



STREAMER
Premium Shotblasters

Operating Manual
S320RD



Your Partner for Mobile Surface Preparation
IMPACTSAmericas.com



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For **spare parts**, please refer to a separate publication called "S320RD Parts Catalog."



Please note: The following safety instructions must be followed as shown in this operating manual. Failure to do so may result in hazard to health or possible death.

Chapter 1.0 Technical Data

- 1.1 Rating
- 1.2 Unit Specifications
- 1.3 Operative Range and Correct Usage
- 1.4 Advice for L.P. (Propane) Gas Mode
- 1.5 Advice for Operators of the Blast Machine
- 1.6 Machine Type Designation

1.1 Rating

Machine: IMPACTS Blast Machine
 Machine-Type: S320RD
 Manufacturer: IMPACTS Americas
 1384 Bungalow Rd.
 Morris, IL 60450 U.S.A.

1.2 Unit Specifications

	<i>Machine S320RD</i>
Length	81 in. / 2060 mm
Width	34 in. / 864 mm
Height	60 in. / 1520 mm
Weight	1,808 lb. / 820 kg

Engine Kawasaki:

Model	FD750D
Engine Type	Liquid-cooled, 4-cycle
Number of Cylinders	2
Displacement	745 cm ³
Max. Power	17.7 kW (23.7 HP) / 3600 min ⁻¹

Consumables:

	Capacity (l)	Type
Engine Oil	2.0	SAE 10W40 SF, SG, SH or SJ Semi synthetical
Coolant	2.7	e.g. Antifreeze X12 Plus Mixed ratio: 50%
Hydraulic Oil	20	HLP46
Compressor Oil	0.5	API CC/SC SAE40
Gear Box Oil	0.36	e.g. Shell Omala S2 G 150

1.3 Operative Range and Correct Usage



The blast machine is designed to be used on clean, dry, horizontal surfaces without any obstacles. The machine cannot be used for any other purpose. The manufacturer will not be held liable for damages resulting from incorrect usage. In cases of wrong usage, the user will assume all risks and damages.

1.4 Advice for L.P. (Propane) Gas Mode



Settings or repairs of the L.P. Gas system must only be performed by a specialist. If there is any gas smell or leak, the Blastmachine must be taken out of operation at once and the tank shut-off valve must be closed. The Blastmachine must only be taken in operation again after the cause has been found and removed by a specialist.

L.P. Gas system components, specifically gas lines, must not come into contact with sharp-edged, hot or rotating parts. Lines must not be bent. The Blastmachine must be inspected every day, specifically for tightness and tight seat of the gas components.

1.5 Advice for Operators of the Blast Machine



During the operation of the machine, it may be possible to exceed the acceptable noise levels of 85 dB(A). This is dependent on various locations and circumstances. When the noise level is 85 dB(A) or more, the machine operator and the persons working near the machine must wear sound-insulating devices.

1.6 Machine Type Designation

Machine Type:	S320RD
Unit / Designation:	IMPACTS Blast Machine
Working Width:	12.6 in. 320 mm
Drive:	Progressively adjustable 1-98 ft/min 0-30 m/min
Blasting Capacity:	Up to 2,153 SF/hr 200 m ² /h
Abrasive Consumption:	100-200 g/m ²

Chapter 2.0 Safety Instructions

- 2.1 Explanation of Warnings and Symbols
- 2.2 Organizational Measures
- 2.3 Personnel Selection and Qualification
- 2.4 Safety Precautions Applicable to Different Operating Conditions
- 2.5 Repair Work, Maintenance Activities, and Default Repair on the Job Site
- 2.6 Definition of the Safety Off Position
- 2.7 Dangerous Aspects of the Machine
- 2.8 Electrical Engineering Regulations
- 2.9 L.P. Gas Engineering Regulations
- 2.10 For Special Attention

2.1 Explanation of Warnings and Symbols

The following symbols are used in the operating instructions to highlight areas of particular importance:



Operational Safety

This symbol will be shown in these Operating Instructions next to all safety precautions that are to be taken in order to ensure prevention of injury. Follow these instructions and take special care in these circumstances. In addition to these instructions, the general safety precautions and the local accident prevention guidelines also should be followed. Please check if there are special regulations for the particular job site.



Safety Goggles/ Ear Protection

Information, instructions, and restrictions with regards to possible risks of personal injury or extensive damage to materials.



Electrical Warning

Warning against dangerous voltages.



Propane Gas Warning

Warning against dangerous aspects of the propane gas system.

2.2 Organizational Measures



Operating Instructions are to be kept near the machine and be attainable all the time.

In addition to the Operating Instructions, general and legal regulations regarding accident prevention and environmental protection must be indicated every time.

Such duties may, for example, relate to the handling of hazardous substances or to the provision and wearing of personal protection equipment as well as compliance with local traffic regulations.

The Operating Instructions must be supplemented by instructions including the duty to supervise and report relating to particular local working practices; for example, work organization, work procedures, and personnel allocation.

Personnel working with the machine must read the Operating Instructions before starting the work, in particular. Chapter 2 "Safety Instructions." This must be done before starting any work with the machine. This applies to certain activities such as setting up the machine, carrying out maintenance work, or training staff to work with the machine.

From time to time, the working practices of the staff should be checked regarding awareness of safety and hazards.



Personnel must tie back long hair and not wear loose clothing or any jewelry. There is risk of injury in getting stuck or being drawn into moving machinery. Use personal protection equipment whenever necessary and required by regulations!

Take notice of all safety and hazard signs on the machine. They must be kept complete and legible.



If safety-critical changes occur to the machine or its performance, the machine must be shut down immediately! The cause of the fault must be determined immediately and be repaired before starting work again.

Changes, add-ons, or conversions which might have an influence to the safety of the machine must not be undertaken without the permission of the manufacturer. This applies in particular to the fitting and adjustment of safety devices and to welding on major and load bearing parts.

Spare parts must always comply with the technical requirements and the specification of the manufacturer. Original spare parts by the manufacturer are guaranteed compliant.

Inspection intervals and intervals for recurring checks specified in these Operating Instructions must be followed. At the same time, it is necessary to meet all legal requirements. To perform maintenance work correctly, it is important to be equipped with proper tools for the task in question.

The location and the operation of fire extinguishers must be made known at each job site. Take note of the facilities for fire reporting and fighting fires!

