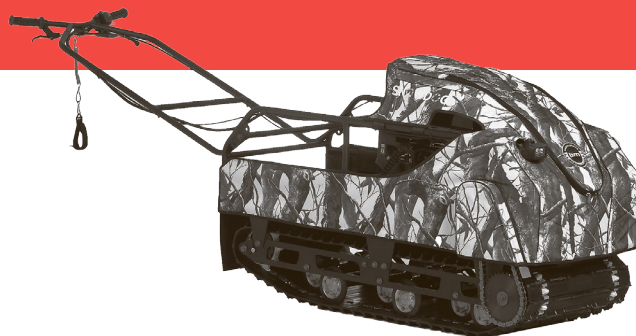


# SNOWDOG™

## SNOWDOG REPAIR MANUAL



### 1 Contents

1 General .....	2	8 Clutch .....	11
1.1 Precautions.....	2	8.1 Comet CVT (ZM184) .....	11
2 Description of SNOWDOG .....	2	8.2 CVT Safari. Inspection, maintenance, adjustment..	12
2.1 Key elements of SNOWDOG .....	2	9 Reverse gear .....	16
2.2 SNOWDOG controls.....	2	9.1 Oil change .....	16
2.3 SNOWDOG identification, model designation and the place of information labels .....	3	9.2 Removal, disassembly, assembly and installation of the reverse gear .....	16
2.4 Manufacturing number of SNOWDOG .....	3	10 Parking brake.....	17
2.5 Engine marking .....	3	10.1 Break gear. Inspection and maintenance .....	17
3 Preparing for repair and maintenance.....	3	10.2 Brake caliper. Checking, maintenance .....	18
4 Tooling.....	4	10.3 Disassembling the caliper.....	19
4.1 Screwdrivers .....	4	10.4 Brake discs. Check, removal, installation .....	19
4.2 Wrenches .....	4	11 Electrical system.....	21
4.3 INBUS wrench .....	4	11.1 Circuit diagram.....	21
5 General principles of troubleshooting and performance of works .....	4	11.2 Battery. Inspection and maintenance .....	21
5.1 Threaded Joint Tightening Torque Chart .....	5	11.3 Emergency engine switch, checking .....	22
5.2 Bearings are discarded if they have: .....	5	11.4 Steering switch, checking .....	23
6 Suspension. Check, removal, disassembly, adjustment	5	11.5 Headlight, inspection, replacement .....	23
6.1 Checking the status of the track .....	5	11.6 Engine protection by oil protection.....	23
6.2 Checking track tension.....	6	11.7 Removing and installing the engine .....	23
6.3 Checking the parallelism of the track shafts .....	6	12 Maintenance .....	24
6.4 Dismantling the suspension.....	6	12.1 After the first 5 hours of SNOWDOG operation ....	24
6.5 Assembling the suspension.....	7	12.2 Maintenance every 20 hours of operation.....	24
6.6 Suspension bogies .....	7	13 Storage .....	24
6.7 Track shafts.....	8	13.1 Preparation for storage.....	24
7 Transmission .....	9	13.2 Preparing for operation after seasonal storage (depreservation).....	24
7.1 Chain drive .....	9	14 Frequency of maintenance of SNOWDOG.....	25
7.2 Chain maintenance.....	10	15 Complicated operating conditions.....	25

## Introduction

The Manual for using the SNOWDOG equipment is prepared specifically for the company dealers and their qualified mechanics and specialists with the skills and understanding of the repair and maintenance of the SNOWDOG. Repair and maintenance of the equipment by non-professionals may cause serious damage to both SNOWDOG and users including anybody else being around. The SNOWDOG company constantly updates and improves its entire range of equipment, so the equipment described in the Manual may differ from any other repaired or maintained.

## 1 General

The Manual contains the information about maintenance, adjustment and repair of SNOWDOG. Photos and illustrations are to help readers cope with any of the above operations. All the instructions are presented in the step-by-step format and focus on the mechanics who operate SNOWDOG for the first time.

### 1.1 Precautions

The Manual uses special symbols: **WARNING** and **NOTE**.

#### **▲ WARNING**

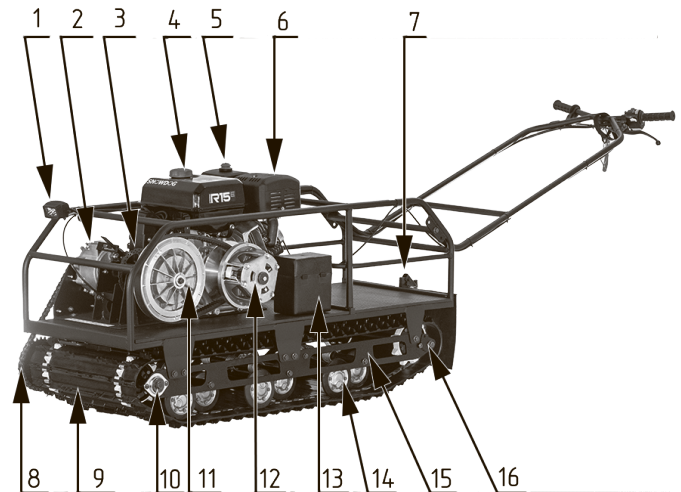
means a danger to life or health, which may arise as a result of negligence or carelessness. Some damage to equipment and vehicle may also be caused. You should take seriously the **WARNING** sign.

#### **☑ NOTE**

provides the information that is essential for the repair and maintenance of SNOWDOG.

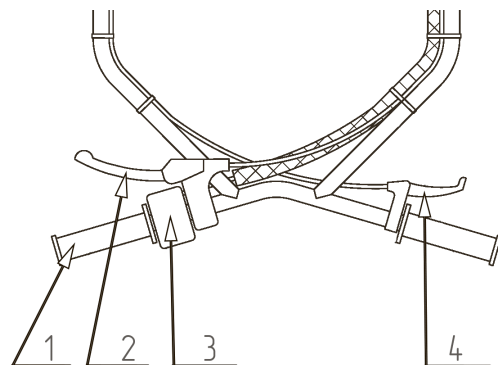
## 2 Description of SNOWDOG

### 2.1 Key elements of SNOWDOG



1. LED-headlight
2. Reverse gearbox
3. Brake disc
4. Fuel tank
5. Air filter
6. Muffler
7. Hooking device
8. Transmission chain
9. Track
10. Axle bearings (self-centering)
11. Driven pulley CVT
12. Driving pulley CVT
13. The battery
14. Wheel trolley of suspension
15. Side plate chassis
16. Track tensioner

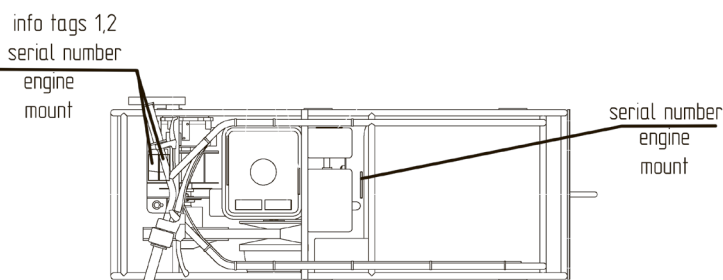
### 2.2 SNOWDOG controls



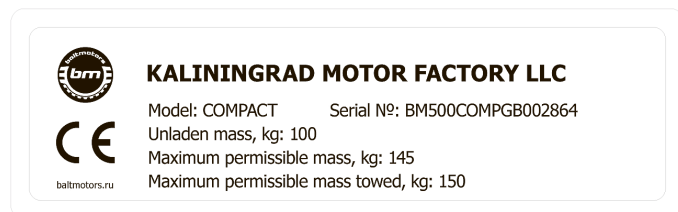
1. Steering handle
2. Parking brake
3. Steering switch box
4. Throttle lever arm

The Manual describes SNOWDOG models equipped with the engines **Brigs&Stratton: SNOWDOG COMPACT** and **STANDARD**.

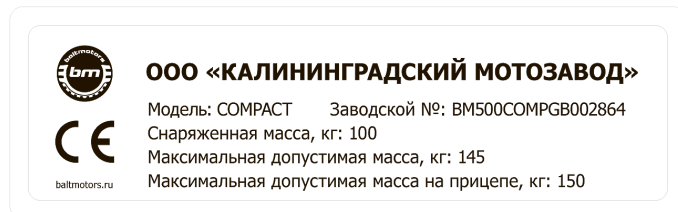
## 2.3 SNOWDOG identification, model designation and the place of information labels



Tag 1

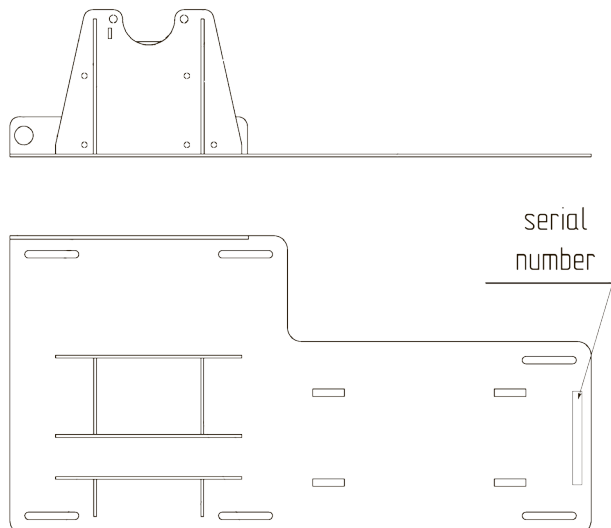


Tag 2



## 2.4 Manufacturing number of SNOWDOG

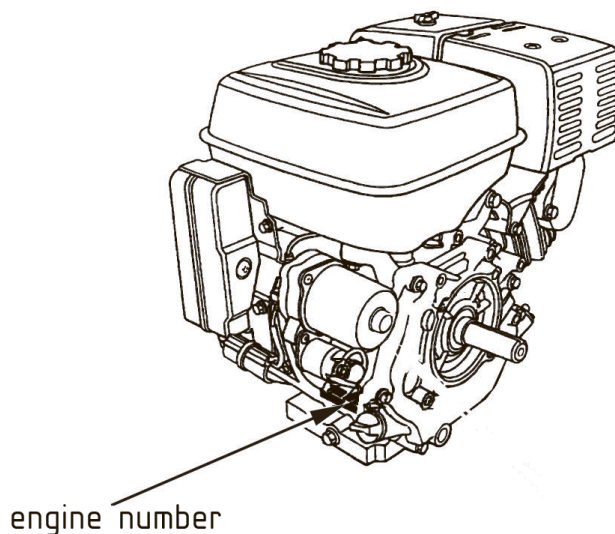
The manufacturing number is applied to the engine mount in the rear part (under the engine cylinder) by dot peen marking.



On the front of the engine mount glued are two information manufacturer's tags, which contain the information about the manufacturer, model and serial number of SNOWDOG.

## 2.5 Engine marking

The engine number is caused by dot peen marking on the engine crankcase at the front.



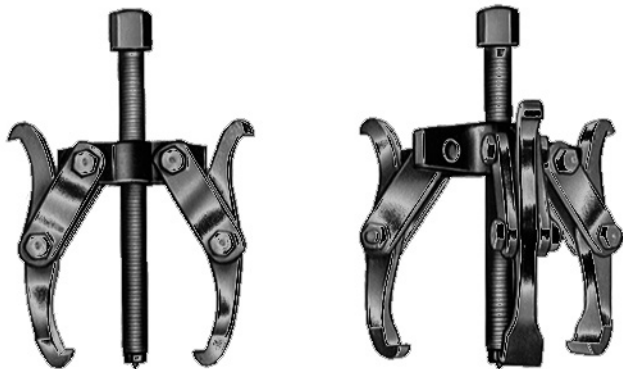
## 3 Preparing for repair and maintenance

1. Remove all dirt before repair and dismantling.
2. Use proper cleaning tools and equipment.
3. When dismantling SNOWDOG keep the joined components together. It includes mechanisms, cylinders, pistons and other joined parts that wear at the joints. The joined components should be assembled again in the same composition or replaced.
4. During SNOWDOG dismantling, clean all parts and place them in containers indicating disassembled mechanisms. This will speed up the assembly time and make it possible to set them again correctly.
5. Stay away from open fire.
6. Use oil and grease recommended by SNOWDOG. Other brands may be similar in terms of designation and properties but inferior in quality.
7. In disassembling components and mechanisms all the damaged or worn-out gaskets, seals and O-rings should be replaced.
8. All the mounting seats should be cleaned.
9. Properly lubricate all the joined parts and bearings during assembly. Use lubricants when installing seals.
10. Use an anaerobic thread lock where indicated. The surface of the thread should be cleaned and degreased before using the lock.

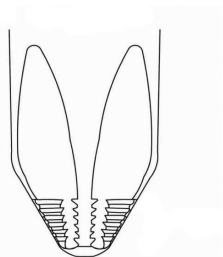
## 4 Tooling

Most of the operations described in the Manual can be performed with simple hand tools and measuring instruments that mechanics know quite well. Use the tools exactly as prescribed. Keep them clean and tidy.

To maintain SNOWDOG, wrenches and heads with sockets and ratchets of the following metric sizes may be needed, 10, 12, 13, 14, 17, an INBUS wrench of 5 mm, 3 mm and a cross screwdriver. You may also need pullers.

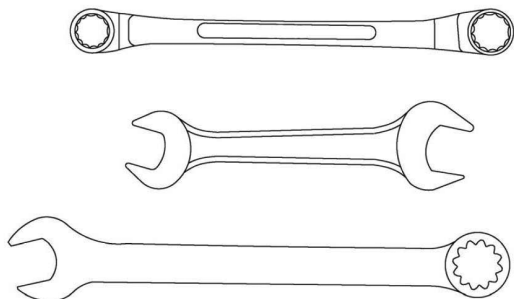


### 4.1 Screwdrivers



Use the screwdriver for screwing and unscrewing screws. Do not try in any other way to remove parts with a screwdriver. Damaged or worn-out screw drivers should be replaced. When using a screwdriver with the worn tip, it is quite likely that the fastening element will be damaged, and it will subsequently complicate its removal.

