

# CSM

CONSTRUCTION SYSTEMS AND MACHINERY

## OPERATING AND MAINTENANCE MANUAL



### **IMPORTANT WARNING:**

Do not operate the equipment before becoming completely familiar with the entire contents of the instruction manual.

Rev. 01  
APRIL/2018

The purpose of this publication is to instruct the operator and, thus avoid the occurrence of any damages from misuse, insufficient, or incorrect maintenance.

# CONCRETE MIXER MODEL CS 400 LITERS - COMBUSTION

**1. INTRODUCTION**

The purpose of this manual is to inform the user on the correct use and maintenance procedures on the equipment, in order to avoid incidents, accidents, defects, and losses derived from misuse or due to failure in performing preventive maintenance. Read this manual carefully before starting to operate it for your own safety and to make sure you are using it and operating it correctly. If the user has any questions on how to install, operate, or perform maintenance of this equipment, get in touch with CSM or one of its own Authorized Technical Support Centers. You will find an updated list of Technical Support centers on the CSM website at: [www.csm.ind.br](http://www.csm.ind.br).

**2. RECOMMENDATIONS**

We recommend reading this manual before operating this equipment, as there is information in this manual on: the structure, installation, running, operating, and maintenance. The instructions must be strictly followed by users in order to provide the maximum safety to operators and validate the warranty rights of the equipment, as stipulated by the CSM Company.

It is extremely important to keep this manual in an easily accessible location. There are required instructions for performing efficient and proper maintenance procedures.

The maintenance plan must be carried out by specialized technicians due to the responsibility involved in operating the equipment, therefore, we recommend CSM professionals to perform proper maintenance. Whenever maintenance is performed improperly, there are increased risks of defects and breakage and in this way negatively impacting the safety and stability of equipment operation.

The purpose of daily inspections is to detect evident defects in essential operating parts and safety hazards, as well as keeping the equipment clean and well-lubricated.

**CAUTION!**

Before turning on the machine, check and lubricate the following important locations.

**LUBRICATION**

**A new machine is not lubricated.**

**Before using the concrete mixer, the grease nipples must be lubricated.**

There are 05 grease nipples. Before using the concrete mixer, the grease nipples must be lubricated. Clean the excessive grease off to avoid storing products that may be harmful to the equipment.

**Do not lubricate the ring gear.**

Lubrication can facilitate the accumulation of abrasive particles, may wear faster the pinion.



**IMPORTANT**

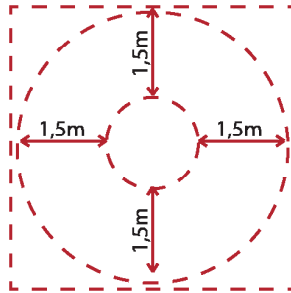
**CSM not be liable for any damage caused to the equipment due to lack of lubrication, in this case the user will lose your warranty.**

### 3. SAFETY AND ROUTINE CARE INFORMATION

Many accidents can be avoided if the instructions stated in this manual are correctly followed. You need to certify your understanding of all the operating procedures before operating the equipment. Safe operation requires becoming familiar and properly trained. All operators must be instructed by a qualified professional, trained and supervised by a professional legally competent person, based and proven by certification and/or an attendance list. Important: Every year the operator must repeat the training course again. All necessary measures must be implemented for accident prevention in the worksite, as stated in the guidelines in this manual and the referenced safety standards, which include NR18 and others as deemed necessary.

#### 3.1. GENERAL PRECAUTIONS

- » Before operating the equipment, perform an inspection (Item 3.3) for enhanced safety;
- » Whenever the machine is operating, animals and unauthorized people must be kept away at a safe distance:



- » Only qualified, competent, and authorized personnel must test, operate, perform maintenance, or repair the equipment;
- » Do not leave the equipment unattended while it is operating;
- » Always wear IPE's - Individual Protective Equipment - such as: helmet, ear protector, rubber gloves, appropriate footwear, and protective clothing - the correct IPE's must be reported to the PPRA (Environmental Risk Prevention Program) at the worksite (as stated in NR 09);
- » Keep the hands, hair, loose clothing, and tools away from the moving parts of the equipment;
- » It is prohibited to operate the equipment while wearing loose clothing and long hair due to the risk of the moving parts of the equipment grabbing these and causing serious accidents and even death;
- » Do not operate the equipment under the influence of medication, alcoholic beverages, and any other factor which may hinder your attention while working with the concrete mixer;
- » Always clean the equipment after using it and before storage it (see item 7 - on cleaning procedures);
- » Before storing the machine, check all parts. If necessary, check for any defect and change any damaged part immediately;
- » Check if the location for storing the equipment is dry and clean, and inaccessible to non-authorized personnel;
- » Use a system which is properly capability of hoisting and bearing the weight of the equipment and its components.

