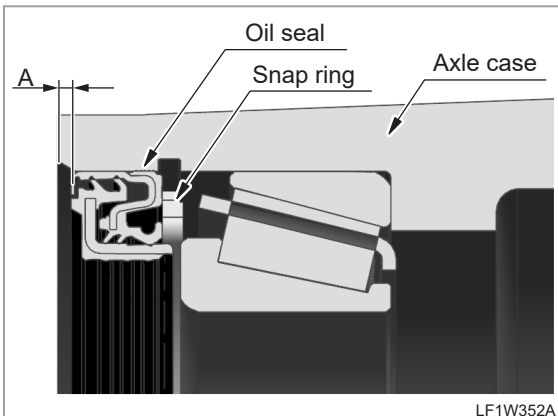
4. Remove the oil seal (1) and tapered roller outer bearings (2) from the opposite side of the axle case.

! IMPOARTANT



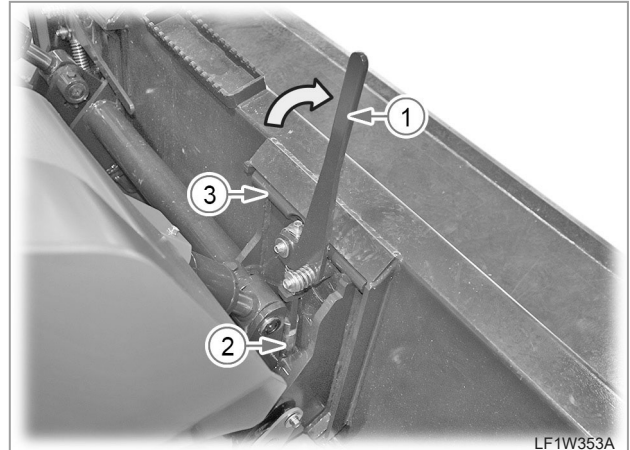
- Check if the axle case O-ring (A) is damaged. If damaged, replace it with a new one and apply liquid gasket around the O-ring.

CAUTION

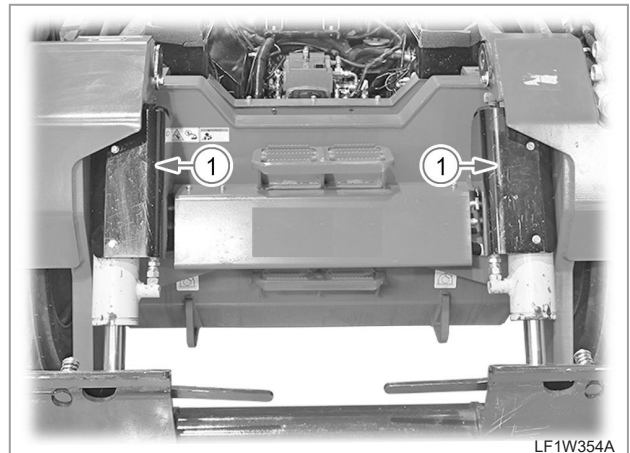


- When removing the oil seal, replace it with a new one and use a tool not to damage it during installation. In addition, ensure its correct installation direction.
- Distance setting between the axle case and oil seal (A): 1.5-1.7 mm