### 4.2 Wrenches

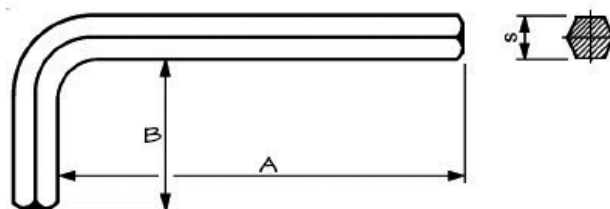


Open-end wrenches, box wrenches and combination wrenches may be of various types and sizes.

In most cases it is preferable to use a box wrench, particularly for final tightening of a mounting element.

**⚠ WARNING**  
**DO NOT USE HEADS FOR HAND TOOLS IN WORKING WITH PNEUMATIC TOOLS. THIS MAY CAUSE THEIR DESTRUCTION AND INJURY. USE EYE PROTECTION WHEN WORKING WITH PNEUMATIC TOOLS.**

### 4.3 INBUS wrench



With these models an INBUS wrench is used to adjust and customize the brake system. A key with the size  $S=5$  mm and 3 mm with a short handle ( $A \sim 100$  mm) or any other hex crest with the size of 5 and 3 mm with ratchet should be used.

## 5 General principles of troubleshooting and performance of works

Most of the operations described in the Manual are quite simple and can be performed given the basic tool handling skills. However, when performing major operations to dismantle the elements you should reasonably take an unbiased look at your ability.

1. In working with the engine and suspension parts SNOWDOG needs to be securely fastened.
2. For all identical parts they need to be marked on SNOWDOG. On the mating surfaces marks indicating their position relative to each other should be applied.
3. Removable wiring and connectors should be marked with adhesive tapes and markers.
4. The treated surface should be protected against physical damage and corrosion. Avoid contact with gasoline and other chemicals on the treated surface.
5. When working with stubborn and rusted bolts use a penetrating lubricant, for example, WD-40. If possible, avoid any strong thermal effects. At high temperature parts can melt and be deformed as well as the painted surfaces and plastic parts may be damaged.
6. If you are having trouble removing parts, you should determine the cause, eliminate and then continue with the removal.
7. Close all openings to prevent debris and foreign items from getting into the engine.
8. Before starting the procedure read the instructions guidelines and compare the parts with the pictures.
9. The term "replace" refers to the replacement of faulty parts with non-defective ones. The term "rebuild" means the removal, disassembly, troubleshooting, measurement, repair and assembly of parts.
10. The term "front side" in the Manual refers to the front part of SNOWDOG. The front side of a component is part of the component closest to the front part of SNOWDOG. The left and right sides are indicated relative to the driver's position when he stands in a sleigh heading forward.
11. Some procedures will require a hydraulic press or a special puller. Do not attempt to perform a similar procedure with any improvised means, it may cause damage of SNOWDOG.
12. It is much easier to repair SNOWDOG if you wash it before starting repairs. Use a degreasing agent. Before its use, consult the instructions for use.



**⚠ WARNING**  
**DO NOT AIM HIGH PRESSURE WATER JET DIRECTLY AT WHEEL BEARINGS, SUSPENSION PARTS, MUFFLERS, AIR FILTER AND ELECTRICAL COMPONENTS. WATER CAN FLUSH OUT THE GREASE FROM THE BEARINGS AND DAMAGE GASKETS.**

13. Compose the diagrams of similar components. For example, the housing bolts are often of different length, and the separated components can get mixed up making it difficult to reassemble them.
14. Make sure that all gaskets and washers are in place in the desired position.
15. Usually there are washers in places where the rotating parts are in contact with the fixed ones.
16. Use a new gasket if your old one is damaged.
17. When removing the self-locking fastening elements, they should be replaced with new ones. Do not install conventional fasteners instead of self-locking elements.
18. Use grease for fixing small parts, if they fall apart during assembly. Do not apply grease to brake parts, working surfaces of the cvt and electrical components.

### 5.1 Threaded Joint Tightening Torque Chart

Size of wrench, mm	Size of wrench, mm	N·m
10	6	5
12, 13, 14	8	15
14, 15, 17	10	30
17, 19	12	55
19	14	85
22	16	130

### 5.2 Bearings are discarded if they have:

Bearings are discarded if they have:

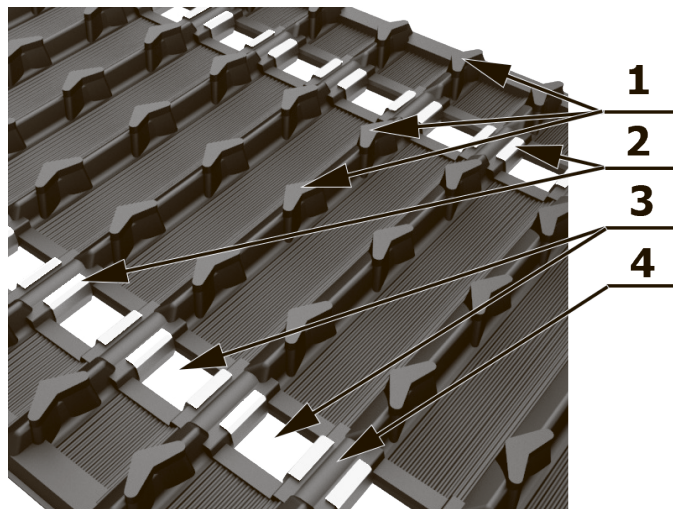
1. Cracks or traces of metal spalling on the rings or rolling elements.
2. Shelling.
3. Deep corrosion cavities.
4. Deep risks.
5. Chippings.
6. Through cracks in the separator.
7. Loose rivets in the separator.
8. Chippings and dents on the separator preventing the smooth rotation of the bearing.
9. Uneven wear of ground threads.
10. The stepped wear of the working surface of the rings visual and noticeable by touch.

Allowed are scratches and marks on the seating surfaces of the outer and inner rings, chippings and dents without impeding the smooth rotation of the bearing as well as the mat surface of ground threads and rolling elements.

Before testing the ease of rotation, the bearing is immersed in kerosene or diesel fuel (gasoline with 10% of engine oil possible) and then wiped with a clean cloth outside.

## 6 Suspension. Check, removal, disassembly, adjustment

### 6.1 Checking the status of the track



1. Lugs
2. Track clips
3. Track window
4. Lintel

The appearance of the track is checked by visual inspection. The track should not have any deep damage. If there is any sub-surface damage, it needs to be sealed to prevent moisture entering the cord of track and its being damaged. No cords should stick out from the side surface of the track. If there any protruding cord threads, they need to be cut. Short threads need to be cauterized. Before every journey check the condition of the metal clips on the track. If the clip is deformed, it is necessary to straighten out it. In the absence of clips, set it in place. Operation of damaged tracks leads to their short life.

Not allowed are defect, such as rubber cracks across the width of the track of more than 1 mm in depth. In operation of tracks with defects, rubber cracks will quickly gap and deepen and result in disjunction leading the track's eventually breaking down. Tracks with the following defects are not admitted for use:

1. Destruction of rods of more than 2 pcs. or more in a row, or piece by piece of 10% or more of the total (for the track COMPACT 4 rods, STANDARD 5 rods, MAX 6 rods).
2. Rupture of window lintels 2 pcs. or more.
3. Rupture of one or more lugs across the track width.
4. Rupture of the outer rubber layer and the lining fabric layer at the base of the lug with the length of 50 mm on one or both sides of the tracks in an amount of 10% of the total number of lugs (the number of lugs is equal to the number of rods).
5. Separation and rupture of lugs along the track edges in portions of 30 mm or more from one or both sides of the track in an amount of 10% of the total number of lugs.
6. Transverse rupture of track with the length of 50 mm or more in the amount of 1 pieces and more.
7. Separation of tracks in cord fabric layers with a length of 100 mm or more and a depth of 50 mm or more in the amount of 1 pc or more.
8. Separation and rupture of a fragment of the fabric and (or) the track rubber with a length of 100 mm or more in an amount of 1 pc. or more. The track elongation exceeds the track adjustment on SNOWDOG.

## 6.2 Checking track tension

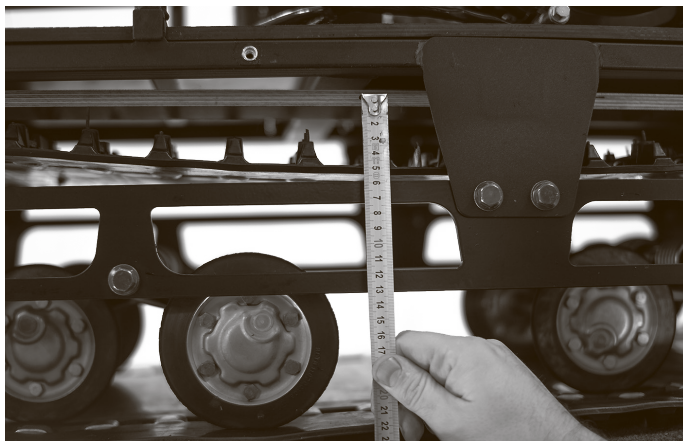
Before every movement check the condition of the track and its tension. Over tension leads to engine power loss in the suspension and causes overloads.

Place the SNOWDOG on a flat surface. Set SNOWDOG on a flat horizontal surface.

Put a plate on the track so that it rests on the upper part.

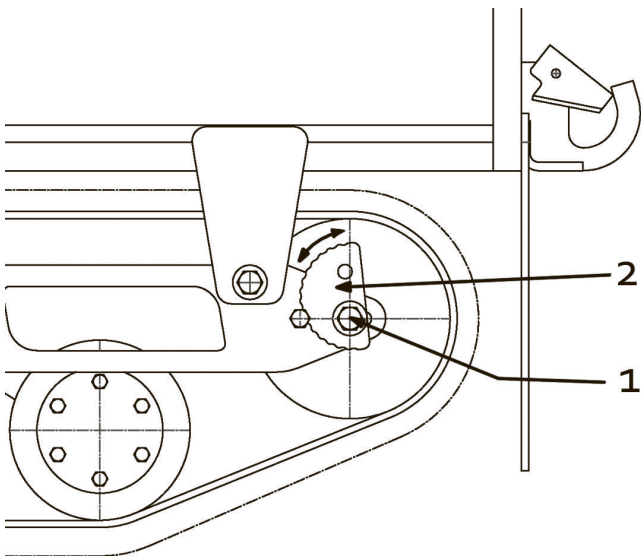
Measure the distance between the plate and slack track in the middle of its length.

Normally tensioned track deflects 15-20 mm (in the middle of its length) by gravity.



**⚠ WARNING**  
**IF THE MODEL IS EQUIPPED WITH CARRIER ROLLERS, THEN BEFORE CHECKING TENSION AND ADJUSTMENT, THEY SHOULD BE TEMPORARILY REMOVED.**

Loosen the bolts 1 on both sides of the rear shaft mount. Turn the tensioner eccentric 2 for axis offset.

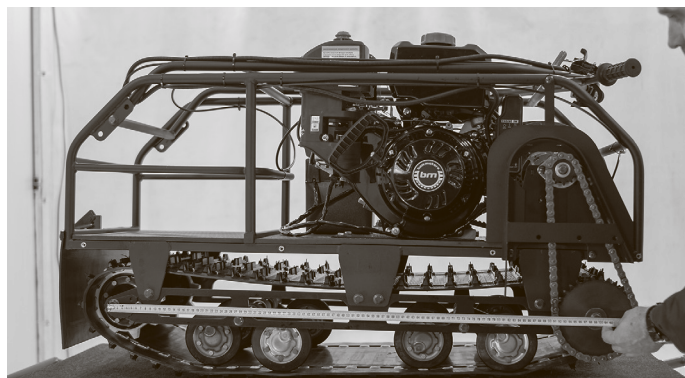


**✓ NOTE**  
**TO AVOID TRACK DISTORTION, ECCENTRIC DISTORTION TENSIONER ECCENTRICS SHOULD BE EQUALLY MOUNTED ON THE RIGHT AND LEFT SIDES OF SNOWDOG.**

Check the tension of the track.  
Tighten the bolts.

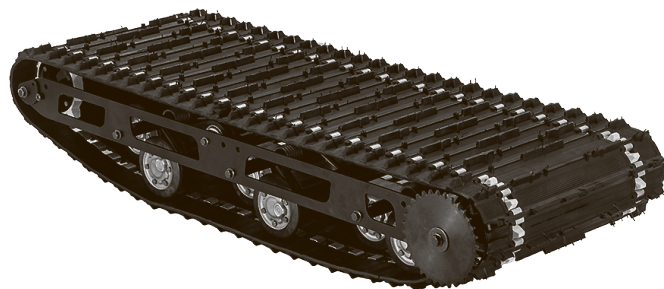
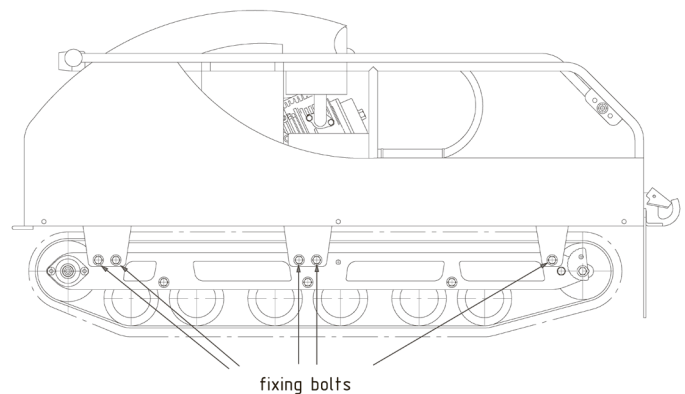
## 6.3 Checking the parallelism of the track shafts

To check the parallelism of the track shafts, measure the distance between the shafts on both sides of SNOWDOG. The distance should be the same. In case of discrepancy adjust with the eccentric of the track adjuster as specified in paragraph 6.2.