2.3 Personnel Selection and Qualification

Fundamental Duties



*Only trained personnel can operate and perform work on the machine. **Note the statutory minimum age!** Clearly specify the responsibilities of personnel for operation, setup, service, and maintenance work.*

Clearly define the machine operator's responsibilities regarding traffic safety regulations and empower him/her to decline instructions from third parties who are not complying with the safety requirements.

Personnel being trained or individuals testing the equipment must always be supervised by an experienced operator.



Work on the electrical parts of the equipment may only be undertaken by a skilled electrician or by a trained person under the guidance and supervision of a skilled electrician in accordance with the electrical engineering regulations.



Work on the L.P. Gas system may only be undertaken by a specialist, as well as in accordance with the L.P. Gas system regulations for L.P. Gas driven vehicles.

2.4 Safety Precautions Applicable to Different Operating Conditions

Avoid any method of working that impairs safety! All precautions have to be taken. The machine must only be used in a safe and functional condition.



Only operate the machine when all safety devices and related safety equipment, e.g. detachable safety devices, emergency stops, and suction devices, are present and operational!

The machine has to be checked visually at least once a day for any damage and defects.

In the event of operational malfunctions the machine must be shut down immediately and secured. The error must be rectified before starting the machine again.



Secure the work area around the machine in public areas providing a safety distance of at least 7 ft./ 2m around the machine.

Default must be rectified immediately!

Start up / switch off operations and control devices have to be handled in accordance with the Operating Instructions.



All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. Ear protection may be required. The operator is required to wear close fitting protective clothing.

Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine following valid VDE and local guidelines.

Before starting the machine ensure that no person in the job site can be endangered when the machine starts running.



Do not switch off or remove the exhaust and ventilation devices when the machine is running!

2.5 Repair Work, Maintenance Activities, and Default Repair on the Job Site

Mechanical Service Work



These activities can only be undertaken by qualified personnel. Please follow any special safety instructions in the various chapters on servicing the machine (see Chapter 7).

Before starting any servicing work on the machine, put the machine in the Safety off position (as described in Chapter 2) in order to prevent the machine from being switched on accidentally.

Adjustments, servicing, and inspection work and inspection intervals specified in these Operating Instructions as well as any information on the replacement on parts and systems of the machine must be undertaken and/or complied with.

The operator must be informed of any maintenance or repair work done to the machine.

Startup and shut off procedures must be done in accordance with the Operating Instructions during all work related to the use, repair, and adjustment of the machine. The repair personnel must also be aware of the safety devices during inspection, maintenance, and repair.



The machine must be shut off completely for repair or maintenance work. Please remove the ignition key from ignition/starter-switch in order to prevent the machine from being switched on accidentally.

The integrated dust collector bin must be emptied before transportation. Please handle in accordance with the regulation how to dispose the dust and make sure that you meet the local regulations. Do not use any aggressive cleaning materials! Use only lint-free cleaning cloths.

Always remember to tighten any screw connections that are undone during servicing and maintenance work!

If safety devices need to be dismantled during setting up, servicing, or repair work, these safety devices must be reinstalled and inspected immediately after completion of the service.

Make sure that process materials and replacement parts are disposed of safely and in an environmentally-friendly manner.



Welding operations: To prevent any damage to electric or electronic components, disconnect the battery and alternator before any welding operations are undertaken.

Make sure that electrical components used for replacement purpose comply with the original parts and are correctly adjusted if necessary.

2.6 Definition of the Safety Off Position

The safety off position is the position of the machine when it cannot generate any hazard. Setting the machine in the safety off position means:

1. Switch off the blast machine.
2. Wait for standstill of all drives.
3. Remove the ignition key.
4. Close the shut-off valve of the fuel or L.P. Gas system.
5. Secure the machine against accidental start up.

2.7 Dangerous Aspects of the Machine



Every machine not used according to the regulations may be hazardous for personnel during operating, setting-up, and service. The operating authority is responsible for compliance with the safety regulations during operation and maintenance of safety devices supplied with the machine as well as the provision of appropriate additional safety devices.



Exhaust emissions: Only operate the machine in well ventilated areas. Operating the machine in confined areas may lead to build up of harmful exhaust emissions, which may cause dizziness, drowsiness or even death!

	<p>Danger of injury!</p> <p>Abrasive leaves housing with high speed! (A)</p> <p>Moving parts! Lift the machine only when the abrasive control valve is closed .</p> <p>↑ Be careful when lower the machine, crushing hazard. ↓ (B)</p> <p>Steering: At swivelling movement, hazard. ←→ (C)</p> <p>Engine (D): Danger of burning at hot motor and exhaust parts.</p> <p>It is not allowed to stay within the working radius of the machine.</p>
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2.8 Electrical Engineering Regulations



Work on the electrical parts of the equipment may only be undertaken by a skilled electrician or by a trained person under the guidance and supervision of a skilled electrician in accordance with the electrical engineering regulations.



Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine following valid VDE and local guidelines. In case there is any question, ask the manufacturer or a skilled electrician.

Only start work once you are familiar with the electrical engineering regulations that apply to your area.

Only use voltage seekers that comply with the regulations when troubleshooting. From time to time, check voltage seekers to ensure that they are operationally efficient.

2.9 L.P. Gas Engineering Regulations

Regarding setup and operation, vehicles with a liquid gas combustion motor are subject to the "common provisions" as well as the "special provisions" according to § 29 UVV "Use of liquid gas" (BGV D34).

Inspection of vehicles with liquid gas combustion motor by the expert according to §§ 33 and 37 UVV "Use of liquid gas" (BGV D34).

2.10 For Special Attention

Use only proper and default free tools for your work. Damaged tools have to be repaired immediately or be replaced.

Use safety equipment and clothing (e.g. safety glasses, safety shoes, safety gloves) during operation of the machine at all times for your safety.

Please instruct your operators and the repair personnel about the following points:

- Greasing, cleaning, and all repair work is only allowed if the machine is in the safety off position (see Section 2.6).
- No one is allowed to open or remove safety covers while the machine is running.
- Replace all safety covers and safety devices after cleaning, repair, and maintenance work.
- Do not touch moving parts or walk into the working path of the machine.
- Before start up of the machine after any cleaning, repair, or maintenance work, ensure that no person in the working area could be endangered by the machine.