#### CAUTION!

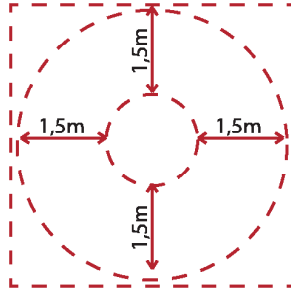
Trial and error is not the best way to become familiar with the equipment, as this can be expensive, reduce its useful life, and damage your equipment. If you have any questions on operating and maintenance, get in touch with CSM or one of its own Authorized Technical Support Centers.

#### IMPORTANT

It is expressly prohibited to adapt or modify any safety device or its original characteristics. CSM shall not be held liable for any eventual damages which occur due to modifications in the equipment and in this case, the product warranty becomes null and void to the user. All maintenance on the equipment must be performed by authorized professional personnel.

**3.2. MACHINE INSTALLATION: INSTALLATION PROCEDURE** ⚠️

- » **The machine must be installed in a covered location and protected from rain:** All worksites must have a minimum ceiling height of 2.80 meters, in order to protect from bad weather conditions and the falling of building materials.
- » **Moving:** Two workers must move the concrete mixer, pulling the drawbar. The passage way for moving the concrete mixer must be clear, flat, and firm.
- » **The installation floor:** The floor must be firm on a slightly slanted surface (preferably concrete), in such a way as to provide water drainage while operating the mixer;
- » **Machine safety clearance:** There must be at least 1.5 meters all around the concrete mixer until the guardrail, and 1.0 meter minimum height as stated in the NR12: 2010 standard, Attachment I, Table II.



**INSPECTION: Daily inspection is necessary before operating or after performing maintenance.**

**3.3. ITEMS WHICH NEED TO BE INSPECTED**

- » Lubrication points: 05 grease nipples;
- » The wooden hazard clearance barrier must be fastened very well at a minimum height of 1 meter and a minimum distance from the concrete mixer to the isolation barrier, at a minimum of 1.5 meter on all sides (the wooden barriers cannot touch the concrete mixer under any circumstances);
- » The operator must be trained and prove his/her training certification;
- » The concrete mixer must be leveled and well-fastened (no movement while in operation).

It is the responsibility of the direct overseer at the worksite to provide repairs on the concrete mixer, in cases of failed inspections. The worker is granted the right to stop working if the machine is not in safe operating conditions or does not conform to the manufacturer’s manual.

**4. EQUIPMENT CHARACTERISTICS**

**INTRODUCTION TO THE PARTS AND TECHNICAL SPECIFICATIONS**

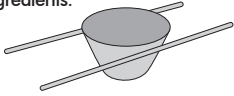
The CSM Concrete Mixer is a machine designed for the preparation of concrete by adequately mixing the previously measured materials. This equipment is used for preparing concrete and mortar for construction sites, general building needs. Even in cases of large-scale construction sites which require the supply of pre-mixed concrete, its role is important to provide additional support when needed.

Model	Without motor	Gasoline/Diesel
Drum capacity (L)	400	400
Mixing capacity (L)	280	280
Approx. number of cycles/hour	12	12
Drum rotation (rpm)	26	26
Rotation direction	Counter clockwise	Counter clockwise
Motor power	-	Gasoline: 5,5 HP – 13HP Diesel: 4HP – 9HP Electric Motor 2CV IV Poles
Transmission belt V	-	A56
Belt quantity	-	2
Weight (kg)	217	227
Dimensions (LxWxH) mm	1830x1000x1500	1830x1000x1500

## 5. CONCRETE PREPARATION

Use a bucket/can or another container to measure the ingredients.

01



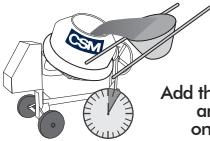
02

Place the gravel/rough sand gravel while the concrete mixer is TURNED ON.



03

Add half of the required water and mix for one minute.



04

Add the cement and mix for one minute.



05

Place the fine sand and the remaining water.



06

Mix the concrete for another 03 minutes.

### CAUTION

All raw materials for blending the concrete must be done while the concrete mixer is turned on.