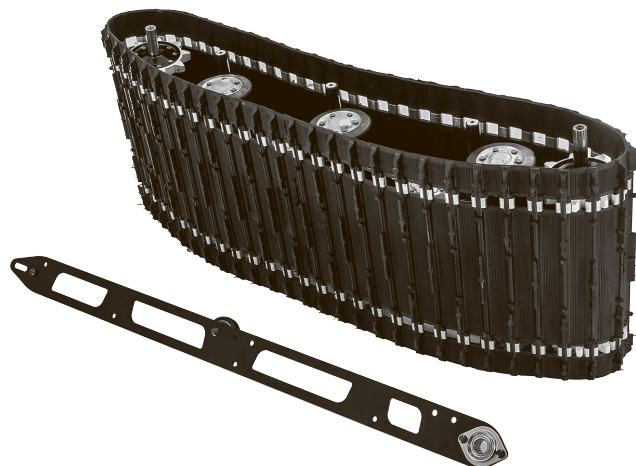


## 6.4 Dismantling the suspension

Remove the chain by disconnecting the chain lock or removing the driven sprocket. Remove the 10 fixing bolts used to fasten the suspension to the frame, and remove the frame.

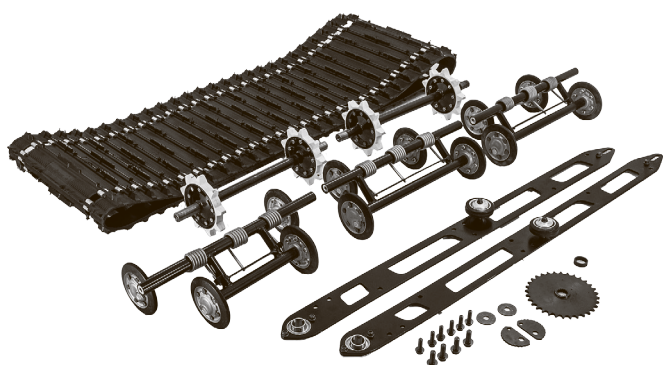


Loosen the track, as described under 6.2 .  
Unscrew the fixing bolts of frames and shafts on one of the side plates.  
Remove the side plate of the suspension.



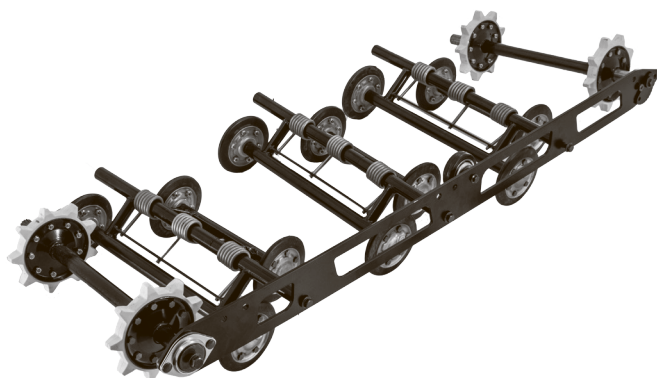


Unscrew the corresponding bolt on the other side plate and remove the required suspension element. If the full dismantling of the suspension is necessary, remove all the bolts of the second side plate and disassemble the suspension into components and parts.



## 6.5 Assembling the suspension

To assemble, lay out all the suspension elements and fasten them with bolts with one of the side plates by snugging up only by half.



Put the track on the edge and insert the assembled suspension inside. Then fasten the second side plate. Connect the suspension to the frame and tighten the fixing bolts.



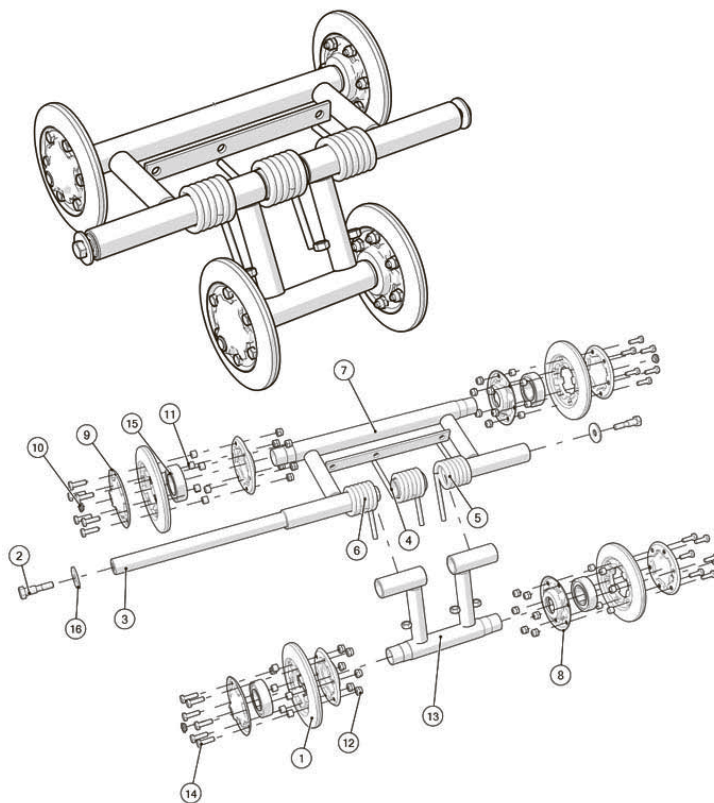
Set the chain.

**⚠ WARNING**  
**WHEN TIGHTENING ALL THE SUSPENSION BOLTS AND THE BOLTS HOLDING SUSPENSION TO THE BODY, USE THE ANAEROBIC THREAD LOCKER.**

Tighten all the bolts holding the suspension to side plates with the torque indicated in Table 5.1 on page 5 .

## 6.6 Suspension bogies

The SNOWDOG suspension is based on bogies, two or three depending on the model. Rubber wheel rollers fail when operated with high loads, colliding with obstacles and storing under the load. When springs wear out, SNOWDOG sags, becomes softer, the range of the track adjuster is insufficient to ensure tension. The worn-out spring should be replaced. The bogie springs differ by the direction of winding.



### Bogie setup:

1. Rubber roller rim
2. Bolt M8
3. Roller balancer axis
4. Bushing
5. Right roller spring
6. Left roller spring
7. Roller balancer
8. Internal cheek
9. External cheek
10. Plug
11. Plug of roller rim
12. Self-locking nut 6 DIN 985
13. Internal roller balancer
14. Bolt 6x20 DIN 933
15. Bearing 205
16. Washer 10 DIN 125

### 6.6.1 Checking bogie bearings

To check the status of bogie bearings, loosen the track. By turning the bogie wheel, check for noise and ease of rotation, the axial and radial runout.

If a bearing is worn-out, replace it. To replace it, remove the cheek wheel, remove the retaining ring and remove the bearing.

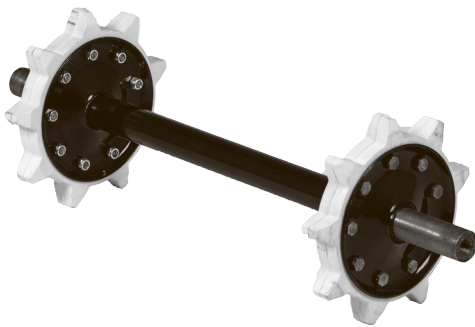


Check the bearing as indicated in **5.2 on page 5** If the bearing does not meet the parameters, replace it with a new one.

In mounting the wheel cheek, do not over-tighten fasteners. Overtightened cheeks may impede the movement of the wheels and deform the rubber rim. In tightening, check the wheel travel. If there is any difficulty, loosen the fasteners.

### 6.7 Track shafts

Track shafts are an essential element of the transmission. In the SNOWDOG of the model year 2016-2017 used are track shafts of two types.



1. The shafts are rigidly fixed to the side plates. The sprockets rotate on bearings. The shafts are those driven only.
2. The shafts mounted on bearings. The sprockets are rigidly fixed to the shaft.

Diagnostic principles are similar for all shafts.

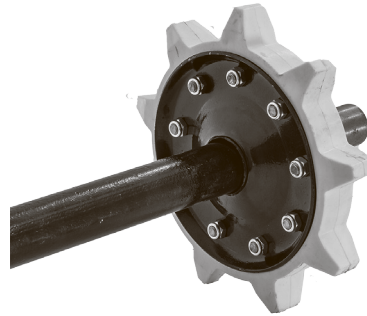
The principles of inspection and maintenance of all types of shafts are the same.

The shafts should not have more than 1 mm beats, nor should be bent. Operation of any broken shafts can lead to the tracks getting off the sprockets and jam, which is fraught with falls and injuries. The sprockets on the shafts should be arranged in parallel to each other and parallel to the sprockets on the second shaft. Failure to observe this condition, sprockets will wear the track in the windows, which can lead to the track's getting off the sprockets. Runout of sprockets no more than 5 mm is possible. Bearings are another important element of the shafts. The main cause of bearing failures is corrosion due to ingress of water in overcoming water obstacles. Replace defective bearings. The

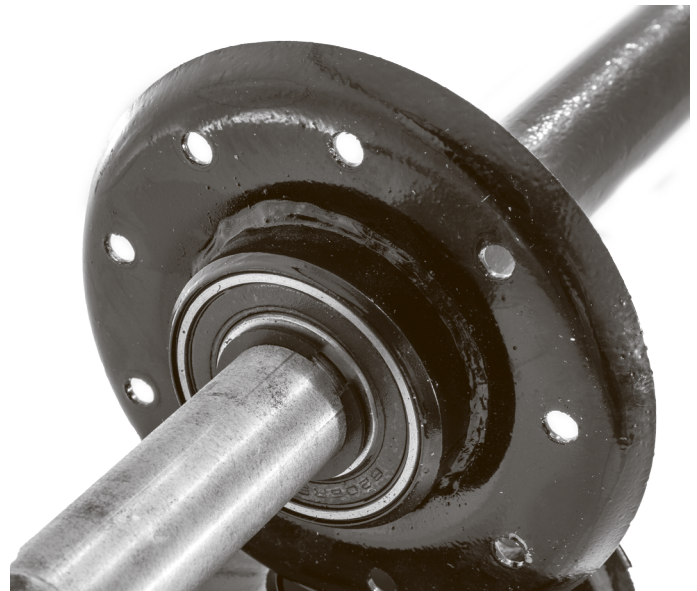


driving shafts are at one of its ends has the spline on which the driven sprocket is set. The spline should not be damaged. Damage to the shaft at the spline can be easily detected by the beating of the driven chain sprocket. A damaged shaft should be replaced. Beating will lead to chain flinging, and increased wear of bearings and the structure as a whole.

To maintain the bearings of the driven shaft, it needs to be removed from the suspension.



1. Using the wrenches 10 mm, unscrew the 9 bolts and nuts.
2. Remove the sidewall of the disc and the sprocket.
3. Remove the retaining ring.



4. Remove the bearing.
5. Check the bearing as indicated in **5.2 on page 5**. If necessary, replace it with a new one.
6. Install the bearing.
7. Install the sprocket and the sidewall of the disc.

**⚠ WARNING**  
**WHEN TIGHTENING THE FASTENERS, DO NOT OVERTIGHTEN. THIS WILL LEAD TO DEFORMATION OF THE SPROCKET AND DISC SIDEWALL.**

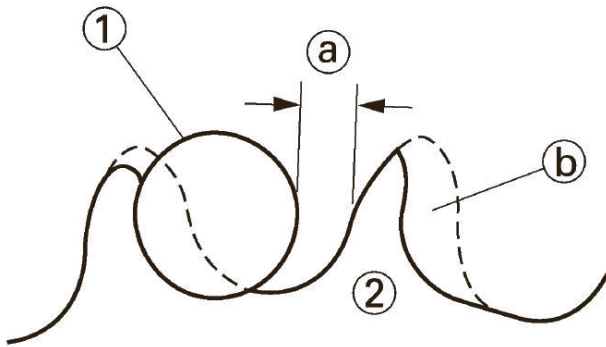
Tighten the nut so that the bolt protrudes 1 mm.

**⚠ WARNING**  
**WHEN TIGHTENING UP TIGHT ALL THE SUSPENSION BOLTS AND THE BOLTS HOLDING SUSPENSION TO THE BODY, USE THE ANAEROBIC THREAD LOCKER!**

## 7 Transmission

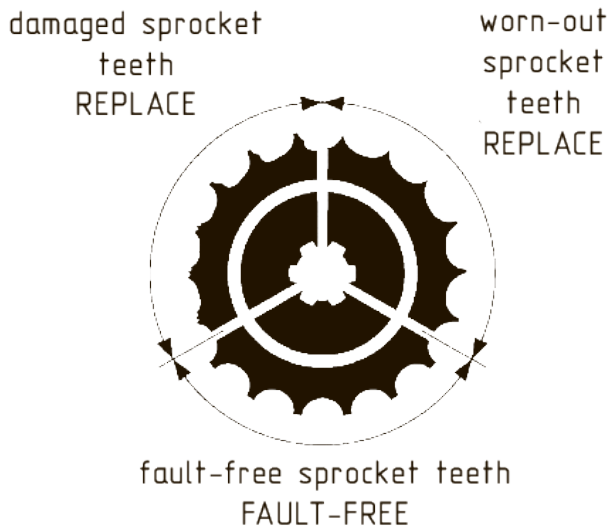
### 7.1 Chain drive

The chain drive should be checked before each journey. The chain drive includes the driving and driven chains of the sprocket. The main problem during the operation is the chain wear, respectively, a worn chain "gnaws" for itself a seat in the teeth of the sprockets.



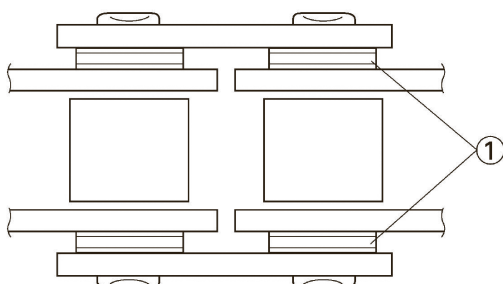
- 1 - chain pulley
- 2 - sprocket
- a - rate of wear of the tooth
- b - the outlines of the new sprocket.