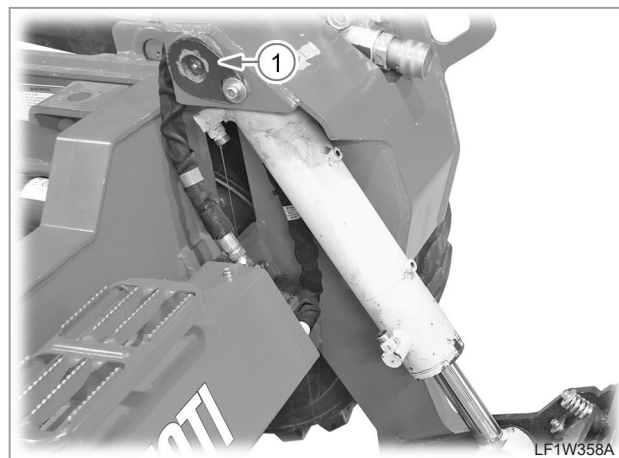
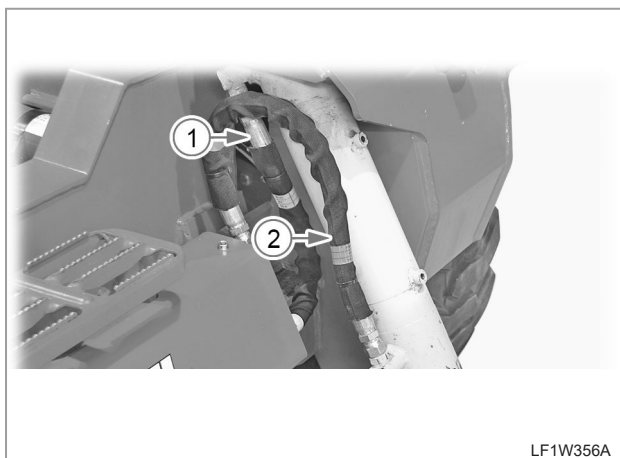
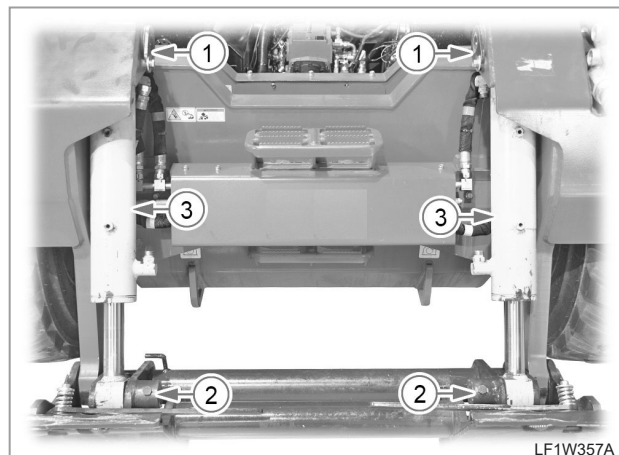
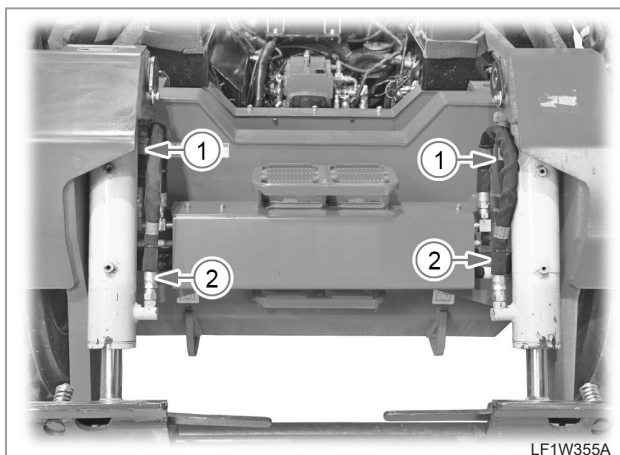
6.3 IMPLEMENT HOLDER (QUICK COUPLER) DISASSEMBLY



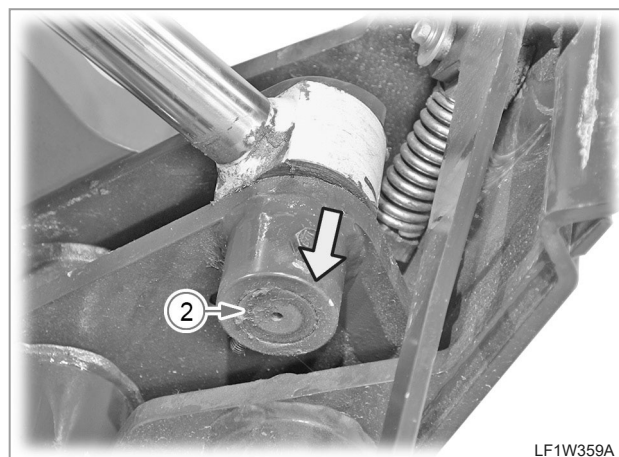
1. Pull up of the hand lever (1) of the attachment holder, and then check that the lock pin (2) is off the bucket slot.
2. Tilt the attachment holder forward and drive the vehicle backwards until the upper connection (3) of the holder comes off the bottom of the bucket top lip in order to remove the bucket.