## 6. SAFE WORKING PROCEDURES

Steps for handling the load and mixture:



01 - When the machine is turned off, tilt the drum to the ideal position for loading. The machine must be turned on, then load it with a bucket/can or other container. The maximum weight of 46 kg is recommended for ergonomic purposes.

02 - Load the drum as stated in item 5 "CONCRETE PREPARATION".

03 - The helpers must leave the defined guardrail area to operate the concrete mixer, as only the operator can stay near the machine.

04 - If it is necessary to add more ingredients to the mixture, then repeat steps 01 to 03.

05 - Wait for the required time so the concrete is perfectly blended.



06 - Unload the concrete in the wheelbarrow, metal pail or metal bucket.

## 7. CLEANING PROCEDURES

### CAUTION!

**The machine must be turned off and de-energized while cleaning.**

It is considered as de-energized when it is unplugged and/or the breaker switch is off and locked (lockout).  
See the technical manual for cleaning procedures.

Then to turn it on again, the machine must be dry and only the operator must be nearby, inside the hazard zone.

- » We recommend daily cleaning the concrete mixer drum with water for more durability and after that turn the drum opening downwards;
- » **Never wash the entire concrete mixer with water. There are parts which cannot be wet;**
- » Never hit the drum with a tool, as it can damage its surface;
- » Use grease in the temperature range from 25 to 115 °C, as specified in the DIN51825 standard.  
We recommend using *LITHLINE ATLANTIC EP-2* or *BARDAHL APG 1E.P* grease;
- » Apply the lubricant using the grease nipples placed in the lubrication points.
- » **We recommend lubricating the machine every 40 hours of operation and retightening all the screws and nuts.**

#### Minimum requirements on the maintenance check-list:

- 1 - Clean and grease any joints where there is wear and tear, as stated in item 2, on lubricating parts;
- 2 - Grease the five grease nipples and clean off any excess;
- 3 - Check if the electrical installation is in good condition;
- 4 - Check to see the fastening of the machine, see if it is still immovable and stable operating;
- 5 - Check the validity of the electrical installation official report and the ART;
- 6 - Check to see if the grounding is in good condition;
- 7 - Check if there is any risk of wetting the Concrete Mixer when raining (It cannot get wet).

## 8. STORAGE AND/OR WHEN THE WORK SHIFT FINISHES

- » Leave the drum turned downwards at the end of the work shift and/when it is stored;
- » Turn off the breaker switch and the lockout box locked or the main switch of the machine turned off and locked at the end of the work shift (the lockout-tagout procedure).

## 9. MAINTENANCE

Maintenance on concrete mixers must be done before beginning any construction site. After this initial maintenance is performed, it must be repeated monthly or whenever it is deemed necessary. In order to guarantee good equipment operation, it must be checked after performing heftier tasks, difficult operating conditions, and operated for long periods of time. Never perform maintenance tasks when the machine is turned on and certify that it is on a stable location as to avoid any risk of falling and damaging the machine, especially to avoid accidents.

### IMPORTANT

Always put the safety devices and shields back in place after repairs and maintenance procedures.  
Never modify the motor speed.

### 9.1. REPLACEMENT PINION

- » Remove the elastic ring with aid of a nose pliers;
- » Draw out pinion with a pulley puller, replace the damaged part and reassemble the machine by observing the adjustments as described in substitution of the rack.

### 9.2. REPLACEMENT RACK

- » Remove the damaged rack, unscrewing it from the drum, according to the following recommendations:
  1. Adjust the center of the rack relative to the drum compensating the difference with flat washers, fixed between the drum and the rack;
  2. Adjust the clearance between the teeth between the rack and pinion.

### 9.3. REPLACEMENT DRUM

- » Remove the rack, seal cap, external washer and nut;
- » Turn the tilting beam and place the opening of the drum downwards;
- » Release the drum, hitting the ring of base plate evenly in order to remove it easily;
  - Comment: use a piece of wood to hit the bottom of the drum as to not cause any deformations.
- » Replace the damaged part and reassemble the machine, following the assembly recommendations.

### 9.4. BEARING REPLACEMENT

- » After removing the drum, remove the nut from the axle;
- » Release the axle, hit the threaded tip of the axle, using a hammer, a piece of wood, and piece of DIN 2440 pipe which is a 1 inch nominal diameter against the axle to do this in such a way as to avoid damaging it;
- » Use a pulley remover tool to help remove the internal and external rings of the bearings;
- » Replace the bearings and proceed in the reassembly of the structure, be careful not to over tighten the nuts as to avoid exerting too much pressure on the bearings.