Chapter 3.0 General Information

- 3.1 Operative Range**
- 3.2 Scope of Supply**
- 3.3 Description of the Machine**
- 3.4 Operating Elements**
- 3.5 The Wheel Kit**
- 3.6 The Separator**
- 3.7 The Traction Drive**
- 3.8 The Base Seals**
- 3.9 The Filter Housing**
- 3.10 The Dust Bin and Lifting System**
- 3.11 The Fan**
- 3.12 The Automatic Cleaning System**
- 3.13 Abrasive Media**
- 3.14 Selecting Abrasive Media**
- 3.15 Care and Maintenance**

3.1 Operative Range

The IMPACTS blast-cleaning machine S320RD is a downward blasting machine with a closed abrasive circuit designed for the pre-treatment of horizontal surfaces. The bouncing impact of metallic abrasive onto the surface thoroughly removes surface contaminants, coats of paint, sealants, and thin coatings.

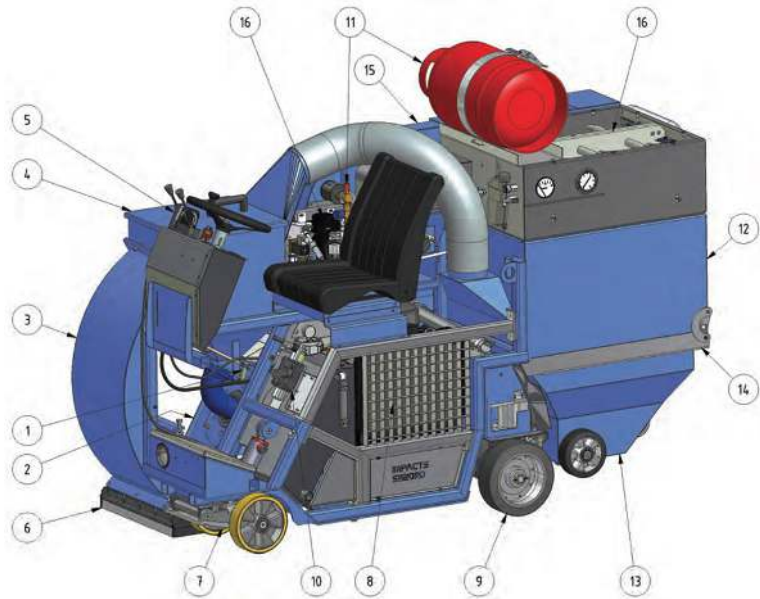
A suitable filter unit is integrated into the machine in order to separate the dust from the abrasive. A specially designed dust collection system ensures dust-free operation of the machine and clean air at the workspace.

3.2 Scope of Supply

- Blast Machine (S320RD)
- Manual (1)
- Maintenance Box (optional)
- Magnetic Broom (optional)

3.3 Description of the Machine

- | | |
|----|--------------------------------------|
| 1 | Abrasive Feeding |
| 2 | Side Force Wheel Housing |
| 3 | Rebound |
| 4 | Separator |
| 5 | Controls |
| 6 | Base Seal |
| 7 | Height Adjustment / Lifting Cylinder |
| 8 | Motor |
| 9 | Traction Drive / Steering |
| 10 | Hydraulic Components |
| 11 | LPG System |
| 12 | Filterhousing |
| 13 | Dust Bin |
| 14 | Lifting System Dust Bin |
| 15 | Fan |
| 16 | Automatic Cleaning System |



The blast wheel method is a revolutionary invention based on a simple principle:

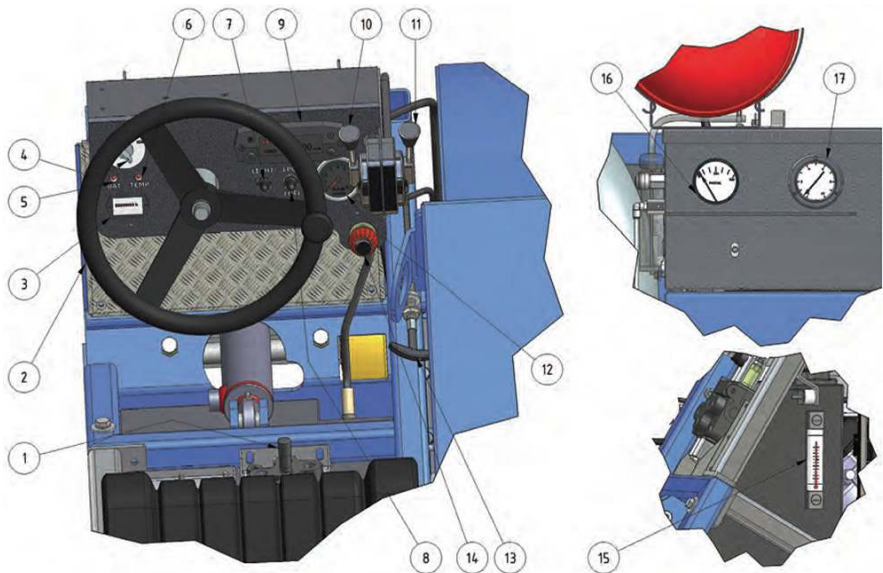
After mechanical pre-acceleration, the abrasive is thrown onto the surface at high speed by the blast wheel. Once the abrasive has impacted the surface it rebounds into a rebound plenum. The rebound plenum deflects the abrasive into an air current separator. In this location, dust and other contaminants are removed from the abrasive so that only abrasive containing a very small amount of dust is falling back into the abrasive storage hopper to reflow to the blast wheel.

The integrated filter unit provides a dust free working environment, and improved service life of machine and tools. Ensuring a clean environment is a matter of ethics and should be observed by professional associates. IMPACTS uses a particularly arranged filtering material that is certified and has high filtration efficiency.

3.4 Operating Elements

The Control Panel contains all controls and instruments used for supervision and control of the machine.

1	Control lever lift / lower
2	Steering wheel
3	Hour meter
4	Ignition / starter switch
5	Charge current warning light
6	Overheat warning light
7	Switch light
8	Combustible selection switch
9	Combined display
10	Control lever abrasive valve
11	Control lever traction drive
12	Revolution counter
13	Choke fuel mode
14	Accelerator cable
15	Oil level and temperature indicator
16	Differential pressure gauge
17	Pressure gauge



Control Lever Lift / Lower

Lift machine: Pull lever (1) back. Lower machine: Push lever (1) forward.

Steering Wheel

Steering wheel (2) steers machine in required direction.

Hour Meter

The hour counter (3) shows the sum of the actual working hours performed by the blast wheel.

Ignition / Starter Switch

Connects and disconnects the power supply. Starts and stop engine. When the ignition key (4a) is removed, the Blastmachine is protected from use by unauthorized persons.