3. Remove the tilt cylinder covers (1).

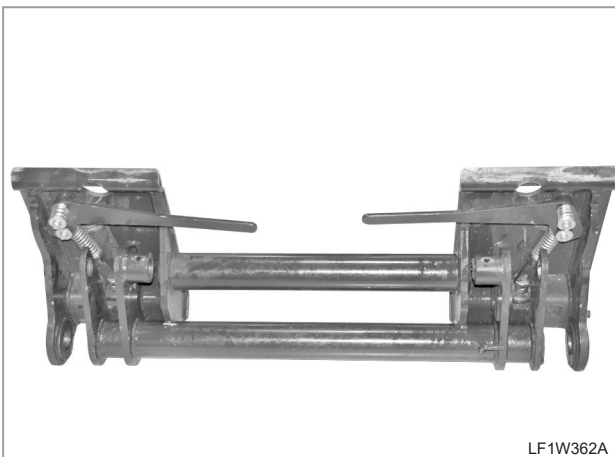
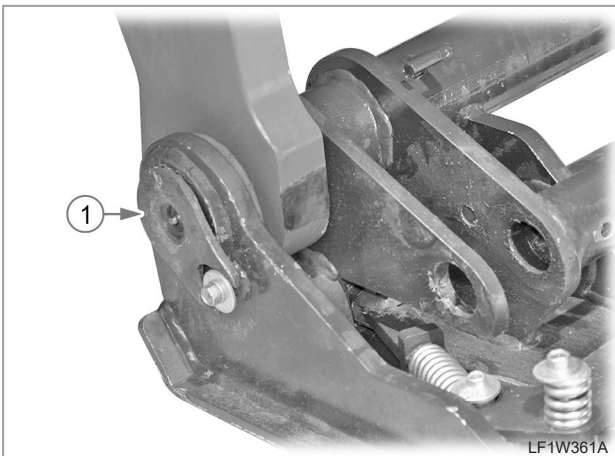
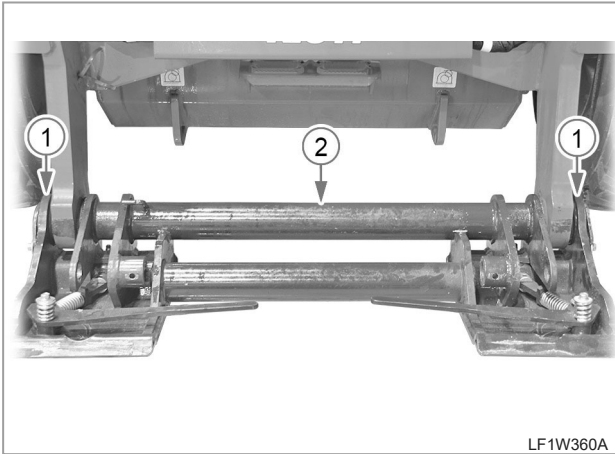


