

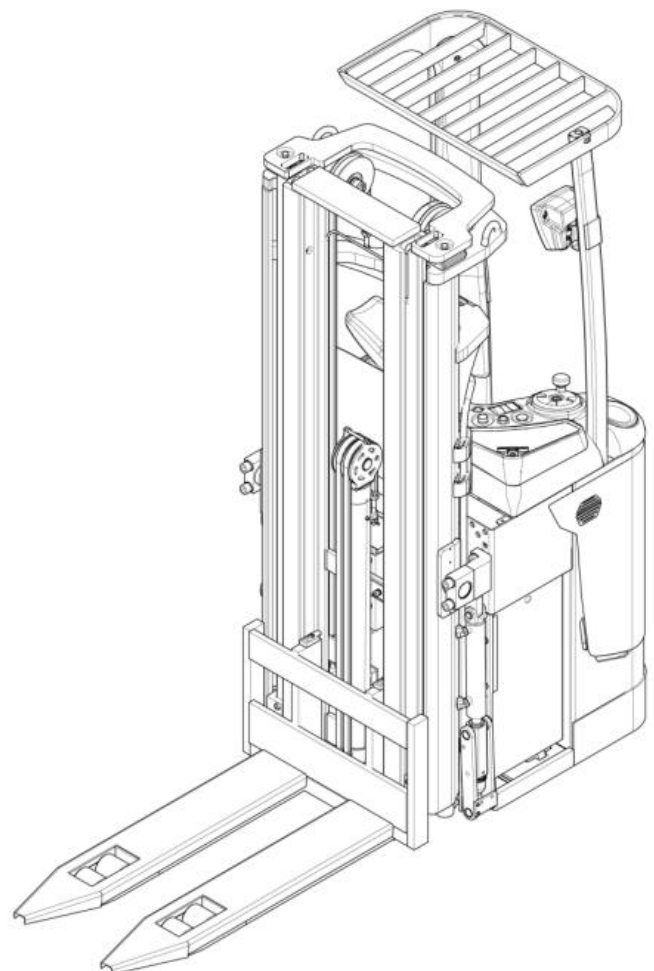


SERVICE MANUAL

SBR

12N/16N/16NI/20N

619099



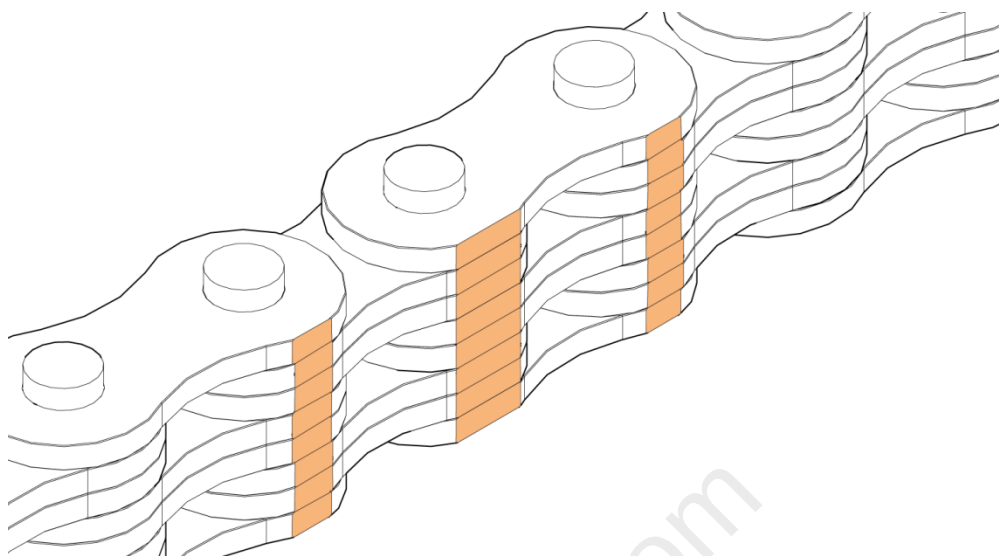


Figure 66. Checking the chains for edge wear

The wear of a link plate edge should not exceed 5%.

Turning or protruding pins

A highly loaded chain operated with inadequate lubrication can generate abnormal friction between the pins and the link plates. In extreme cases, the torque can surpass the press fit force between the pins and the outside plates, resulting in pin rotation. When a chain is operated in such a condition, a pin or a series of pins can begin to twist out of the chain, resulting in failure. See Figure 67 below.