Charge Current Warning Light

When lit (5) indicates that the battery is not charged.

Overheat Warning Light

When lit (6) indicates that the coolant temperature is too high.

Switch Light

To switch on the front working lamp. In position On the switch (7) is illuminated.

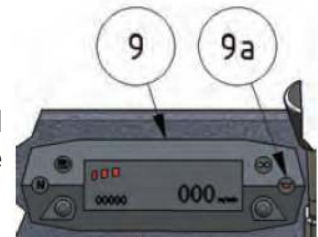
Combustible Selection Switch

Combustible selection switch (8): Fuel or L.P. Gas mode: In fuel mode remove plug from air filter housing.



Combined display with engine oil pressure warning light

Combined display (9) shows the engine speed and travel speed. Engine oil pressure warning light (9a), when lit indicates insufficient oil pressure in the engine. (Shown travel speed divided by 10 is the travel speed in m/min).



Control Lever Abrasive Valve

This Lever (10) regulates the magnetic valve to control the flow of abrasive towards the blast wheel.

Open valve: Pull lever back.

Close valve: Push lever forward.

Control Lever Traction Drive

Control lever (11) to control drive direction and speed.

Push lever forward: Machine drives forward, speed depending on lever position.

Pull lever back: Machine drives backward, speed depending on lever position.

Revolution Counter

Revolution counter (12) shows the engine speed.

Choke Fuel Mode

Pull lever (13) back to open the choke valve when engine is cold. For further information look at the owner's manual of the Kawasaki engine.

Accelerator Cable

Accelerator cable (14) to control the engine speed. Mode of motion: Micro adjustment by rotating the nut (14b); press the button (14a) to make big push/pull adjustment.



Oil level and temperature indicator

Indicator (15) which shows the hydraulic oil level and temperature.

Differential Pressure Gauge

The differential pressure gauge (16) shows the current conditions of the filter cartridges.

Pressure Gauge

The pressure gauge (17) shows the working pressure of the automatic cleaning system.

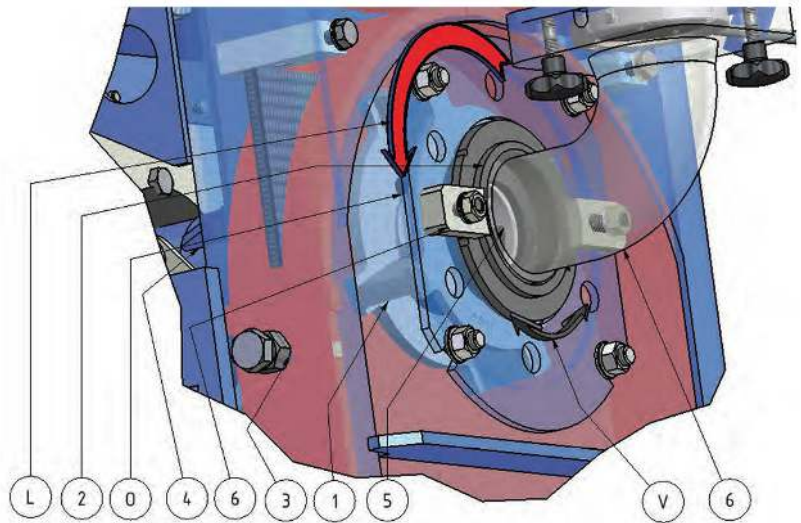
3.5 The Wheel Kit

The heart of every blast-machine is the blast wheel (1) this will throw the abrasive to the surface to treat, using centrifugal forces. The blast wheel is placed in a side force wheel housing (2) protected with replaceable wear plates (3).

The blast wheel is driven by a belt drive and mounted on a bearing unit (4). The correct rotation of the S320RD blast wheel is CCW. (L)

The center of the blast wheel shows a pre-accelerator, called impellor, (5) feeding dosed quantities of abrasive onto the blades of the turning blast wheel. On top of this is the control cage (2) which, once it is carefully set, regulates the direction of the abrasive flow.

The Control Cage, held by two clamps needs to be adjusted (V) so the blast pattern shows to the center of the machine. Turning the control cage CCW will move the Blast Pattern to the right and turning it CW will move the blast pattern to the left.

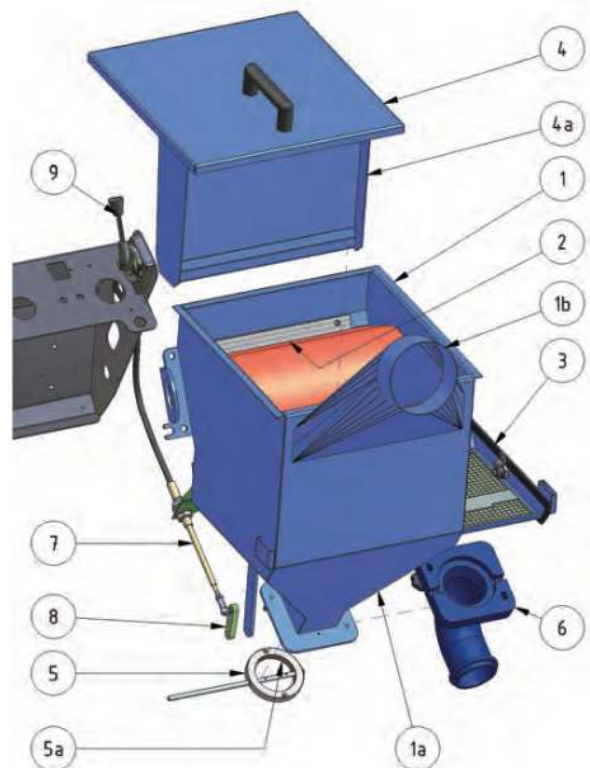


3.6 The Separator

1	Separator housing
2	Deflector
3	Separator tray
4	Separator lid with baffle plate
5	Magnetic control valve
6	Feed spout
7	Abrasive control cable
8	Lever
9	Control lever magnetic-valve

The separator (1) is mounted to the end of the rebound plenum. The deflector (2) and baffle plate (4a) will stop the reflected abrasive.

The filter, connected to the hose connector (1b) will generate an appropriate airflow within the separator so this device will separate dust from abrasive. The abrasive drops back to the storage where it has to pass a wire mesh tray (3).



This tray (3) is fitted to prevent any coarse contaminants from getting into the blast wheel. In order to clean the wire mesh tray it can be removed from the side.