4. Disconnect the tilt cylinder hydraulic hoses (1 & 2).

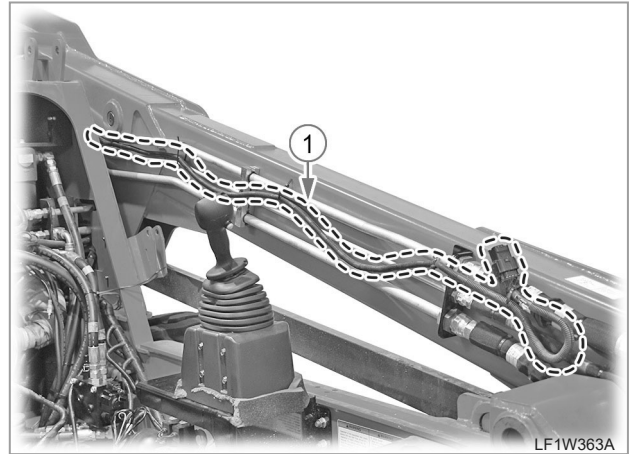


5. Remove the tilt cylinder retaining pins (1 & 2) through the inside in order to remove the tilt cylinders (3).

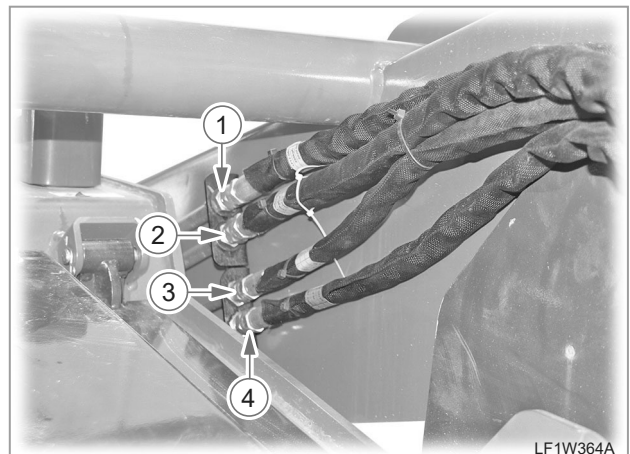
6.4 BOOM DISASSEMBLY



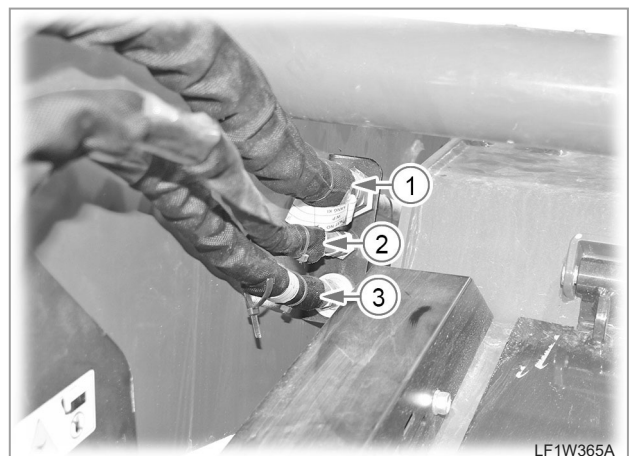
6. Pull out the bucket quick coupler retaining pins (1)(2EA). Then, remove the quick coupler (2).



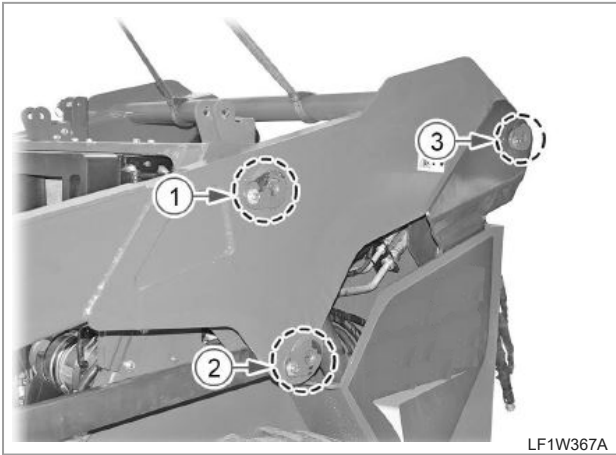
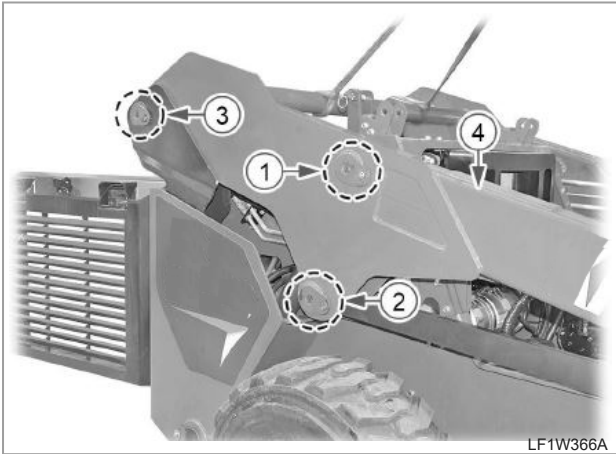
1. Disconnect the wiring (1) from the boom assembly.



2. Disconnect the hydraulic hoses (1, 2, 3 (brown) & 4 (green)) from the right rear side of the boom assembly.



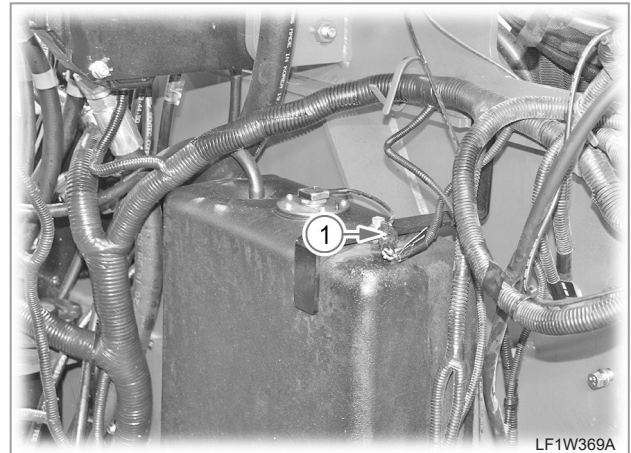
3. Disconnect the hydraulic hoses (1, 2 & 3 (brown)) from the left rear side of the boom assembly.