The wear of the sprocket teeth exceeding the value of  $\frac{1}{4}$  of the size of the tooth is considered critical. If one of the components is critically worn-out, it is necessary to change the sprocket set (driven and driving) and the chain. Inspect the condition of the driven and driving sprocket wear and fracture.



You should ensure that the driven sprocket and shaft are not damaged. Collision with obstacles leads to bending of and damage to the sprocket and shaft. The driving sprocket wears slightly faster than the driven one but it is not subjected to shocks when driving over obstacles.

Chains with gland packing 1 O-ring can be mounted on SNOWDOG.



In such chains grease is put for the entire operation period of the chain but the seals need regular lubrication. The main purpose of lubrication of seals is to prevent heating and loss of tightness. Replace the chain, if the seals are damaged and stick out of it. The chain life depends on its lubrication. It is necessary to clean and lubricate the chain after each journey. When runs are more than 20 km, long movement in the puffy snow or water, the chain should be lubricated during the journey. It is recommended to use a special lubricant for chains in aerosol containers.

#### 7.1.1 Checking the chain tension

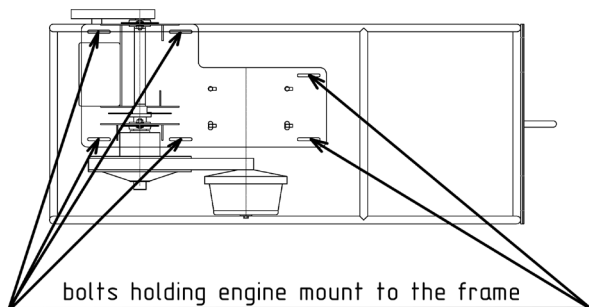


The normally tensioned chain in the middle between the sprockets has a free wheeling of 10-20 mm. Free wheeling of less than 5 mm will lead to a rapid stretching of the chain and sprockets. An overly loose chain can fling on the move. It is necessary to tighten a free chain. In the operation, the chain is extended, and the distance between the links changes. If the chain length adjustment range is no longer enough, it is necessary to replace the chain. A chain may not be shortened by removing one or more links. When cleaning the chain, check the condition of rubber seals between the plates of the chain. If the seals are damaged and stick out of the chain, the chain requires urgent replacement.



### 7.1.2 Method of chain tension

For the chain tension, loosen the six bolts holding the engine mount to the frame of SNOWDOG.



Move the engine mount with the engine for tensioning or loosening the chain.

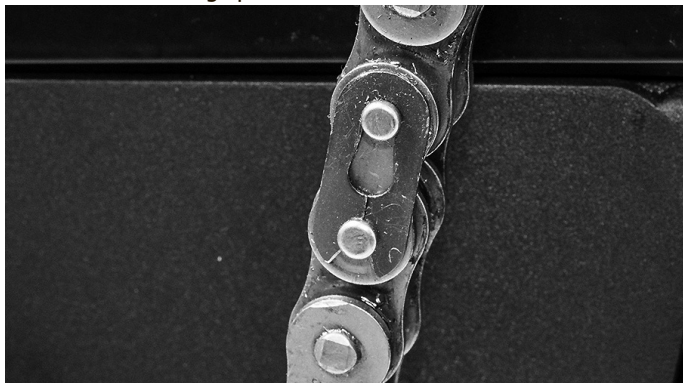
Tighten six bolts holding the engine mount.

### 7.2 Chain maintenance

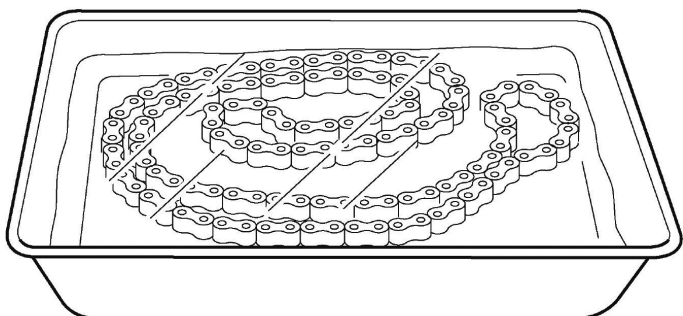
After each journey and every 10 hours of movement it is necessary to lubricate the chain.

Every 50 engine hours of SNOWDOG or at the end of each season, whichever comes first, it is necessary to maintain the chain. Follow the steps:

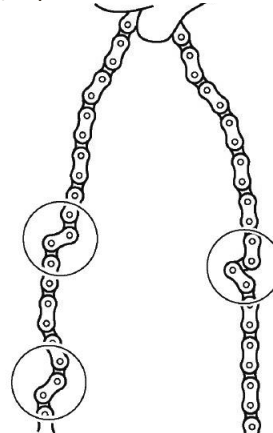
1. Clean the chain from dirt.
2. Remove the chain by disconnecting the lock or loosening sprockets.



3. Wash the chain by putting it in kerosene.



4. Remove the chain from the kerosene and dry it.
5. Check the chain mobility. If mobility is poor and/or uneven, replace the chain.



6. Set the chain on SNOWDOG and lubricate it.

A drive chain with rubber seals such as O-ring between the chain plates can be installed on SNOWDOG. Cleaning with steam, high pressure and the use of solvents may damage the seal. Use only kerosene to clean the drive chain.



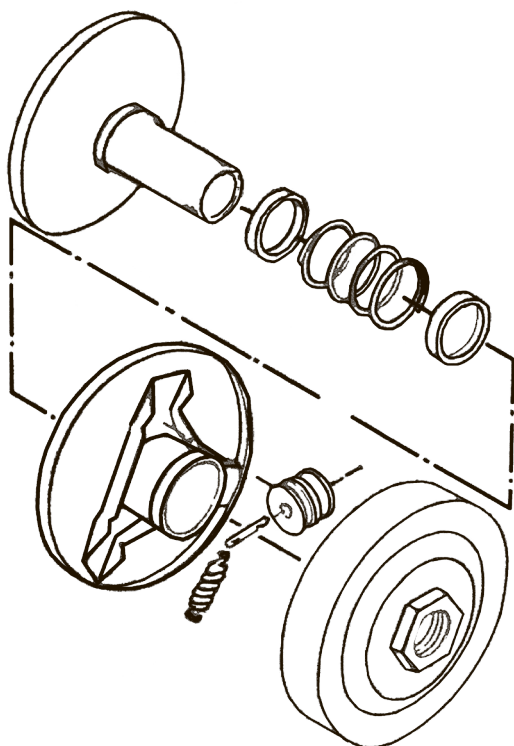
#### NOTE

**USE THE CHAIN LUBRICANT SUITABLE FOR CHAINS O-RING OR ENGINE OIL SAE 30~50W.**

## 8 Clutch

CVT is a continuously variable automatic V-belt transmission. The cvt consists of two pulleys, a driving one (hereinafter the centrifugal adjuster) and a driven one (the driven pulley). The cvt regulates the transmission ratio by two parameters, the rate of rotation (RPM) of the engine and the resistance to movement of the tow. Depending on the combination of these parameters while moving the tow a certain CVT transmission ratio is automatically set. The centrifugal adjuster performs the clutch function. When the engine rotational rate drops below 2200 rpm, the transmission of rotation from the engine shaft to the transmission stops.

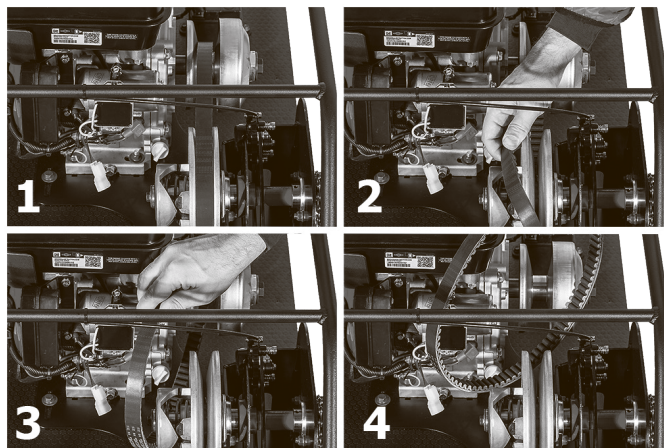
### 8.1 Comet CVT (ZM184)



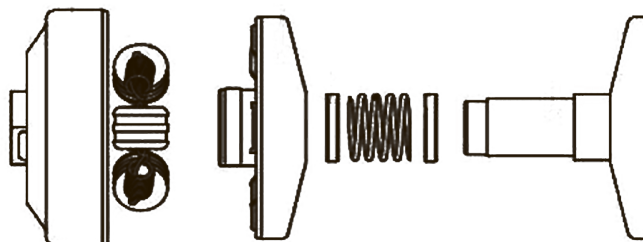
As long as the CVT belt wears, wear products fall into the places of sliding of bushings and the cvt rollers. This impairs the performance of the cvt and can lead to overheating and jamming. If a worn belt is replaced; or there visible deterioration of the cvt performance, it is necessary to maintain the cvt.

#### 8.1.1 Inspection and maintenance

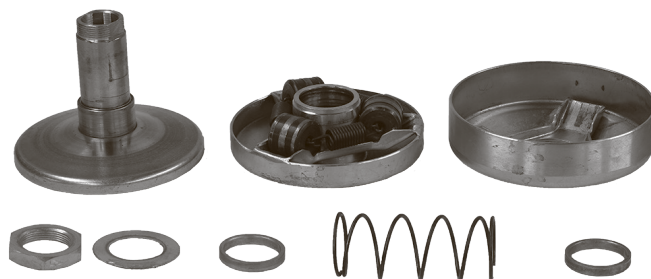
1. Remove the cover from SNOWDOG.
2. Remove the belt from the cvt.



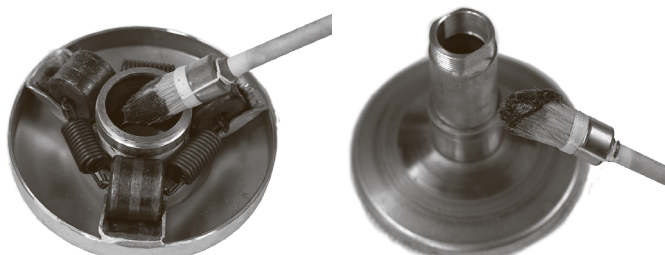
3. Remove the bolt holding the cvt to the crankshaft and remove the cvt.
4. Disassemble the cvt by releasing the lock washer and unscrewing the nut.



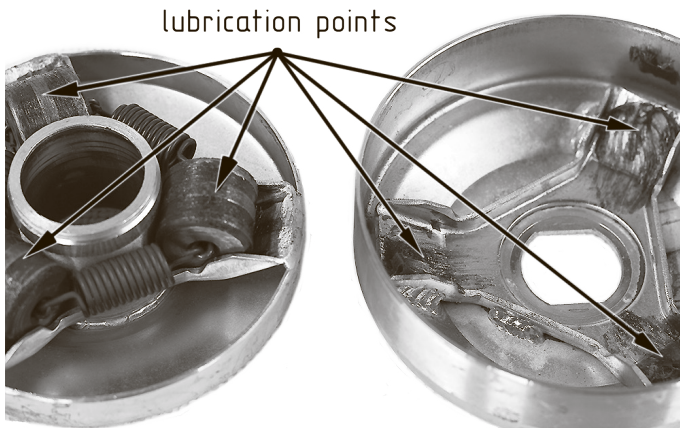
5. Rinse the seats of cvt bushings, rollers and the places of rolling of cvt rollers with gasoline.



6. Lubricate with the ice-free lithium grease (e.g. TEXACO STARPLEX EP 2) the sliding seats on the shaft sleeve and cvt casing.



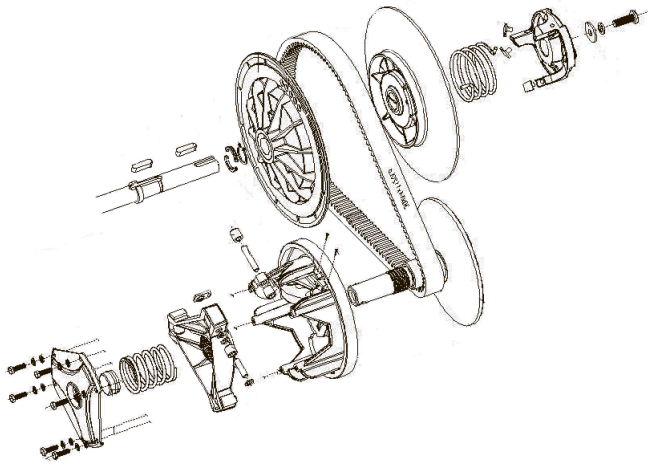
7. Lubricate with the ice-free lithium grease (for example, TEXACO STARPLEX EP 2) rollers and the places of rolling of rollers.



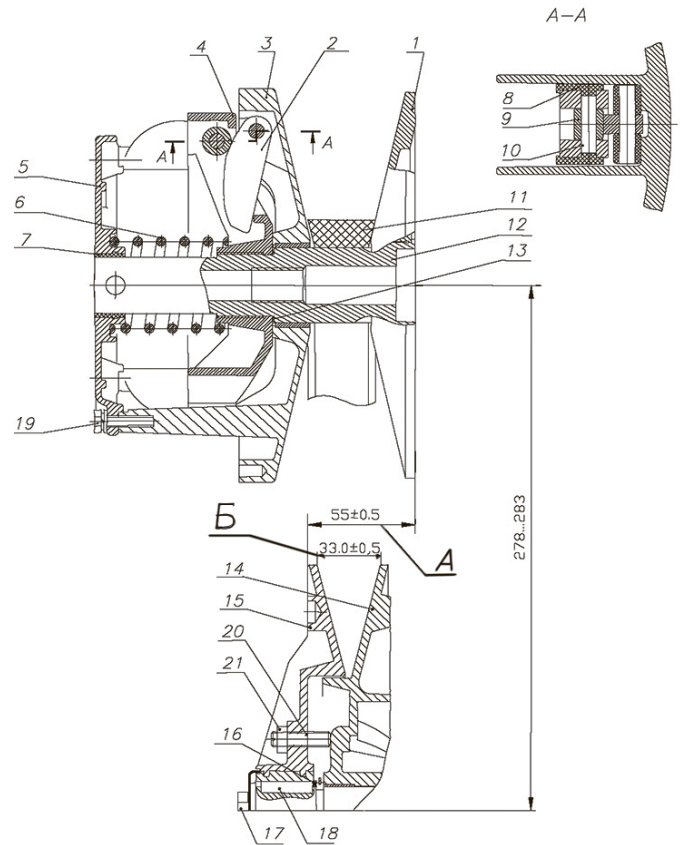
8. Assemble the cvt in the reverse sequence.
9. Set the cvt on the crankshaft of the engine, set the washer and tighten the bolt using the strong fixing thread locker.
10. Set the cvt belt.