To regulate the flow of abrasive to the blast-wheel there is a magnetic-valve (5) fitted between Storage-Hopper (1a) and feed spout (6).

This valve has a turnable shutter (5a) that is linked to a lever (8) controlled by the control cable (7).

Changing the angle of the shutter position results in a different amount of abrasive flowing to the blast wheel. Feeding more abrasive causes more work and results in a higher load on the engine. Load on the engine is indicated by the revolution counter.

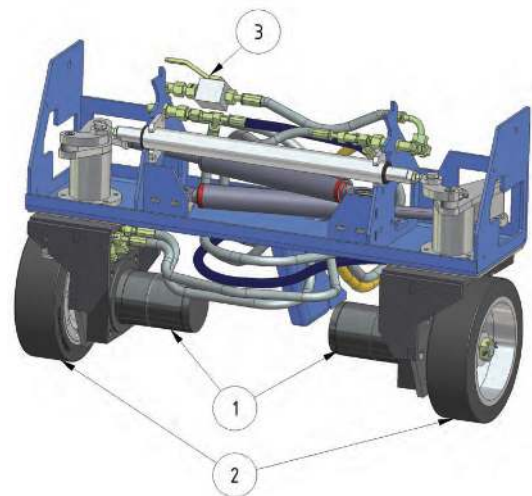
Do not load more abrasive than recommended for the S320RD. The engine speed should be between 3,250 and 3,300 min-1.

3.7 The Traction Drive

- | | |
|---|-----------------------|
| 1 | Hydraulic Drive Motor |
| 2 | Drive Wheel |
| 3 | Bypass Valve |

The machine S320RD is driven by two hydraulic drive motors (1). The drive wheels (2) are permanently connected to the hydraulic drive motors.

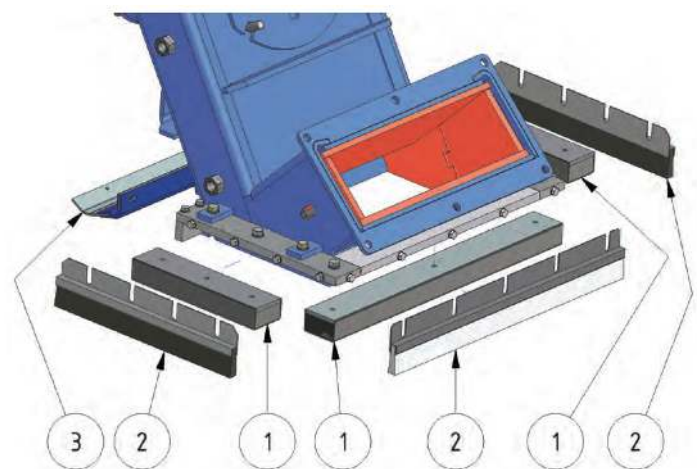
To move the machine by hand, change the position of the bypass valve (3). Once the machine is in place, be sure to change back the position of the bypass-valve to avoid inadvertent movements of the machine.



3.8 The Base Seals

- | | |
|---|----------------|
| 1 | Magnetic Seal |
| 2 | Brush Seal |
| 3 | Tail Seal |
| 4 | Adjuster Screw |
| 5 | Magnet Holder |
| 6 | Seal Plate |

On the front and side are magnetic seals (1) surrounded by brush seals (2). On the rear you will find a seal called tail-seal (3). This seal slides over the surface and prevents abrasive getting out of the blast area.



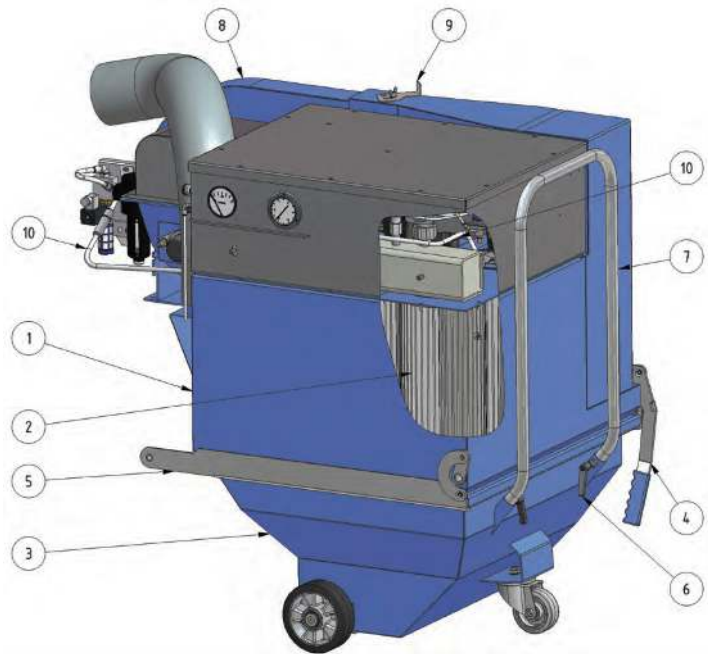
All seals should seal against abrasive spray. The correct setting of the magnets is approx. 12mm over the floor depending on the application. This setting is very important for best function of the machine. The adjustment is done by setting screws. See chapter 5 for adjustment instructions.

3.9 The Filter Housing

The filter housing (1) contains the filter cartridges (2) as well as the automatic cleaning system (10).

The cartridges separate the dust from the air reducing the air becoming dirty.

For cleaning, there is an automatic cleaning system which is supplied with compressed air by a compressor.

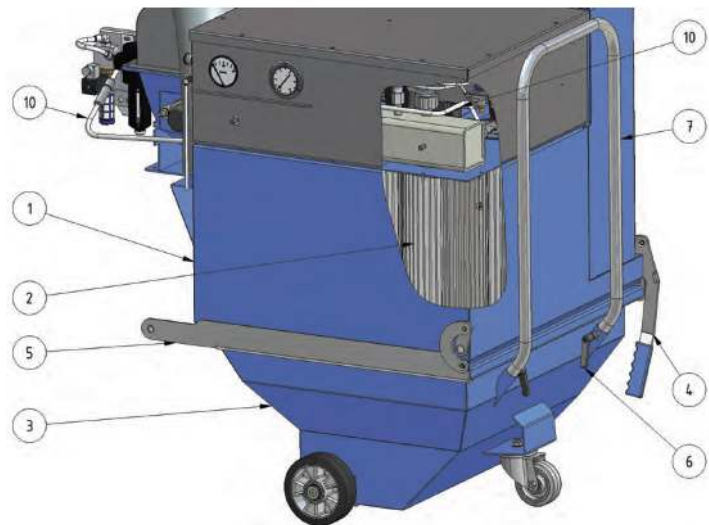


3.10 The Dust Bin and Lifting System

Below the filter housing, the dust bin (3) collects the dust. The dust bin collects about 100 liters of dust and is supplied with two wheels and one caster for easy transport.