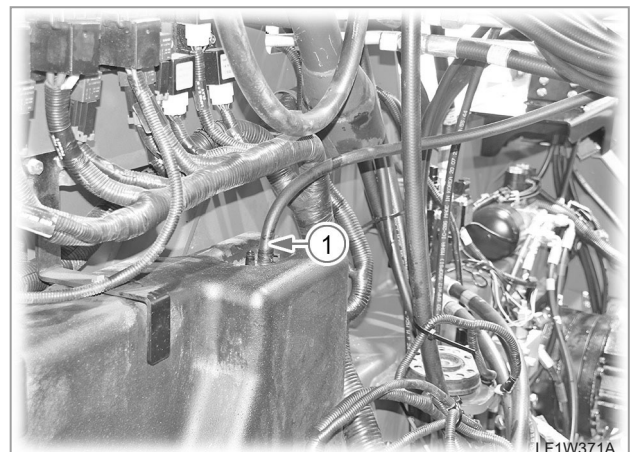
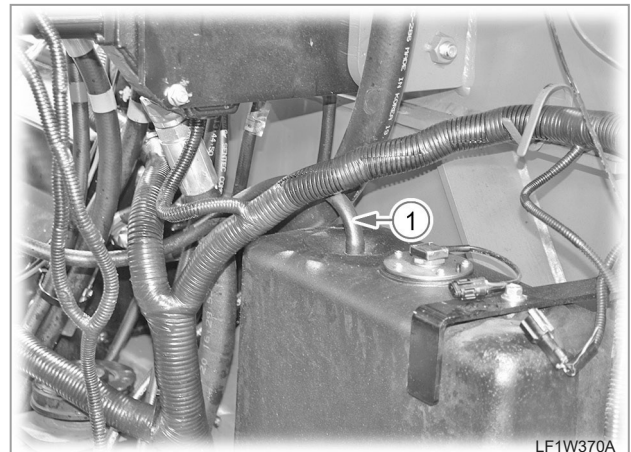
4. Remove the lift cylinder retaining pins (1), boom auxiliary support pins (2) and boom retaining pins (3) to remove the boom assembly (4).

6.5 FUEL TANK DISASSEMBLY

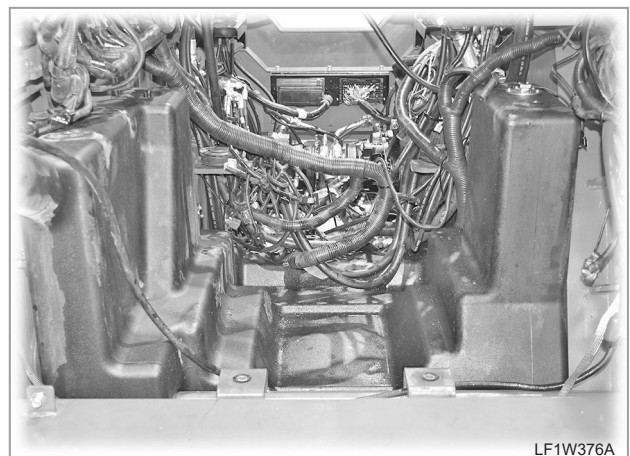
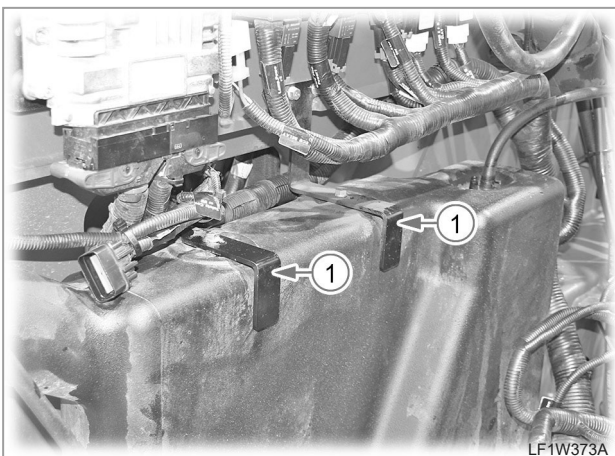
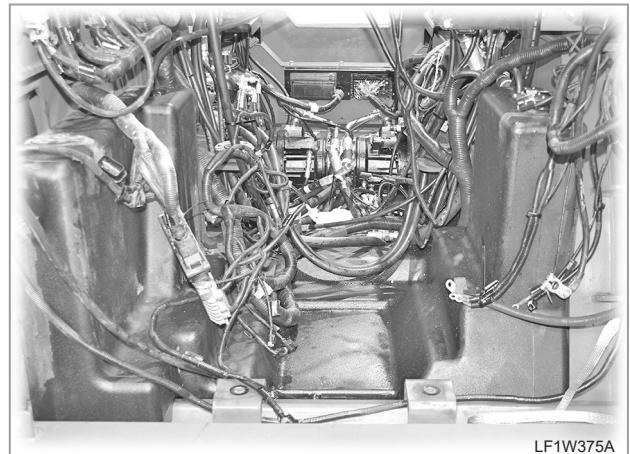
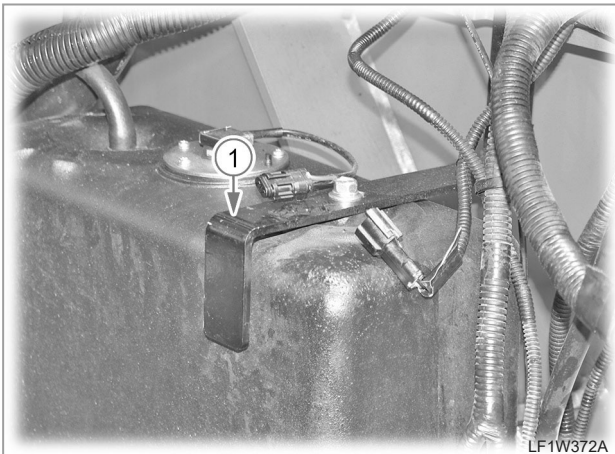
1. Remove the engine/HST pump assembly.
(Refer to "Engine removal" in Chapter 2, Engine.)