### 9.5. BELT REPLACEMENT

- » Remove the belt;
- » Stretch through the slotted holes and tighten the screws.

## 10. WARRANTY

The CSM Concrete Mixer has a warranty of 180 days, beginning on the purchase date, based on the purchase date and the 90 day legal warranty as defined by the applied legislation is included in this period, as soon as the applicable legal dispositions are observed and respected, referenced to defects in material or manufacturing. Repairs or defective part replacement during the valid warranty period may only be performed at the Authorized Technical Support service centers. It is required to show the purchase bill of sale.

#### **This warranty does not cover the following cases in the equipment:**

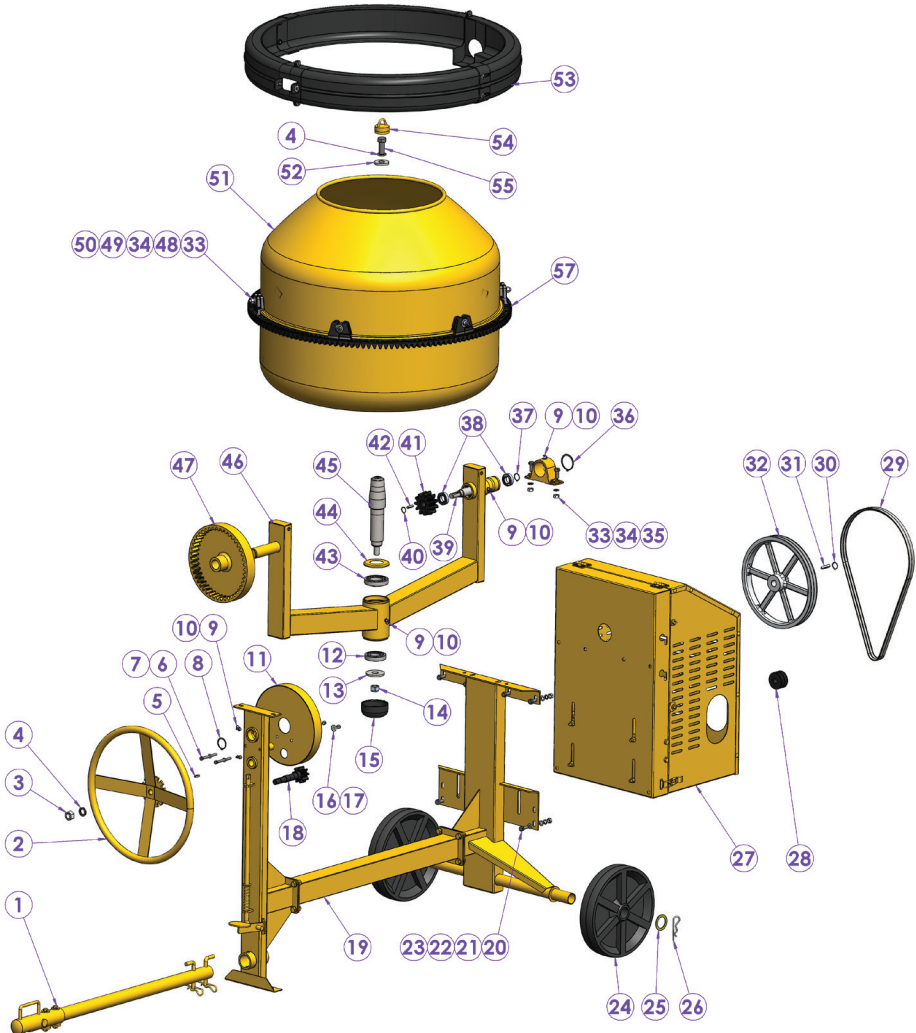
- » Incorrect handling;
- » Non-compliance of adequate maintenance procedures, as recommended by CSM;
- » Violation, disassembly, or adulterating without express authorization from the CSM Technical Support;
- » Using the machine for other purposes apart from its original design purposes;
- » Infractions of natural agents or abusive treatment;
- » Wear and tear from inadequate usage;
- » Bearings.

Equipment that presents problems during the valid warranty period and it has been proven to be a manufacturing defect, the repair will be performed at the nearest Authorized Technical Support Center, and the buyer is liable for all risks and expenses from roundtrip transportation to and from the technical support center. For further information see the website: [www.csm.ind.br](http://www.csm.ind.br)

### **CAUTION**

Maintenance services during the valid warranty period must be performed only at the CSM Authorized Technical Support Centers.