The dust bin (3) is fixed to the filter housing (1) by a lifting system (5) which can be operated by a movable lever (4).

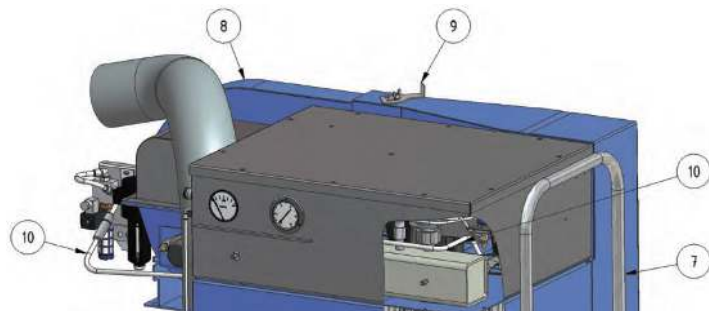
For changing the position of the dust bin handle (7,) loose the locking levers (6) ,move the handles to the desired position ,and retighten the locking levers.



3.11 The Fan

The fan unit (8) which is directly connected to the filter housing, generates the required vacuum.

To adjust the airflow, use the lever (9) which controls the throttle valve in the top of the air exhaust duct.



3.12 The Automatic Cleaning System

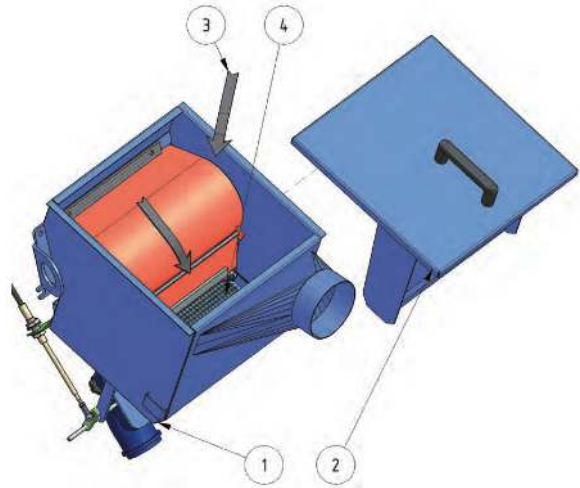
The filter unit is equipped with an automatic cleaning system which cleans the cartridges during operation of the filter unit. Traditional systems do not allow this. This system mainly consists of 3 components: the compressor, the air splitter, and the electronic timing control. The pressure gauge and the differential pressure gauge integrated in the filter housing inform about the status of the cleaning system.

3.13 Abrasive Media

In order to operate IMPACTS blast-machine S320RD you need hardened, spherical abrasive. The machine S320RD has been especially designed to be operated with IMPACTS abrasive.

The IMPACTS abrasive is of very high quality and owns the rebounding ability required for the efficient use of model S320RD. The selection of the abrasive is very important since this is the material to carry out the surface treatment.

Take off the lid (2) from the separator (1), assure the wire mesh tray (4) is in place, and fill up abrasive (3) distributing evenly up to the bottom of the mesh. Occasionally check function of the deflector shutter.



3.14 Selecting Abrasive Media

Media IMPACTOR S 290

Applications:

- Creates fine profiles and is often used when the surface is only subsequently sealed, for example, on vacuumed concrete or for the removal of thin layers of paint on non-glazed tiles

Media IMPACTOR S 330

Applications:

- Creates a fine to medium texture on concrete
- Removes glazing from tiles prior to subsequently coating with anti-skid floor sealing
- Removes old impregnations and coatings about 1 mm thick

Media IMPACTOR S 390

Applications:

Standard abrasive, suitable for about 50-60% of all applications. Creates a medium profile on concrete. Fulfills the same purpose as Media No. 3 when a higher speed of the machine is required, i.e. on asphalt, in order to keep the thermal load low.

- Removes laitance from new concrete
- Roughening of smooth concrete or natural stone
- Removes coatings with a thickness of 1-3 mm
- Cleaning of steel surfaces

Media IMPACTOR S 460

Applications:

Used to generate a rough profile and to improve work output

- Removes laitance from new concrete
- Removes thicker paints or rust from steel surfaces
- Removes flex coatings from parking decks
- Removes painted road lines
- Re-texturing on asphalt surface and concrete roads

Media IMPACTOR GL18

Applications:

Use only in addition to Media No. 3 and No. 4 with maximum 30% content. This media should never be used without blending, otherwise the wear in the machine would increase disproportionately.

- Removes polyurethane coatings
- Removes adhesive remnants
- Removes rubber deposits
- Penetrates hard to remove coatings
- Also suitable for use on steel

The effectiveness of the S320RD is dependent on the rebound effect which ensures that the abrasive can be re-used.



Please take into account that the use of incorrect abrasive increases wear. Our service engineers have the experience to select the appropriate abrasive for the individual cases of application.

Please consult your IMPACTS customer service department if you have any questions about the selection of the best abrasive for your blast cleaning work.

3.15 Care and Maintenance

Special attention and regular maintenance of the machine and its parts are imperative for functioning and safety.

In order to prevent unnecessary downtimes it is recommended to keep original spare and wear parts on stock as listed in the maintenance box.

A list of contents of the maintenance box is provided in Chapter 10 to enable the above mentioned work to be carried out quickly.

The blast area must be sealed completely and all sealings of the base seal must be in good condition. If abrasive is getting out, change the seals. The filter housing must be airtight and all sealings of the dust bin must be in good condition!

Dust leaving the filter unit instead of clean air indicates that the filter cartridges are either damaged or not correctly fixed. If the filter unit performs ineffective suction control the difference pressure gauge. (See also chapt. 7 Maintenance)



All persons in the proximity of the machine in operation must wear safety glasses with lateral protection and safety shoes. The machine operator must wear close-fitting protective clothing.