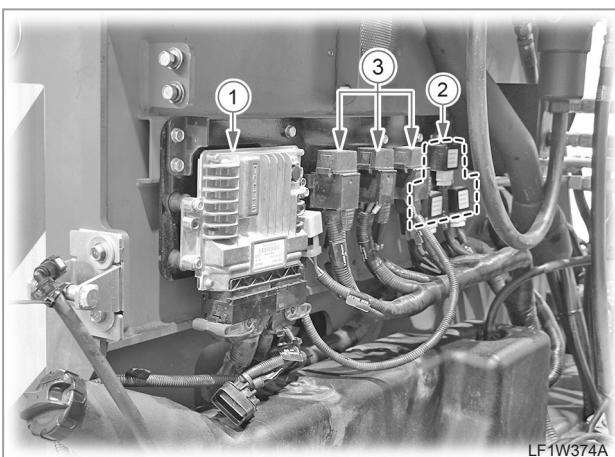
2. Disconnect the fuel sender connector (1).



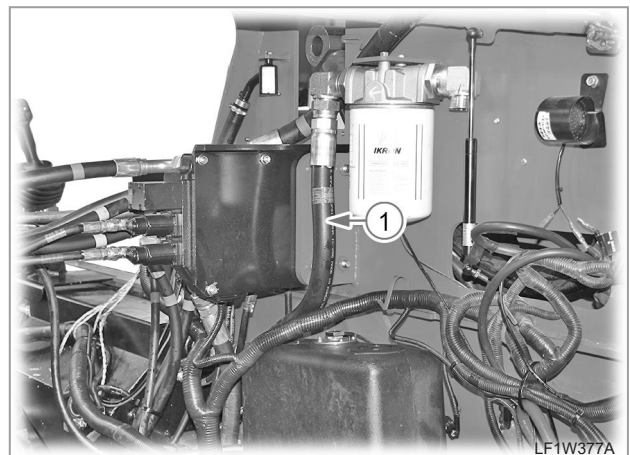
3. Disconnect the fuel tank bleeding hose (1).



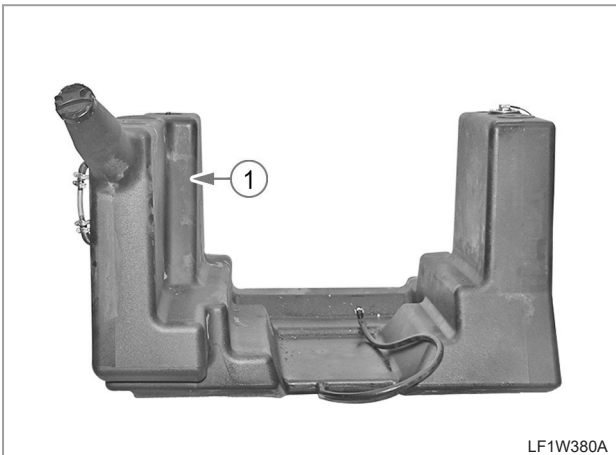
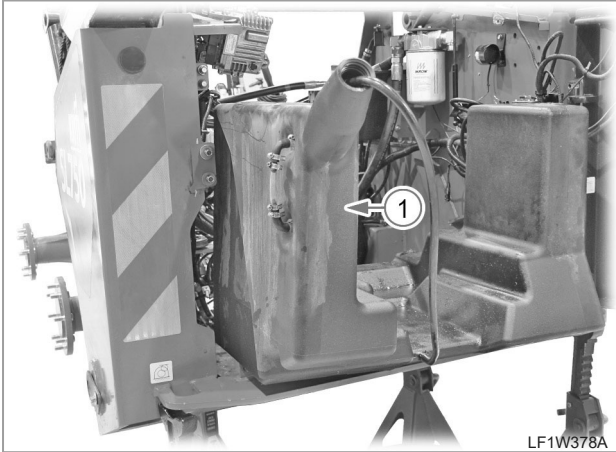
4. Remove the three fuel tank supports (1).