**⚠ WARNING**  
**KEEP CLEAN THE WORKING SURFACE OF THE CVT,**  
**IF THERE IS ANY GREASE ON THEM, IMMEDIATELY**  
**CLEAN THEM.**

## 8.2 CVT Safari. Inspection, maintenance, adjustment



### 8.2.1 Design and operation of the CVT drive pulley



#### Cvt components

1. Fixed cone
2. Governor weight
3. Movable cone
4. Stop block
5. Cover
6. Spring
7. Split bushing
8. Insert
9. Roller
10. Axis
11. Belt
12. Shaft
13. Adjustment ring
14. Movable disc
15. Fixed disc
16. Adjustment ring
17. Bolt
18. Key bolt
19. Bolt
20. Adjustment screw
21. Nut



The drive pulley comprises a fixed cone 1 with the shaft 12; a movable cone 3 with governor weights 2 rotating on the axes; stop block 4 with rollers 9, on which the governor weights are moved; a cover 5 and a spring 6 installed between the stop block and the cover. The fixed cone and stop block are connected to the shaft with the right hand thread. The fixed cone of the pulley is put on the crankshaft and fastened with the bolt and washer. It is necessary to fix the bolt with the anaerobic thread-locking adhesive. Be sure to use the key bolt. The spring provides the idling of the cvt as it spreads pulley cones with a decrease in the engine rotational rate or stoppage. In the idling mode, between the belt and the conical surface of the movable cone there should be a gap of 1 to 3 mm, which is regulated by the rings 13 to be installed between the stop block and the shaft projection.

The drive pulley operates as follows, when the adjuster is rotated, the centrifugal force influencing the governor weights tend to rotate them so as to move the movable cone from the stop block and compress the belt in the pulley groove. The centrifugal forces are counteracted by the return spring, the action of which is overcome by the governor weights ranging from 2200 rpm. A further increase in the engine rotational rate results in the seizure by the cones of the belt and increase in its compression and tension forces from zero to the working value sufficient for torque transmission and overcoming the motion resistance force of SNOWDOG.

### 8.2.2 Adjustment, disassembly and assembly of the cvt pulleys

1. Check the distance B between the edges of the cones 15 and 14 of the driven pulley. It should be equal to the belt width of  $\pm 0.5$  mm (see Figure). The correctness of the adjustment can be checked by putting the belt in the groove of the driven pulley, the belt should not protrude over the groove by more than 2 mm. If the belt protrudes over the groove by more than 2 mm, then unscrew the bolt 17 and remove the fixed driven cone with the puller, remove from the shaft the key bolt 18, and then install on the shaft one or two rings 16. Assemble in the reverse sequence. Installing one ring reduces the belt protrusion over the groove by 2 mm.
2. Check the distance A between the ends of the fixed cones of pulleys, it should be  $55 \pm 0.5$  mm. If necessary, adjust the distance by moving the engine in the slots of the engine sub-base.
3. Install the belt on the cvt, engage the neutral speed (if available) or remove the chain. Then rotate the driven pulley repeatedly for the belt to get to the outer diameter of the pulley. Check the belt tension.

### 8.2.3 Maintenance at the end of the operation season

Lubricate the shaft under the split bushing and the bushing of governor weight axes. For lubrication, use the grease of the standard NLGI-2.



At the end of each season or every 100 engine hours (whichever comes first) check the status of bushes on the axes of governor weights and the condition of liners. The wear of the bushes of governor weights can be evaluated by the value of the radial backlash of governor weights. The allowable backlash magnitude is not more than 1 mm. The wear of the inserts can be assessed by the magnitude of the gap between inserts and guide ribs the movable cone. The amount of the allowable gap is not more than 1.5 mm.

**⚠ WARNING**  
**IF THERE IS ANY RUBBER RESIDUE ON THE SHAFT OF THE ADJUSTER, REMOVE THE RESIDUE WITH SOME CLOTH SOAKED IN GASOLINE.**

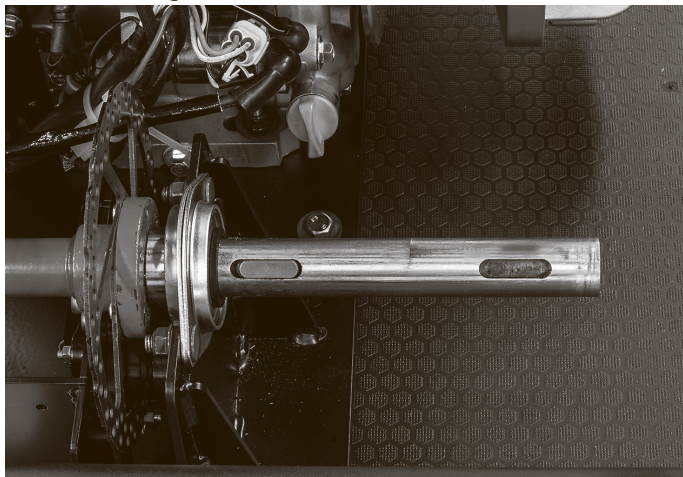
**⚠ WARNING**  
**PREVENT PASSAGE OF GREASE ON THE CONICAL SURFACES OF DISCS.**

**⚠ WARNING**  
**PREVENT PASSAGE OF GASOLINE OR GREASE ON THE CVT BELT.**

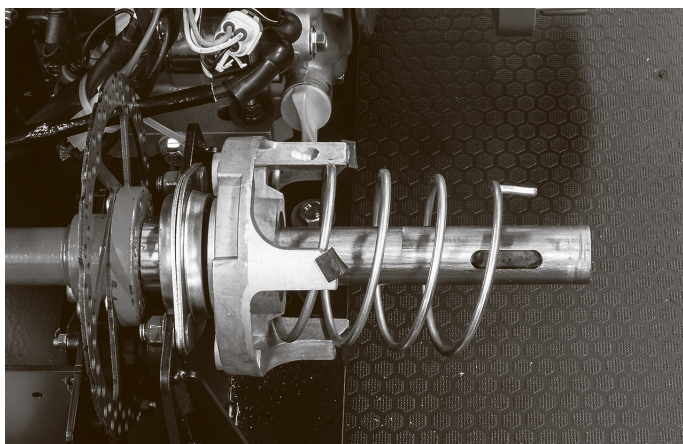
Permissible belt wear is not more than 3 mm, if the wear exceeds the value, it is necessary to replace the belt.

#### 8.2.4 Assembly and disassembly of the driven pulley of the cvt

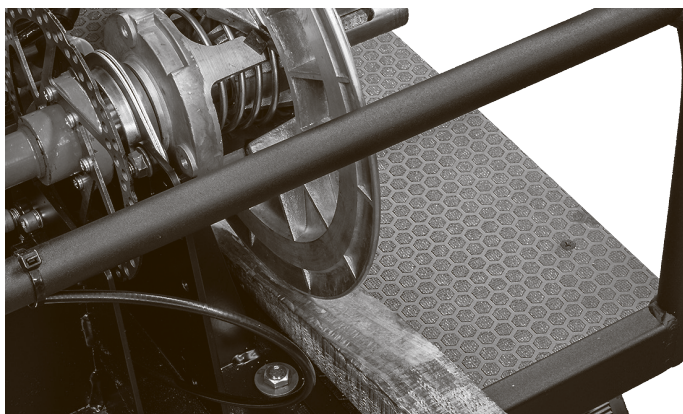
Before assembly of the driven pulley, the shaft should be lubricated with grease.



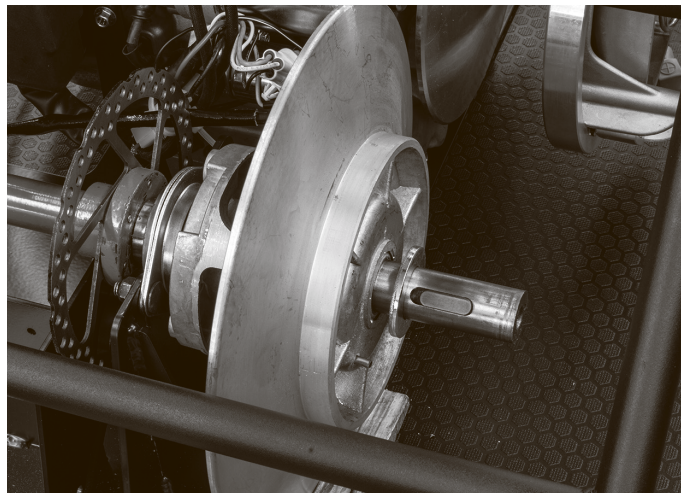
Insert sleeve - for the engine 9 hp - 3 mm, for the engine 15 hp - 3 mm and 20 mm. Then, set the key bolt and coupling half with the spring as shown in the photo.



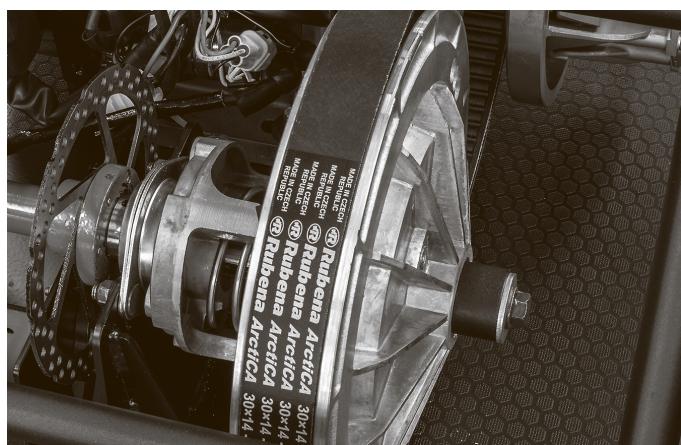
After wearing a movable cvt disc, rotate it clockwise 120° and lock the shaft, for example, with a wooden wedge.



Fix the thrust washer onto the shaft.



Then, set the key bolt and the fixed pulley cone, and for the model with the engine 15 hp set the bushing of 20 mm. Secure with the bolt and a washer.



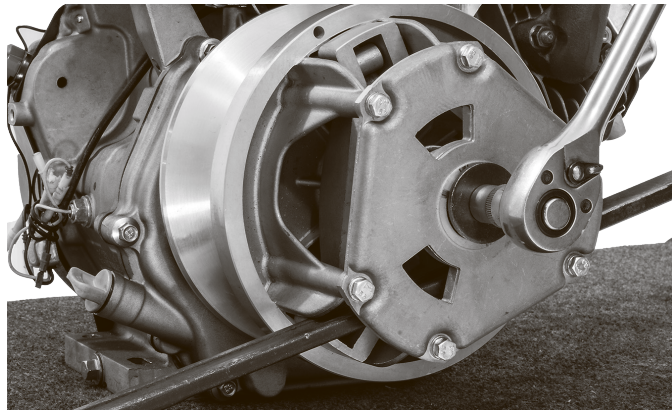
When fastening a bolt, use the anaerobic thread lock. Disassemble in the reverse sequence.



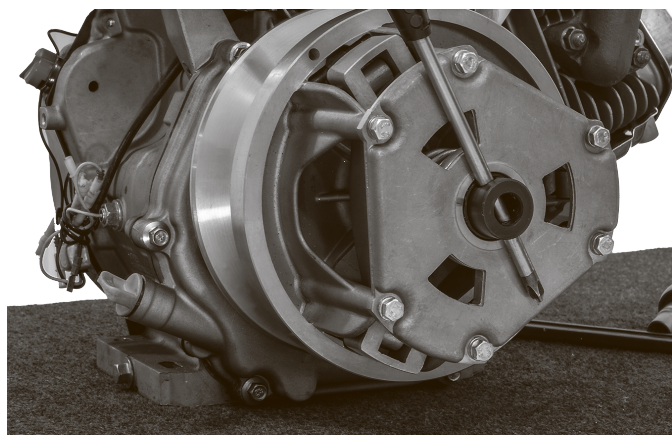
### 8.2.5 Assembly and disassembly of the drive pulley of the cvt

To disassemble the drive pulley, unscrew the bolt holding the pulley.

Unscrew the six bolts securing the cover to the movable cone. In loosening the last two bolts it is necessary to hold the cover to avoid the spring's 'shooting'.

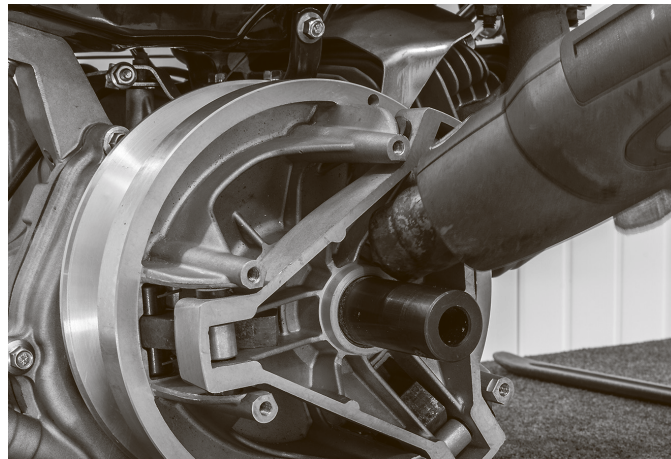


It is convenient to fix cvt models with a hole on the shaft, for example, with a screwdriver.