**11. PARTS LIST**





**12. PARTS LIST**

POS	DESCRIPTION	QTY.	DIMENSIONS	CODE
1	TOWBAR ASSY	1	VIDE DESENHO	40204067
2	FLYWHEEL ASSY	1	VIDE DESENHO	40204006
3	HEX NUT	1	M20	20375443
4	LOCK WASHER	2	M20	20312109
5	KEY 6X6X22	1	6X6X22	20335001
6	HEX BOLT	2	M8x80	20011062
8	FLAT WASHER	2	M8	20311015
9	ELASTIC RING	1	E-40	20304027
10	GREASE FITTING PROTECTOR 1/8"	5	GRAXEIRA 1/8"	20346005
11	GREASE FITTING 1/8"	5	1/8" BSP	20346004
12	GEAR PROTECTOR	1	VIDE DESENHO	40201350
13	TAPERED ROLLER BEARING	1	30208	20380025
14	EXTERNAL WASHER OF CENTRAL SHAFT	1	6,35xø25xø70	30011912
15	LOCK NUT	1	M20	20009336
16	PLASTIC SEAL CAP	1	2X47X108.5	20321056
17	FLAT WASHER	2	M8	20405221
18	LOCK NUT	2	M8	20375259
19	FLYWHEEL SHAFT WITH PINION	1	ø32Xø61X160	30201335
20	DISASSEMBLED CHASSIS (EASEL)	1	VIDE DESENHO	40201251

**12. PARTS LIST**

POS	DESCRIPTION	QTY.	DIMENSIONS	CODE
21	HEX BOLT	6	M10x30	20364054
22	FLAT WASHER	12	M10	20311017
23	LOCK WASHER	6	M10	20312009
24	HEX NUT	6	M10	20375025
25	RUBBER WHEEL	2	Ø 43.5xØ65xØ350	20371006
26	WASHER WHEEL	2	2.65xØ45xØ72	30201187
27	SAFETY CLIP 3X22X75	2	3X22X75	20345001
28	ENGINE HOUSING DISASSEMBLED	1	VIDE DESENHO	40201497
29	DRIVE PULLEY 65 2 CHANELS A	1	49xØ65	39002009
30	BELT V	2	A -56	20009863
31	ELASTIC RING	1	E-24	20304005
32	KEY 7X8X45	1	7x8x45	20010827
33	ALUMINIUM PULLEY	1	Ø353x50	20503034
34	HEX NUT	8	M12	20375001
35	LOCK WASHER	8	M12	20312186
36	HEX BOLT	2	M12x30	20364047
37	ELASTIC RING	1	E-57	20304019
38	ELASTIC RING	1	E-25	20304003
39	BEARING	2	6005 Z	20380026

**12. PARTS LIST**

POS	DESCRIPTION	QTY.	DIMENSIONS	CODE
40	PULLEY SHAFT	1	Ø30X255	30201153
41	ELASTIC RING	1	E-20	20304002
42	GEAR PINION	1	42xø91	30011827
43	KEY	1	6X6X30	20335021
44	TAPERED ROLLER BEARING	1	30210	20380021
45	UPPER SEAL CAP	1	0,9xø110	30201186
46	CENTRAL SHAFT	1	Ø63,50X304	30205067
47	DUMP ASSY	1	VIDE DESENHO	40201247
48	GEAR INTERNAL	1	ø229X105	30203886
49	HEX BOLT	6	M12x60	20003012
50	FLAT WASHER	18	3,30x13,50x32	20312124
51	DRUM SEAL WASHER	6	1,50xø12xø34	20316010
52	DRUM ASSY	1	VIDE DESENHO	40201175
53	EXTERNAL WASHER	1	Ø54XØ22,50X7,90	30205071
54	RING GEAR PROTECTION ASSY	1	VIDE DESENHO	40200019
55	BOLT PROTECTION ASSY	1	VIDE DESENHO	40201203
56	HEX BOLT	1	M20x50	20321952
57	BACK BUSHING	1	50.8x84x155	30010013
58	RING GEAR SEGMENTED	6	93x113x540	20002200

# CSM

CONSTRUCTION SYSTEMS AND MACHINERY



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CSM reserves the right to change this manual without any previous notice.  
The latest revised version is available for any interested parties in the CSM engineering department.