Chapter 4.0 Transportation

- 4.1 General Notes
- 4.2 Transport
- 4.3 Transport of the Machine by Vehicle
- 4.4 Operation Conditions
- 4.5 Assembly
- 4.6 Dimensions

4.1 General Notes



Before the machine is used for the first time, IMPACTS authorized dealers offer a course to familiarize maintenance and operating personnel with all elements of the machine. We are not liable for damage caused by incorrect use of the machine by personnel not trained by IMPACTS.

4.2 Transport

In order to transport the machine from a vehicle to the working area you need to lift the machine up with the lifting cylinder.

To lift up the machine, pull back (B) the lever (A). When the cylinder reaches the end position release the lever.

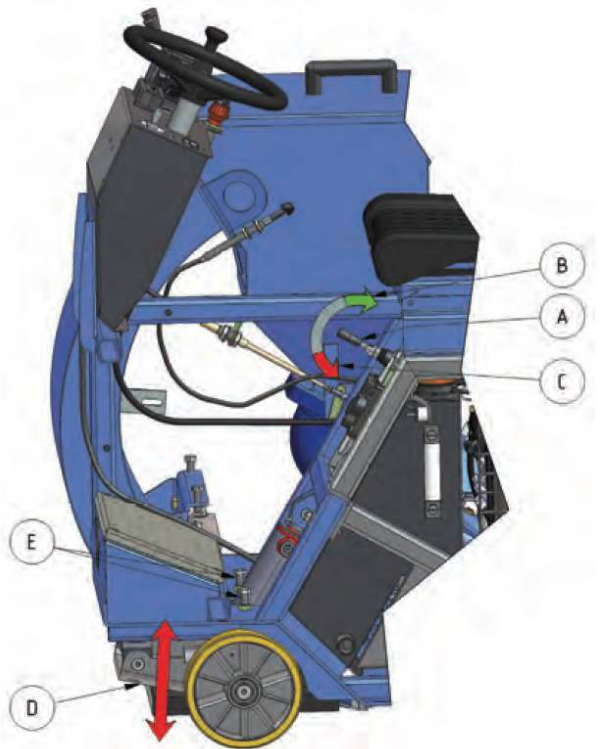
To lower the machine, push the lever (A) forward (C). When the wheel bracket (D) is in contact with the height adjusting screws (E), release the lever.

Take care when the machine is going backward. This could cause the rear seals to become damaged.

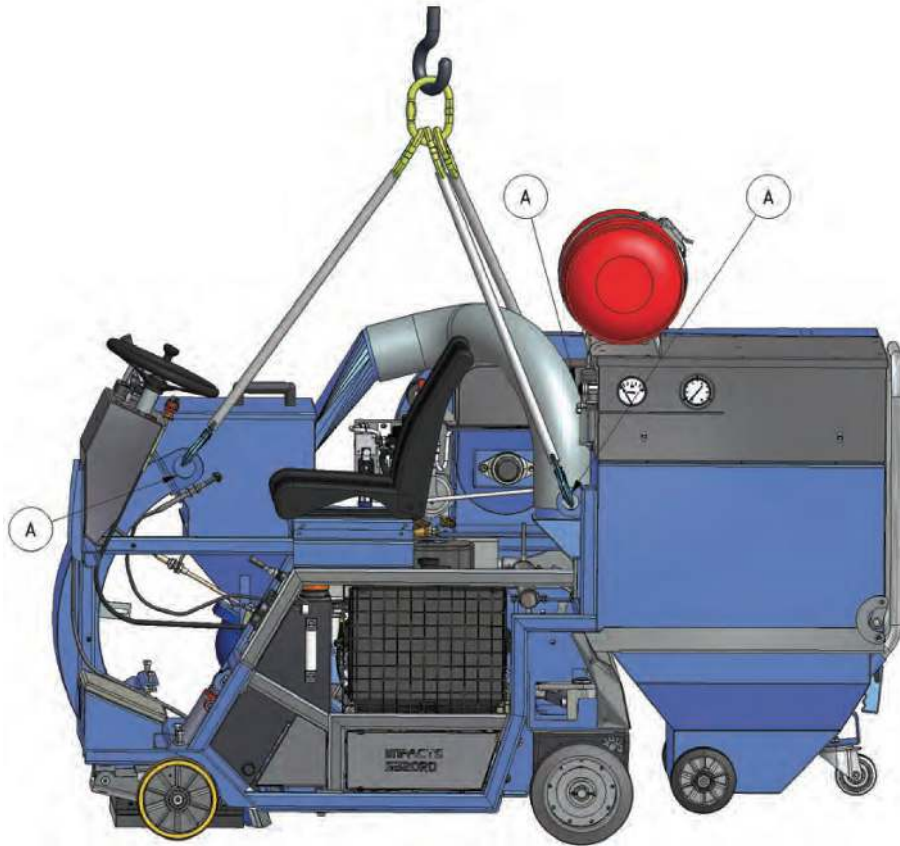
Hoisting Equipment

When transporting the machine with hoisting equipment like a crane or a lift, check the total weight permitted (See Chapter 1- Dimensions).

Please use only appropriate, allowed, and qualified hoisting equipment as well as ropes and chains. You can also find the weight of the equipment on the serial plate on the machine. Fix ropes and chains only at locations as shown. (A)



Remove all abrasives from the machine and the dust from the dust bin before transport. The machine may only be lifted as shown. Weight and dimensions of the machine are shown in Chapter 1.



4.3 Transport of the Machine by Vehicle

When transporting the machine with vehicles, use straps to tighten the machine to the cabin of the vehicle. This is critical to avoid damage to the machine or harm to any personnel. Use at least two straps, or tighten the machine with one strap to the cabin wall of the vehicle. Make sure that all parts of the machine are secured.

4.4 Operation Conditions

Check the surface before treatment for loose parts (stones, screws, etc.). The surface must be swept if necessary. Make sure that the machine can travel over all inequalities on the surface. Smaller inequalities, like weld seams or floor joints, will not effect the performance of the machine.

4.5 Assembly

The machine must be operated in accordance with instructions given in Chapter 5 "Initial operation."



Whenever the machine is not used for blast cleaning, the abrasive valve must always be closed!

4.6 Dimensions

Main dimensions and unit specifications of the machine are shown in Chapter 1 "Technical Data."

Chapter 5.0 Start Up

5.1 Preparing for Start Up

5.2 Refueling

5.3 Start Up

5.4 Initial Operation

5.1 Preparing for Start Up

Before start up, ensure that all existing protective housings are fitted and the filter unit is connected correctly.



All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. The operator is obliged to wear close fitting protective clothing.