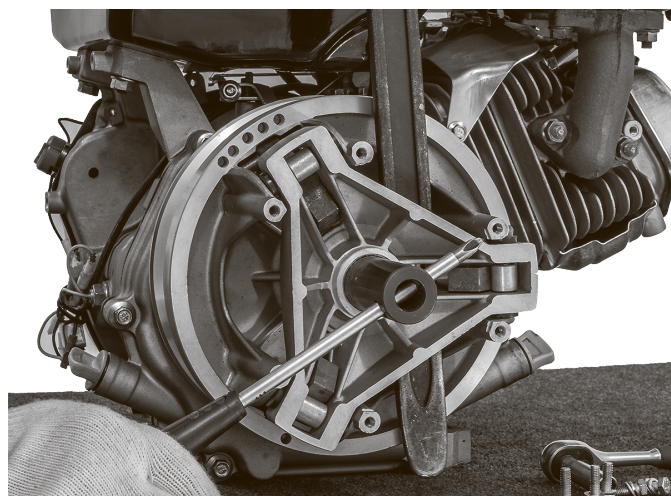


The support is screwed with an anaerobic thread-lock, so before loosening, heat it with a hot air gun.

Unscrew anti-clockwise.



Secure the crankshaft by getting the flywheel locked (or, if the centrifugal adjuster has a mounting hole, use it).



When disassembling the support, remove the inserts, wash axes and rollers in kerosene, lubricate them with grease and assemble the support with new inserts.

Assemble the adjuster in the reverse sequence. The support torque on the shaft 7 to 8 kg/m.

## 9 Reverse gear

### 9.1 Oil change

1. Place under the gear unit case a suitable container for oil collection, then unscrew the oil drain bolt with a washer.

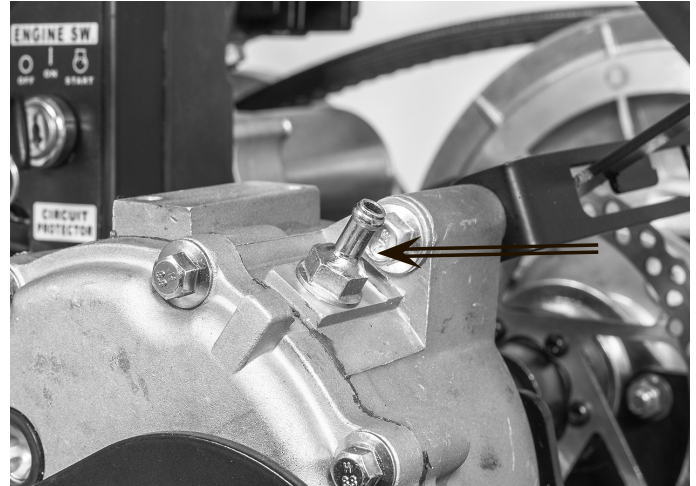


2. Allow the used oil to drain completely, then reinstall the oil drain bolt and a new washer, tighten the bolt of the oil drain with the torque of 21 Nm. .

The oil level in the gear unit is checked by draining and measuring the amount of discharge.

**⚠ WARNING**  
**IT IS RECOMMENDED TO FILL THE REVERSE GEAR WITH THE ENGINE OIL. THE REQUIRED AMOUNT OF OIL IN THE GEAR UNIT IS 200 ML**

3. Unscrew the breather adapter.

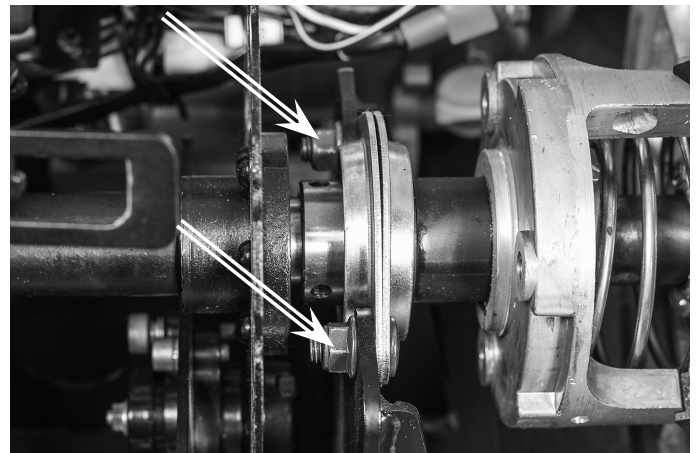


4. Fill with new oil through the breather adapter hole, then screw the breather adapter with the torque of 21 Nm.

### 9.2 Removal, disassembly, assembly and installation of the reverse gear

**✓ NOTE**  
**BEFORE REMOVING THE REVERSE GEAR, FULLY DRAIN IT.**

1. Remove chain protection.
2. Remove chain.
3. Loosen the bearing bolts

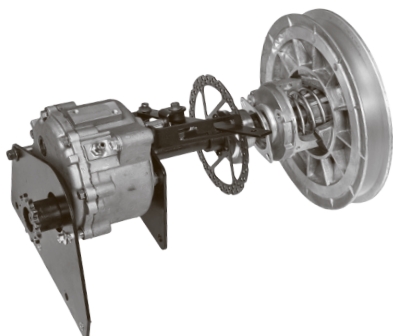




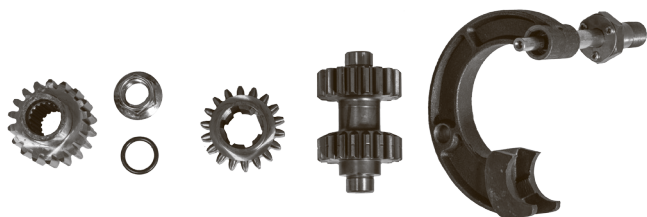
4. Remove the four bolts 1 holding the gear unit mounting brackets to the engine mount.



5. Remove the gear case as assembly with the shaft, brackets the driven pulley of the cvt and the brake disc.



6. Fix the CVT pulley and unscrew the nut holding the drive sprocket. Remove the sprocket.
7. Unscrew the two bolts holding the gear unit mounting bracket.
8. Unscrew the bolts holding the gear unit cover.
9. Remove the gear cover for maintenance.
10. Clean gear parts from dirt and sealant residue.
11. Check the condition of gears, shafts, bearings, seal rings, seals and the guide fork.



12. Replace the defective and worn-out parts.
13. Spread the sealant on the gear case at the interface with the cover.
14. Assemble and install the gear unit.

**⚠ WARNING**  
**WHEN INSTALLING THE COVER OF THE GEAR UNIT, USE A SEALANT.**

Fill the gear unit with oil.

**⚠ WARNING**  
**IT IS RECOMMENDED TO FILL THE REVERSE GEAR WITH THE ENGINE OIL. THE REQUIRED AMOUNT OF OIL IN THE GEAR UNIT IS 200 ML.**

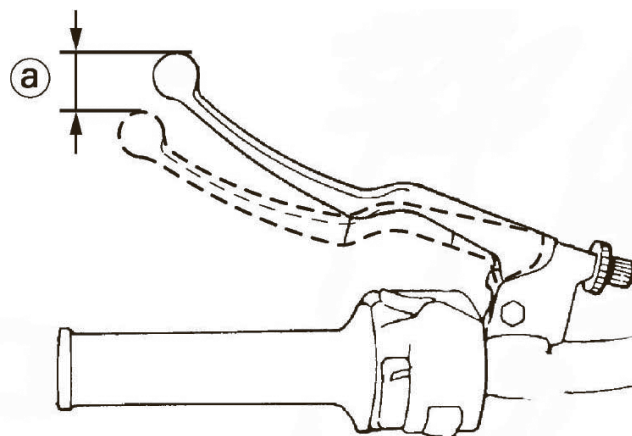
## 10 Parking brake

The parking brake consists of a brake caliper with pads, a brake disc, a drive cable and a brake lever with a lock.

### 10.1 Break gear. Inspection and maintenance

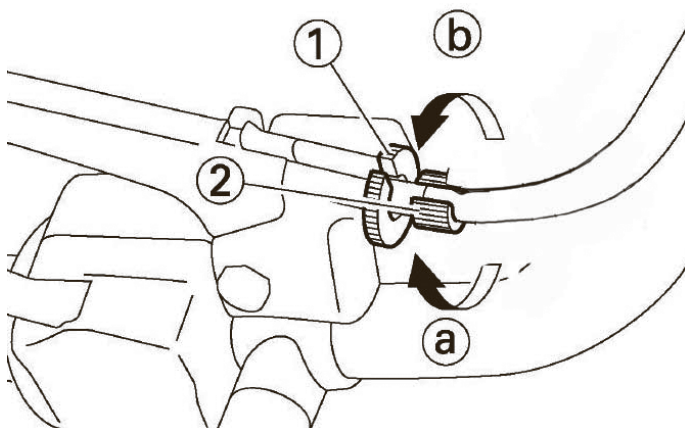
The brake is a combination of a steel disk placed on the shaft of the driven cvt, and a device that presses the disc with brake pads, a caliper. The braking force is transmitted from the brake crank with a cable.

The parking brake is actuated by a lever with a lock located on the left handlebar. Check out the free stroke of the lever, it should be 5-10 mm.



If the braking force on the lever is not enough, for example, when the brake pads are worn-out, or the steel cable is elongated, you need to adjust the brake lever stroke.

To do this, loosen the locknut 1 and by rotating counterclockwise the adjusting screw 2 pull the cable so that the brake lever has a free wheeling in the range of 5-10 mm.



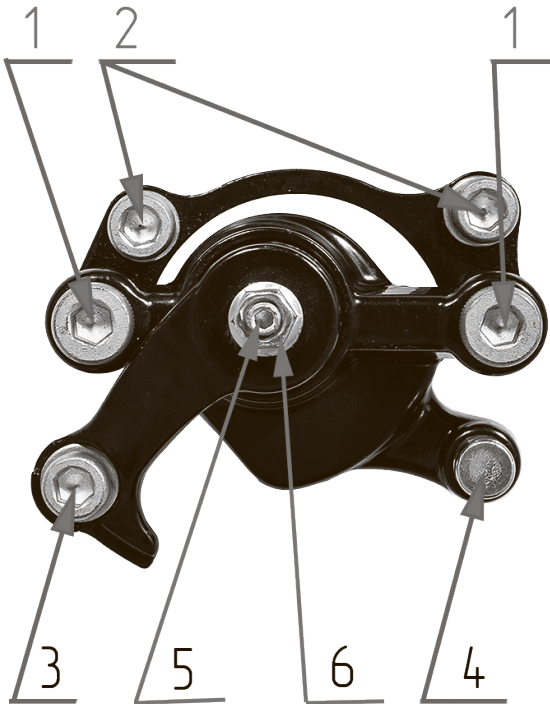
To loosen the brake cable, loosen the locknut 1 and loosen the cable 2 by rotating clockwise the adjustment screw.

If the adjustment on the lever is not enough to adjust the freewheel, adjust the brake caliper and check the condition of the pads.

## 10.2 Brake caliper. Checking, maintenance

Before setting up the caliper, loosen the brake cable as much as possible as specified in **10.1 on page 17**.

To adjust the brake caliper, remove the cover using a cross screwdriver.



### Caliper parts

1. Bolts to adjust the position of the caliper (parallelism of the brake pads in respect of the brake disc)
2. Bolts of fastening the caliper
3. Bolt of fastening the brake cable
4. Stop of the tube guide cable of the brake
5. Bolt to adjust the distance between the pads
6. Lock nut of the adjusting bolt

### 10.2.1 Adjusting the brake caliper

Fully loosen the tension of the brake cable on the lever, as described in. **10.1 on page 17**.

Ensure ease of pushing and return to the starting position of the lever and the parking brake cable.

At the complicated movement of the parking brake lever, lubricate or replace the cable.

If the parking brake lever is in the initial position, and the cable slacks, adjust the tension of the cable on the parking brake caliper. Loosen the bolt 3 and pull the cable to remove slacking. Do not create tension of the cable.

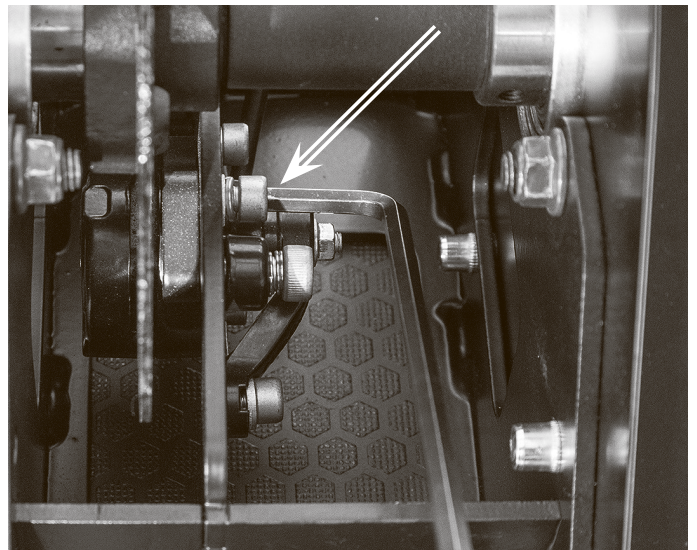
Tighten the bolt and check the operation of the parking brake lever.

By rotating the bolts 1, adjust the position of the caliper relative to the brake disc. The fixed brake pad should be parallel to the brake disc plane. Adjust the minimal possible distance between the fixed brake pads and the brake disc. Allowed is the brake pad's touching the disc, if its rotation is not obstructed.