5. Remove the ECU (1), relays (2), and fuses (3).

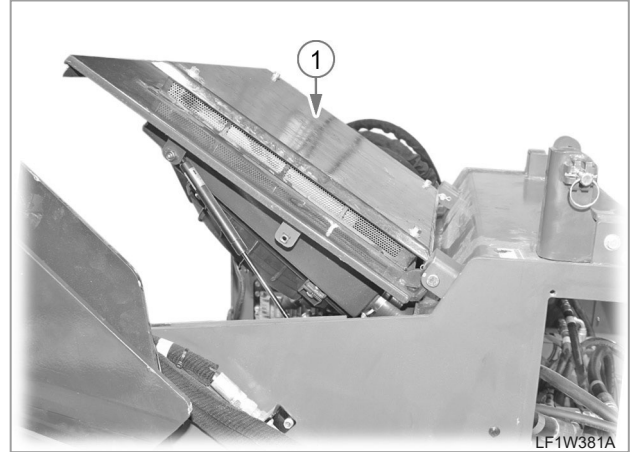


6. After arranging the wirings properly, disconnect the hydraulic hose (1).

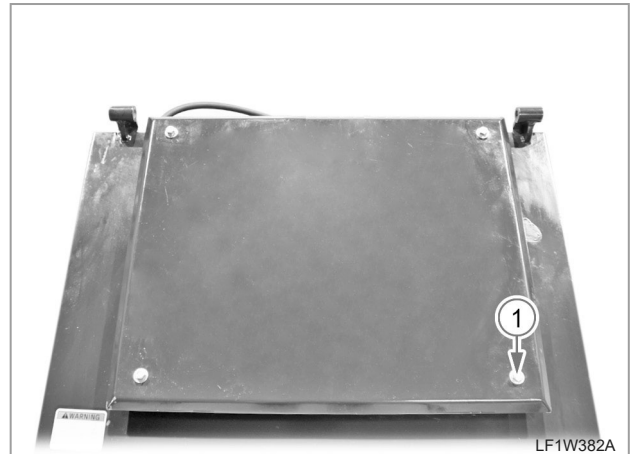


7. Remove the fuel tank (1) from the main frame.

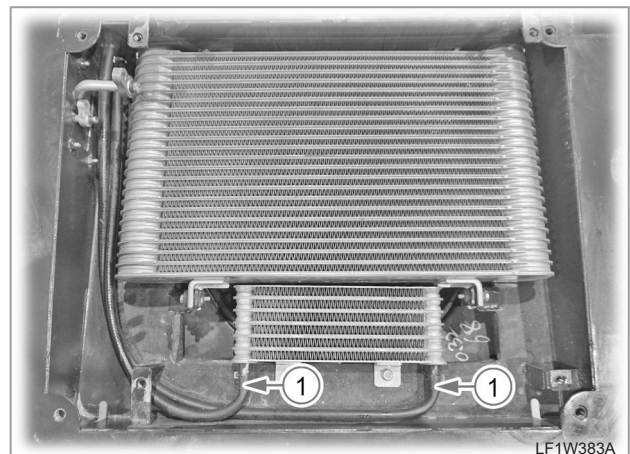
6.6 FUEL COOLER DISASSEMBLY



1. Remove the top cover (1) of the engine compartment.



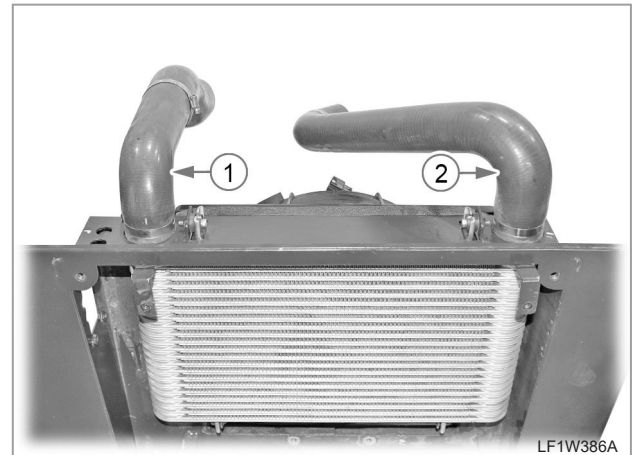
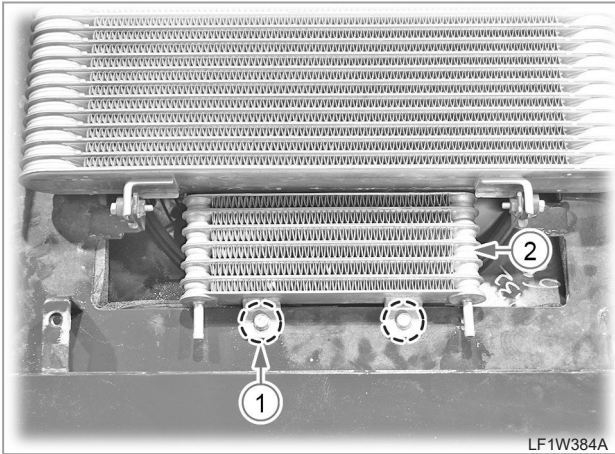