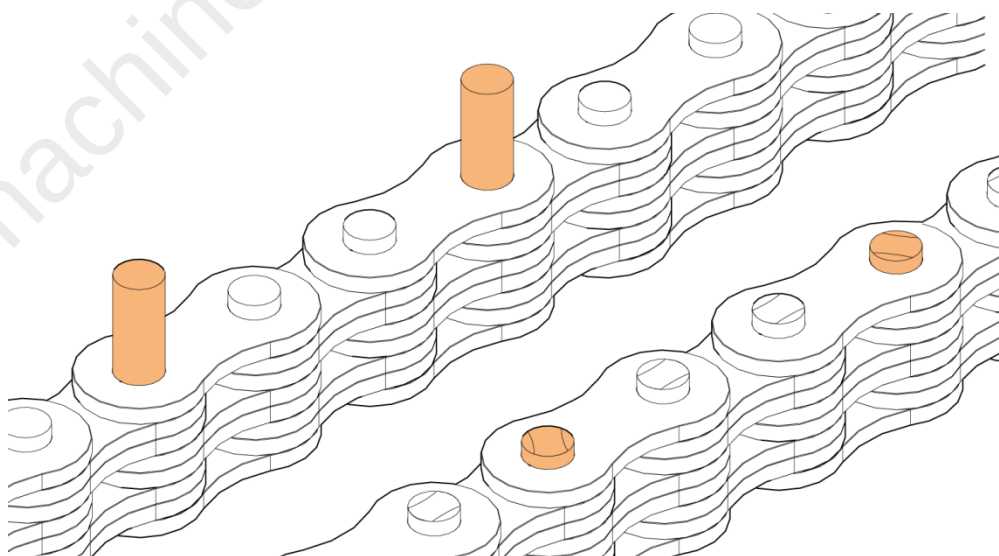


Figure 67. Protruding and turning chain pins

13.2 Pump controller



NOTE: Before you start to troubleshoot the truck, make sure that all the power supplies, fuses and connections are in order. Low voltage in the controller can cause different sorts of alarms.

The fault diagnostic system of the pump controller is divided into two main groups:

- Alarms

These are faults, which open the power bridge and, when possible, also the main contactor is opened and the magnetic brake activated. Failures in the motor, the controller or the safety functions cause alarms.

- Warning

These are faults, which do not stop the truck or stop the truck by using regeneration braking. The controller is working well, but it has detected some conditions that reduce the performance or stop the truck without opening the power devices. Incorrect operation sequences or conditions requiring performance reductions (for example, high temperatures) cause warnings.

The text "Stored" means that the alarm or warning is stored in the pump controller logbook.

Table 23. Pump controller alarm codes

CODE	ALARM / CONSOLE DESCRIPTION		
8	Self diagnosis test failed WATCHDOG	(Alarm)	Stored
	This is a safety-related self diagnosis test within the logic between the master (drive) and slave (pump) microcontrollers. The alarm indicates that the master and slave watchdog message is missing or late. This alarm can be caused by a CAN bus malfunction, which blinds the master-slave communication. Check all the CAN bus cables and measure the bus resistance between CAN high and low. The bus resistance value should be 60 Ω. Measure also the CAN cables' resistance between the truck chassis and the 0 cables. There should not be any significant connection and the resistance value should be over 1 MΩ. If CAN bus is OK, the problem is in the controller and it must be replaced.		
13	Controller memory error EEPROM KO	(Warning)	Stored
	This warning is caused by a hardware or software defect of the non-volatile embedded memory supporting the controller parameters. This alarm does not prevent truck operation, but the truck will work with the default values. In case of this warning, perform a CLEAR EEPROM operation. Switch the key off and on to check the result. If the alarm occurs permanently, replace the pump controller. If the alarm disappears, the previously stored parameter values will have been replaced by the default values.		