Loosen the lock nut 5. Tighten the screw 6 until the movable brake pad's touching the brake disc. When holding the bolt 6 tighten the locknut 5. Check the brake disk rotation. Allowed is the brake pads' touching the disc, if its rotation is not obstructed. Check the free travel of the parking brake lever. If necessary, adjust the tension of the cable as described in. **10.1 on page 17**

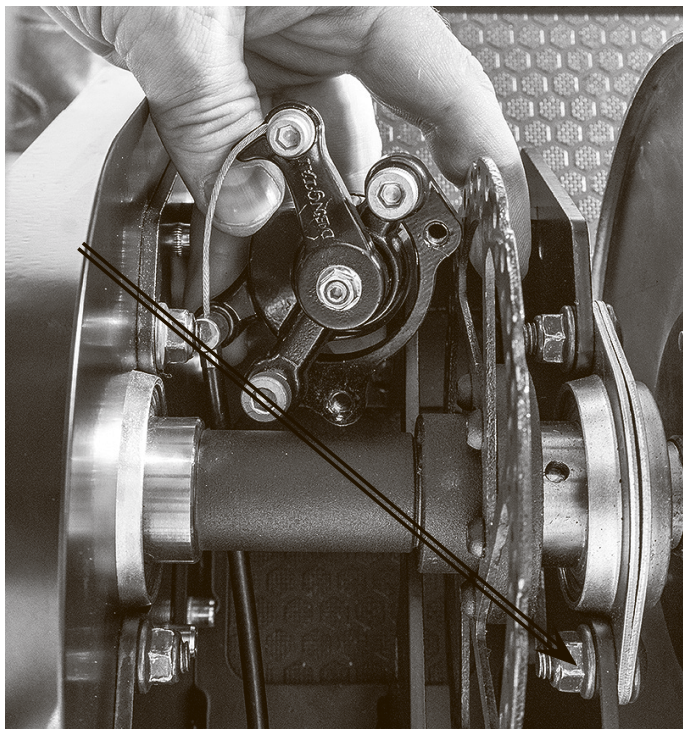
### 10.2.2 Removal and installation of the brake caliper

By using the INBUS allen wrench or another hex slot, unscrew the bolts 2.

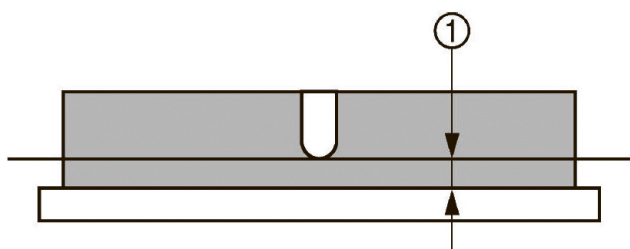




Remove the caliper



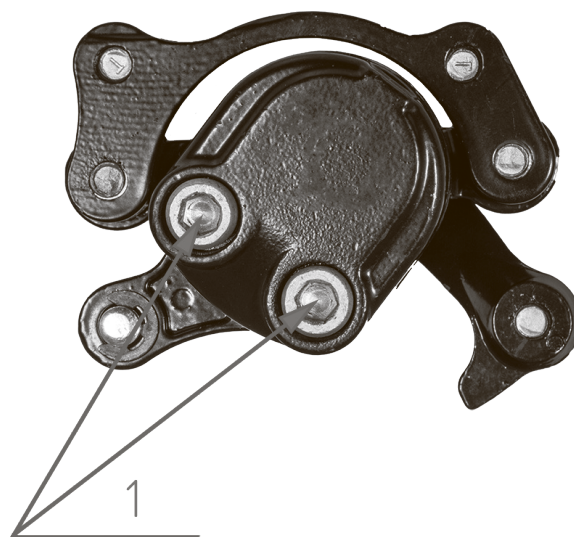
Check the condition of the brake pads. The limit of the thickness (1) of the working material of the brake pads is 0.5 mm. If the brake pads are worn-out, replace them.



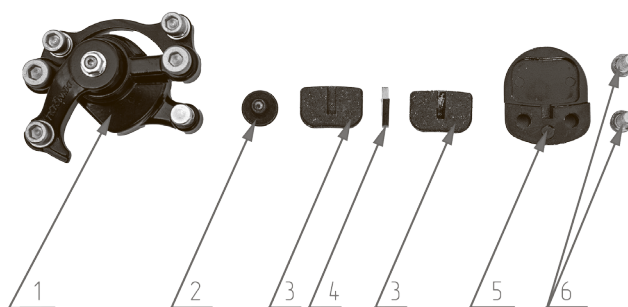
If the brake pads are in order, set and adjust the brake caliper as described in **10.2.1 on page 18**.

### 10.3 Disassembling the caliper

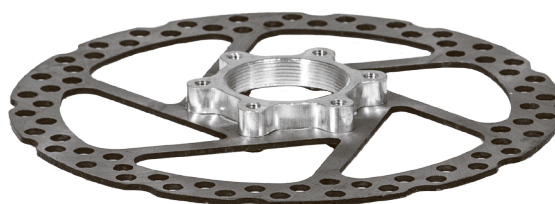
Loosen the bolts 1 and disassemble the caliper.



1. Caliper
2. Stop
3. Brake pad
4. Spring
5. Caliper cover
6. Bolts of the caliper cover



### 10.4 Brake discs. Check, removal, installation



Check the disc without removing from SNOWDOG. The disc should not have any deviations from the plane, signs of overheating in the form of darkening, blueing. Allowed is the brake pads' touching the disc, if its rotation is not obstructed.

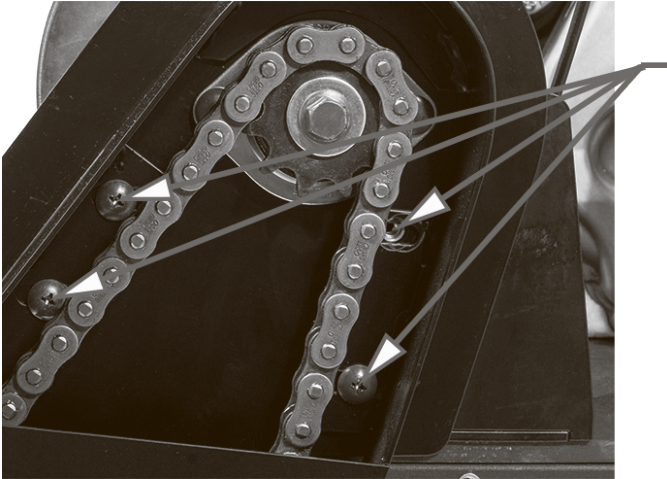
**⚠ WARNING**  
**BE VERY CAREFUL IN WORKING WITH THE PARKING BRAKE. THE ROTATING DISC IS SHARP ENOUGH TO SEVERELY INJUR YOU. THE BRAKE DISC IS HEATED DURING OPERATION AND CAN CAUSE BURN.**



**⚠ WARNING**  
**KEEP THE DISC AND BRAKE PADS FREE FROM OIL OR GREASE. DO NOT TOUCH THE DISC WITH HANDS. REPLACE THE PADS, IF OIL OR LUBRICANT ARE ON THEM. CLEAN THE BRAKE DISC WITH THE AEROSOL CLEANER FOR BRAKES, IF THERE IS ANY OIL OR GREASE ON IT.**

#### 10.4.1 Removal and installation of a brake disc

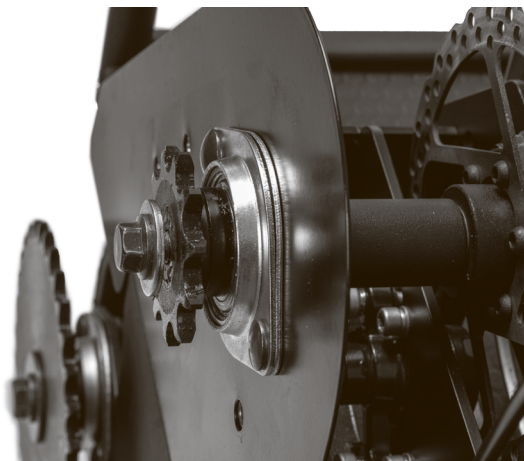
To remove the disc, remove with the screwdriver the four bolts of the chain protection and remove it.



Remove the chain lock and then the chain.



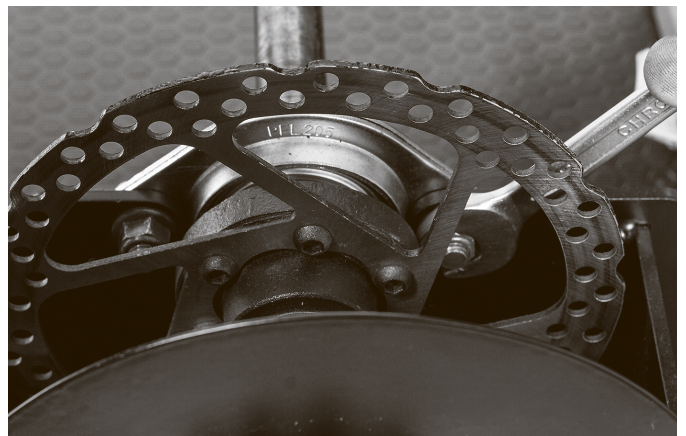
Remove the bolt securing the driving sprocket. Remove the sprocket.



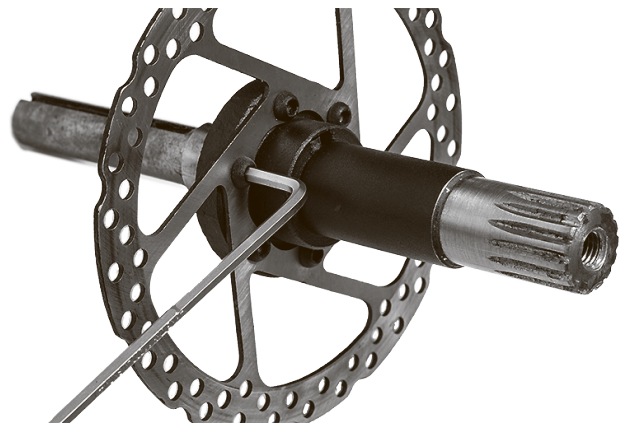
Remove the bolt holding the driven pulley of the cvt. Remove the driven pulley.



Unscrew the bolts holding the cases of the housed self-aligning bearings.



Remove the transmission shaft together with the brake disc. Now it is available for removal of the disc.  
Remove the brake disc by unscrewing the 6 fixing bolts with the IMBUS key of 5 mm.

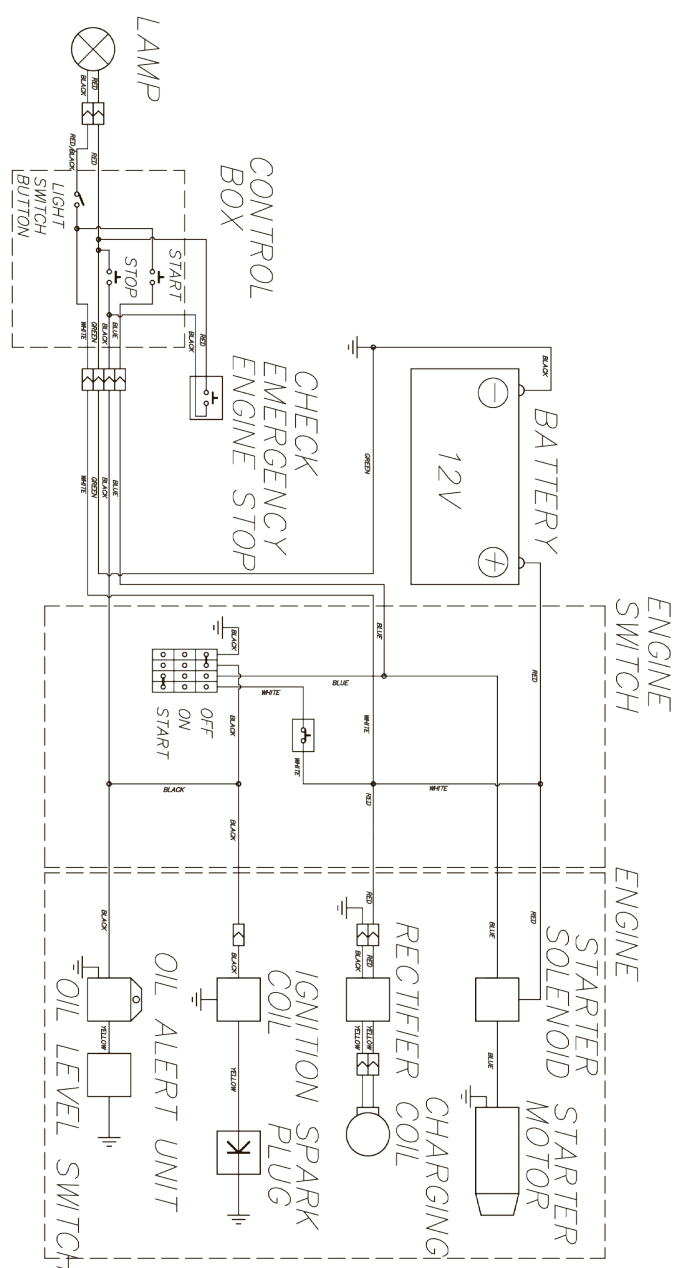


After installing the new disc, assemble everything in the reverse order.

**⚠ WARNING**  
**DURING THE INSTALLATION OF BOLTS USE THE ANAEROBIC THREAD LOCK.**

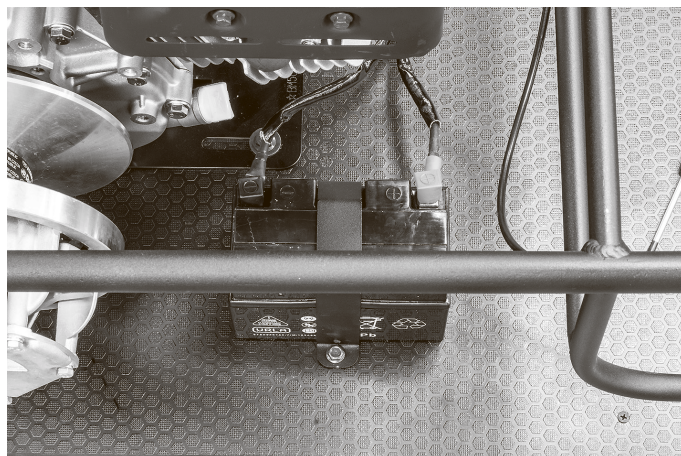
## 11 Electrical system

### 11.1 Circuit diagram



### 11.2 Battery. Inspection and maintenance

Depending on the model, the battery is in a plastic box on the deck of the tow in the middle on the left side of the direction of travel, or is attached with a bracket at the same place.