2. Unscrew the cover mounting bolts (1), and then remove the condenser from the inside.



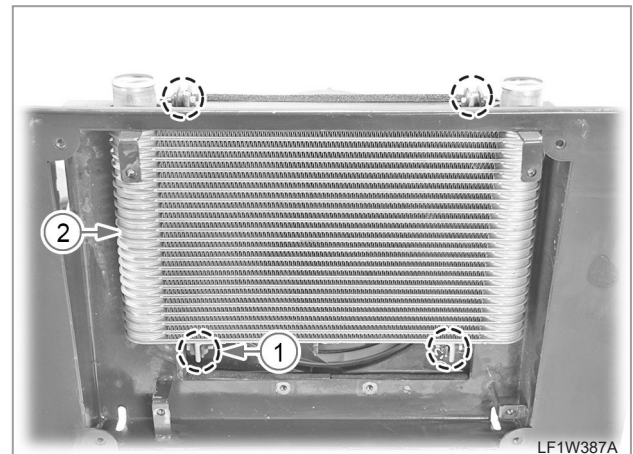
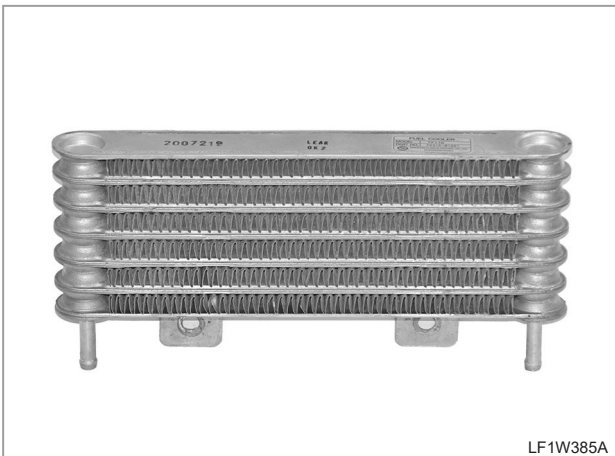
3. Disconnect the fuel hoses (1).

6.7 INTERCOOLER DISASSEMBLY(HS120V)

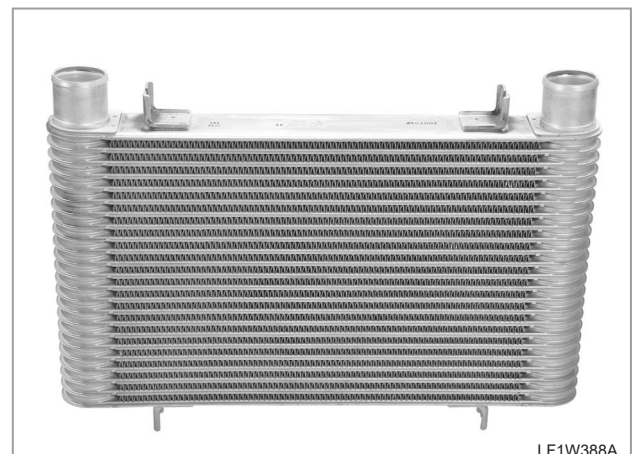
1. Remove the A/C condenser.



2. Disconnect the intercooler hoses (1 & 2).



4. Unscrew the fuel cooler mounting bolts (1)(2EA) and remove the fuel cooler (2).



3. Unscrew the four intercooler mounting bolts (1)(4EA), and then remove the intercooler (2).

[illegible]