	Truck types									
	SBSN	SBSN I-Mast	SBRN	SBRN I-Mast				Default	Adjustment range	NOTE
AUX FUNCTION #7	1	1	1	1				1	0-9	EMB TIME DELAY, It is the time delay before brake is engaged.
SET OPTIONS:										
TILLER SWITCH	HANDLE	HANDLE	HANDLE	HANDLE				HANDLE		Factory setting
HOOR COUNTER	RUNNING	RUNNING	RUNNING	RUNNING				RUNNING		Factory setting
BATTERY CHECK	2	2	2	2				2		0 = disabled, 1 = lift cut out, 2 = travel speed reduction to 2,5km/h
STOP ON RAMP	ON	ON	ON	ON				ON	ON/OFF	ON = truck stays at ramp OFF = truck does not hold it still at ramp
AUX OUTPUT #1	BRAKE	BRAKE	BRAKE	BRAKE				BRAKE		Factory setting
SET MOT. TEMPERAT	ANALOG	ANALOG	ANALOG	ANALOG				ANALOG		Factory setting
QUICK INVERSION	NONE	NONE	NONE	NONE				NONE		Not in use
CAN ENCODER	ABSENT	PRESENT	ABSENT	PRESENT				ABSENT		ON = Mast encoder card present, OFF = Mast encoder card disabled.
INVERSION MODE	ON	ON	ON	ON				OFF		ON = when truck travel speed is changed by steering, if throttle lever passes 0-point truck continues to travel. OFF = stops at same situation and throttle lever must be released
BEAN PANEL	PRESENT	PRESENT	ABSENT	ABSENT				PRESENT		PRESENT = BEAN panel in use. ABSENT = BEAN panel not in use.
DISPLAY	PRESENT	PRESENT	PRESENT	PRESENT				PRESENT		Present = display installed. Absent = no display installed. If display is broken, truck can be driven if this is set to absent.
LOAD SENSOR	PRESENT	PRESENT	PRESENT	PRESENT				PRESENT		Present = load sensor installed, absent = no load sensor installed
AUX INPUT #1	0	0	0	0				0	0-4	XA1/21input type: 0 = speed reduction 1 = lift disabled 2 = traction disabled 3 = lift and traction disabled 4 = output XA1/32 control + pump running with certain speed / ramp. Pump runnig speed can be adjusted with parameter 1st SPEED FINE.
AUX INPUT #6	LEVEL0	-	LEVEL0	-				LEVEL0	0-2	XA1/6 INPUT. Level0 = driving speed 2,5 km/h Level1 = driving speed 2,5 km/h + total lift stop Level2 = driving speed 2,5 km/h + resettable lift stop
SEAT LEVEL	2	2	2	2				2	0-2	Seat switch type, 1 = NC, 2 = NO
TRUCK DIRECTION	1	1	1	1				1	None, 1, 2	Truck travel direction. 1 = forks => forward. 2 = tractor => forward
ANG OFFSET	NONE	NONE	NONE	NONE				2	0-3	Display direction arrows None = forward => right, 1 = forward => down, 2 = forward => up, 3 = forward => left

8.4.10.1 Adjusting the air gap of the magnetic brake

During maintenance, check the air gap of the magnetic brake. Measure the air gap at the adjustment screws with a clearance gauge. The air gap must be 0.3 – 0.4 mm at all the adjustment screws, i.e. throughout the magnetic brake.

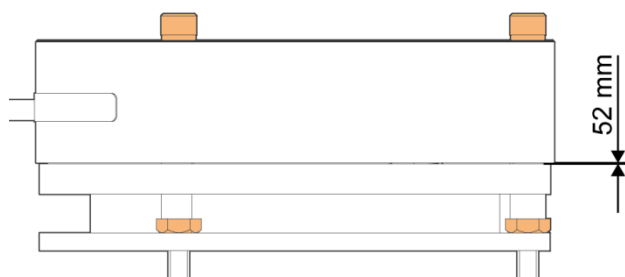


Figure 114. Adjusting the air gap of the magnetic brake

8.4.10.2 Coil resistance measurement

Use a multimeter to measure the brake coil resistance. The coil resistance has to be measured between the brake wires. The value should be ~15 Ω.

8.5 Pump motor

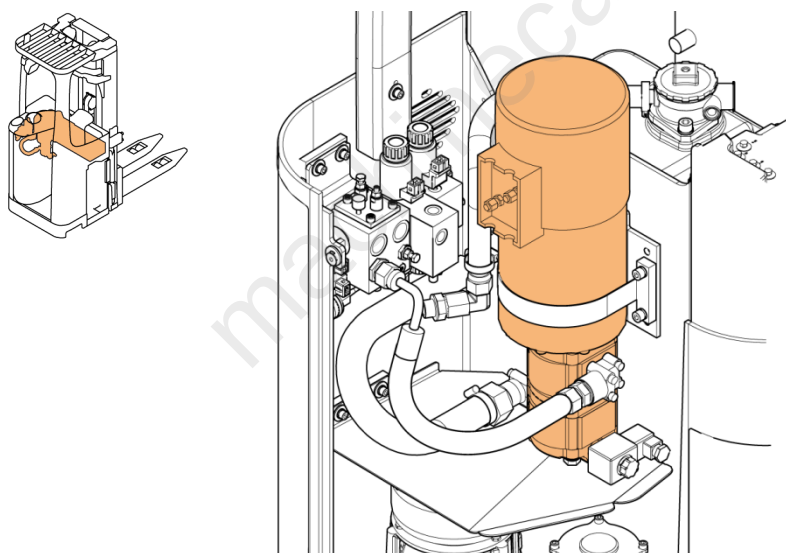


Figure 115. Pump motor overview

Full Version Available

Mitsubishi SBR16N Stacker Service Manual (619099)

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