To check the battery, remove the cover of SNOWDOG.

To check the battery a voltmeter or a multimeter will be needed. Measure the voltage on the battery when the engine is stopped and all power users are turned off (headlights, heated grips etc.). A fault-free battery should show at least 12.4 volts. If the battery voltage is less, it should be recharged.

To check the battery capacity a discharge tester should be used. If you cannot use a discharge tester, contact the battery service center.

Enabling users for a long time in the idling rpm mode can lead to battery discharge.

When you turn off the engine, power users may remain turned on. Therefore, after the engine is off, check all power users. The users, which are on, will discharge the battery and make it impossible to start with the electric starter.

Storage of SNOWDOG with the discharged battery will lead to the battery's going out of order. A fault-free battery has a voltage of at least 12.4 volts. At the end of a journey, it is always necessary to disconnect all energy users, disable the start system, heating the steering grips and headlight.



**⚠ WARNING**  
**WHEN TURNING OFF THE ENGINE, BE SURE TO CHECK WHETHER ENERGY USERS ARE STILL ON.**

**⚠ WARNING**  
**EXPLOSIVE GAS CAN RELEASE FROM THE BATTERY. DO NOT SMOKE NEARBY, DO NOT ALLOW SPARKS OR OPEN FLAME.**

When using or charging the battery in a room, provide good ventilation.

The composition of the electrolyte includes sulfuric acid, which in contact with skin or eyes causes severe burns. When working, be careful and use safety gloves and a mask.

**⚠ WARNING**  
**IN CASE OF CONTACT OF ELECTROLYTE WITH SKIN RINSE IT WITH A HIGH AMOUNT OF WATER.**

**⚠ WARNING**  
**IN CASE OF CONTACT OF ELECTROLYTE WITH EYES RINSE IT WITH CLEAN WATER DURING AT LEAST 15 MINUTES, OBTAIN MEDICAL ATTENTION WITHOUT DELAY.**

**⚠ ELECTROLYTE IS TOXIC! IF YOU ACCIDENTALLY SWALLOW ELECTROLYTE, OBTAIN MEDICAL ATTENTION WITHOUT DELAY**

**⚠ WARNING**  
**KEEP THE BATTERY OUT OF REACH OF CHILDREN.**

**⚠ WARNING**  
**DO NOT CONFUSE THE POLARITY OF THE BATTERY. THIS WILL RESULT IN SHORT-CIRCUIT AND DAMAGE TO THE BATTERY OF SNOWDOG.**

### **11.3 Emergency engine switch, checking**

In the middle of the steering wheel there is an emergency button for engine shutdown (KILL SWITCH), which consists of a cotter key and a button.



The driver of SNOWDOG should always be operate with a cotter key on his/her arm. If during movement the driver leaves SNOWDOG, the cotter key falls from the button thereby stopping the engine:

1. Set the brake in the parking mode.
2. Start the engine.
3. Remove the cotter key. If the engine stalls for 3 seconds, then everything is in good order

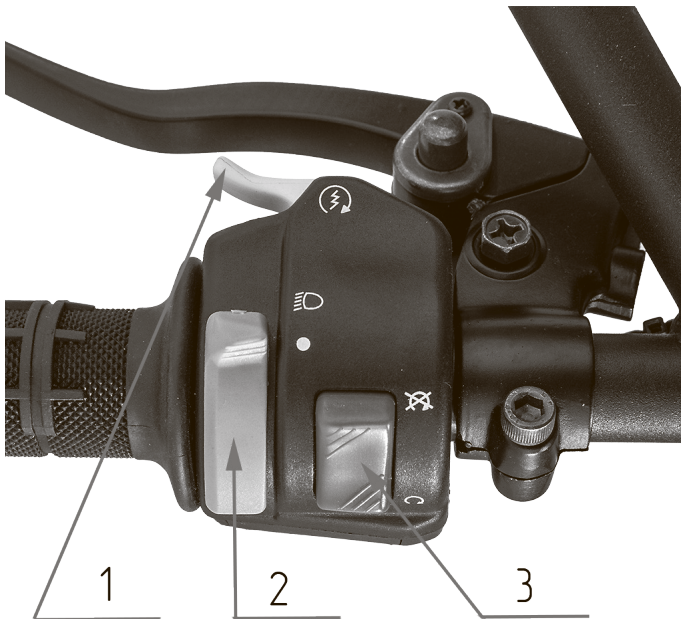
If the engine fails to stall and continues to operate, you should check the button pileup.

If operation is unstable, replace the button.

## 11.4 Steering switch, checking

Check the steering switch for cracks, chips and other damage. If there are any cracks, chips replace the switch.

### Steering switch components:



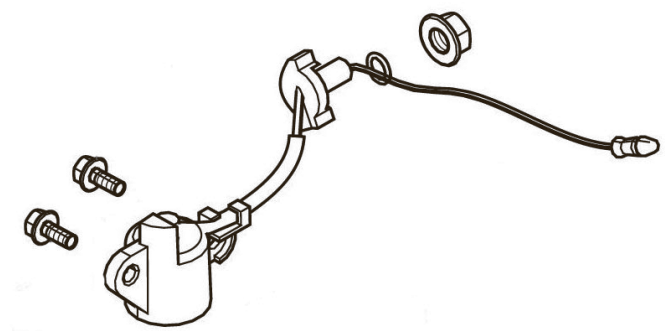
1. The electric starter switch button. If the button is pressed, the electric starter operates, and the engine can be started. Do not hold the button for more than 5 seconds.
2. Headlight switch.  
If the switch is in the push off position, the headlight is on.  
If the switch is in the pull position, the headlight is off.
3. Starting on/off switch.  
When the switch is in the pull position, the ignition is switched on. The engine can be started.  
If the switch is in the push off position, the ignition is off. The engine cannot be started.

## 11.5 Headlight, inspection, replacement

LED light does not have replaceable parts. If LED light is connected, but does not turn on - replace the LED light.



## 11.6 Engine protection by oil protection



The equipment package of some engines includes the oil level control system.

In the fall of level of engine oil in the engine case to the minimum level, the system connects to the ground the primary circuit of the ignition coil thereby blocking the operation of the engine.

☑ **NOTE**  
**THE PROTECTION SYSTEM MAY TRIGGER AT THE CRITICAL ANGLES OF GRADIENT OF SNOWDOG, FOR EXAMPLE, WHEN CLIMBING UP STEEP SLOPES OR MOVING INCLINED.**

Check the engine protection system for oil level as follows:

1. Check the engine oil level, top up if necessary.
2. Set the brake in parking position.
3. Start the engine, warm it up.
4. Disconnect the yellow wire and connect it to the frame. The engine should stall.

☑ **NOTE**  
**IF THE ENGINE IS NOT STALLED, CHECK THE ELECTRICAL CIRCUIT FROM THE OIL LEVEL SENSOR TO THE IGNITION COIL.**

## 11.7 Removing and installing the engine

To remove the engine, do the following:

1. Remove the cover from SNOWDOG.
2. Remove the cvt belt.
3. Remove the leading CVT pulley (regulator)
4. Disconnect all electrical wires.
5. After removing the air filter, remove the drive throttle cable.
6. Remove the four bolts that hold the engine to the frame.
7. Remove the engine.
8. To install the engine, make all the steps in the reverse order. Screw the engine to the frame with bolts at a torque of 15 Nm.

## 12 Maintenance

### 12.1 After the first 5 hours of SNOWDOG operation

1. Maintain the engine according to the engine manual.
2. Lubricate the throttle and parking brake cables with the silicone oil.
3. Lubricate the chain and drive sprockets (chain care aerosol).
4. Adjust the free travel of the throttle lever arm and parking brake (5 - 7 mm).
5. Adjust the chain tension.
6. Check the transmission bearings.
7. Check tightening of all the bolts of the side plate and chain sprockets.

**Table 12.1**

Wrench size, mm	Thread diameter, mm	Torque, Nm
10	6	5
12, 13, 14	8	15
14, 15, 17	10	30
17, 19	12	55
19	14	85
22	16	130

### 12.2 Maintenance every 20 hours of operation

1. Maintain the engine according to the engine manual.
2. Change the oil in the gear unit (if available in the design of SNOWDOG).
3. Lubricate the throttle cable of the parking brake with the silicone oil.
4. Lubricate the chain and drive sprockets (chain care aerosol).
5. Check the transmission bearings.
6. Adjust the free travel of the throttle lever arm and parking brake (5 - 7 mm).
7. Adjust the chain tension.
8. Check tightening of all the bolts of the side plate and chain sprockets.

See torque in **12.1 on page 24**.

## 13 Storage

SNOWDOG should be stored in a dry ventilated room or outdoors under a canopy. SNOWDOG should be protected from the direct sunlight.

 **NOTE**  
**MAKE SURE THAT THERE IS NO HIGH HUMIDITY OR DUST IN THE STORAGE ROOM.**

### 13.1 Preparation for storage

1. Maintain the engine according to the engine manual.
2. Clean or wash SNOWDOG.
3. Lubricate the throttle and parking brake cables with the silicone oil.
4. Lubricate the chain and drive sprockets (chain care aerosol).
5. Adjust the free travel of the throttle lever arm and parking brake (5 - 7 mm).
6. Adjust the chain tension.
7. Check tightening of all the bolts of the side plate and chain sprockets.

See torque in **Table 12.1 on page 24**.

8. Remove the battery and charge it. Store the battery in a room with temperature control from +1 °C to +20 °C.

9. Check charging not less than once every two months.
10. Put SNOWDOG on supports for the track to hang in the air.
11. Rotate the track half a turn not less than once every six months
12. Cover SNOWDOG against dust with a vapor-permeable fabric.

The preservation ensures that SNOWDOG can be preserved for up to 12 months, subject to storage rules. At the end of 12 months to prepare SNOWDOG for operation, start the engine for a few minutes. If necessary, carry out further preparation for storage again.

### 13.2 Preparing for operation after seasonal storage (depreservation)

Before using after prolonged storage, perform the following procedures:

1. Clean SNOWDOG from dust, dirt.
2. Maintain the engine according to the engine manual.
3. Charge the battery.
4. Lubricate the throttle and parking brake cables with the silicone oil.
5. Lubricate the chain and drive sprockets (chain care aerosol).
6. Adjust the free travel of the throttle lever arm and parking brake (5 - 7 mm).
7. Adjust the chain tension.
8. Check tightening of all the bolts of the side plate and chain sprockets.
9. Change the oil in the gear unit (if available in the design of SNOWDOG).



## 14 Frequency of maintenance of SNOWDOG

	Before each operation	After operation	After the first 5 hours of operation***	In the complicated operating conditions***	In harsh operating conditions **	Preparation for storage (preservation)***	During storage	Preparing for operation after storage (depreservation)***	Preparation for transport	Maintenance after transportation
Fuel	M					M		R	M	M
Operation of the electric starter*			C	C						
Operation of the mechanical starter			C	C	C					
Tickover	C		C	C	C					
Engine reaction to the throttle lever arm position	C		C	C						
Unusual sounds with the engine running	C		C	C	C					
Travel of the throttle lever arm	C		M	M						
Cleaning the carburetor controls from snow		M			M					
Lubrication of the throttle cable			M	M	M	M		M		
Travel of the parking brake lever arm	C		M	M						
Air filter*			M	M	M			M		
Fuel valve*	C		C	C		C			C	C
Oil in engine	C		R	R		R				
Reverse movement gear oil*			C	R		R		C		
Transmission shift of the reverse movement gear*	C		C							
Leakage of process fluids	C	C	C	C			C			
Emergency engine switch (cotter key)	C									
Steering switch	C									
Steering wheel and its mounting	C		C	C	C					
CVT pulleys*			C	M	M			M		
Cvt belt*			C	C						
Chain	C	M	M	M	M	M		M		
Chain transmission sprockets		C	C	C						
Fixing sprockets		C	M	M	M			M		
Battery*	C	C	M	M		M	M	M		
Battery wires*			C	C				C	M	M
Charging*			C	C				C		
Headlight*	C	C	C	C						
Cover*	C				M					
Caliper and parking brake pads			C	C	C					
Parking brake disc			C	C	C					
Lubrication of the parking brake cable			C	M	M	M		M		
Track		C	M	M		M	M	M		
Track shafts		C			C					
Suspension bogies		C	C	C	C					
Cleaning from dirt or snow		O			O	O		O		

	Before each operation	After operation	After the first 5 hours of operation***	In the complicated operating conditions***	In harsh operating conditions **	Preparation for storage (preservation)***	During storage	Preparing for operation after storage (depreservation)***	Preparation for transport	Maintenance after transportation
Fixing the trailer	C	C	M	M	M					
Fixing side plates			M	M	M					
Fixing suspension bogies			M	M	M					
Fixing bearing wheels*			M	M	C					
Fixing the engine			M	M	C					
Fixing the gear unit*			C	C						
Fixing the cvt bracket*			M	M	C					
Fixing the engine mount*			M	M						
Transmission shaft bearings		C	C	C	C					
Bogie bearings		C	M	M	R					

C - checking; M - maintenance; R – replacement

\* Not for all models and complete sets of SNOWDOG

\*\* The complicated operating conditions are described in Chapter **15 on page 25** of the Manual

\*\*\* to be performed by the dealer

## 15 Complicated operating conditions

The complicated operating conditions include:

1. Movement on the deep loose snow (with the depth of more than 40 cm).
2. Movement on wet snow, the snow containing water.
3. Movement on surfaces flooded with water.
4. Movement on the rocky terrain.
5. Driving on ice crust, which cannot withstand the weight of SNOWDOG and sleigh.
6. Participation in races and competitions.
7. Long movement at low speed "tight".
8. Movement in excess of the allowable loads.
9. Long movement uphill, downhill, on the slopes.
10. Short journeys with frequent stops.

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