Carefully handle all plugs, cables, hoses, and operating devices. Avoid any contact with live wires.

Any work on the electrical system has to be done only by qualified specialists.

Check the surface before treatment for loose parts (stones, screws, etc.). The surface must be swept if necessary. Make sure that the machine can travel over all inequalities on the surface. Smaller inequalities, like weld seams or floor joints, will not effect the performance of the machine.

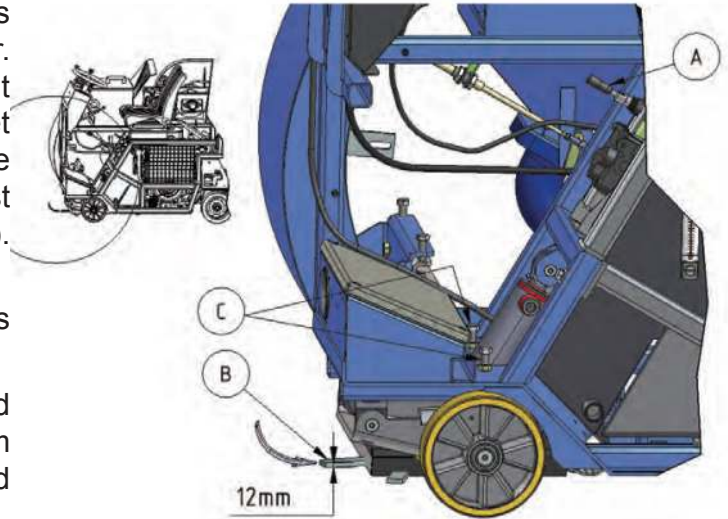
In order to avoid downtimes, a regular inspection is essential. Carry out the following checks before any start-up:



Before start-up, operators and other personnel must be familiar with the safety regulations given in this manual.

1. Check whether all machine parts are assembled safely and correctly.
2. Check all screws and other fasteners for tight seat.
3. Check the abrasive storage hopper, the feed spout, and the blast wheel parts for foreign bodies and remove them.
4. Check blast wheel blades, impeller, control cage, liners, and fastening screws for damages and wear.
5. Check the magnetic and brush seals for wear.
6. Make sure the dust container of the filter unit is empty. Please comply with the local waste treatment regulations considering the removed material.
7. Check the separator parts for wear and defects. Remove foreign bodies and dust deposits in order to prevent the separator from being blocked.
8. Check the electrical connections for dirt and foreign body deposits.
9. Check the level of abrasive in the storage hopper. Fill up if necessary.
10. Place the blast machine onto the surface to be treated.

11. Check the height of blasting machine's distance between magnet and the floor. It should be 3/8" (12mm). For height adjustment, a 3/8 inch or 12 mm sheet steel strip can be shifted below the magnetic sealing (B). In order to adjust it, you need to set the setting screws (C). Also see chapter 7.
12. Replace or repair all damaged parts before starting the machine.
13. Fill the separator equally with the selected abrasive (see Chapter 3) up to the bottom of the separator tray. The magnetic feed valve must be closed while doing this.

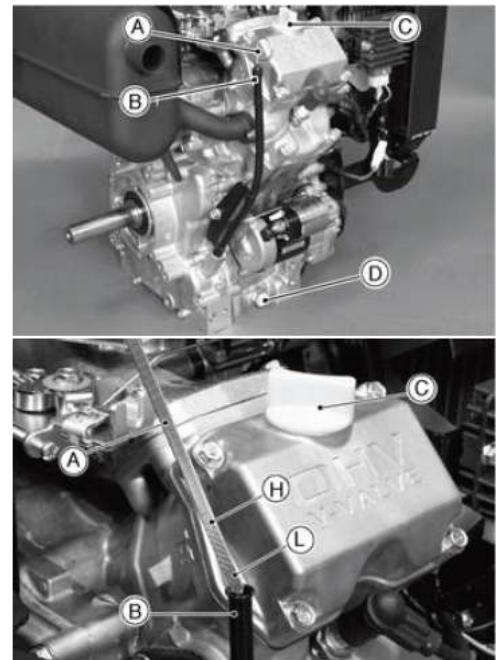


Check Engine Oil Level

1. Fold the seat forward.
2. Remove the oil gauge (A) and wipe it with a lint-free clean cloth.
3. Insert the oil gauge into tube (B) firmly fitting the plug into the tube.
4. Remove oil gauge and check the oil level. The oil level should be between the "H" (H) and "L" (L) marks on the oil gauge.
5. If the oil level is near or below the "L" mark, remove the oil filler cap (C) and pour some engine oil in slowly to bring the oil level to the "H" mark. Recheck level.

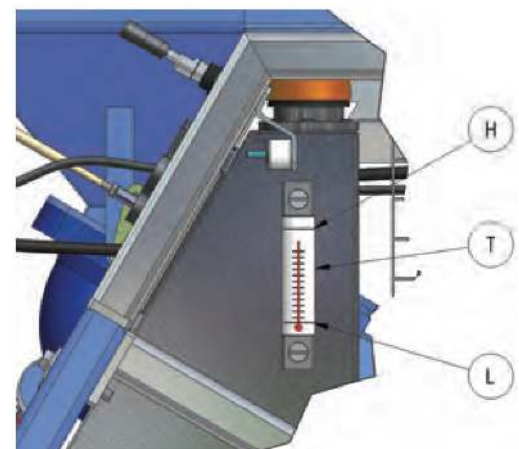


Do not fill above the "H" mark. Excess oil will cause a smoking condition, and may cause the engine to overheat.



Check Hydraulic Oil Level

1. Check the hydraulic oil level at the oil level and temperature indicator (T).
2. Lower the lifting cylinder, the oil level must be near the "max." mark (H). See also chapter 7.

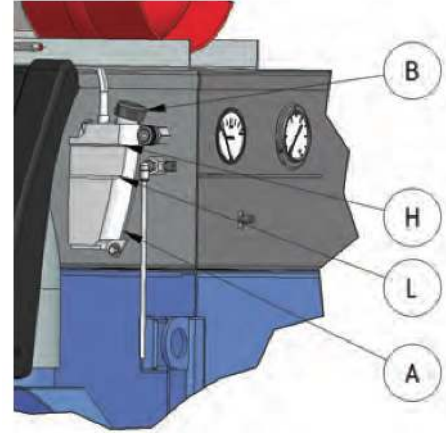


Check Coolant Level



The cooling system is a closed type. Never open the radiator cap! Doing so may induce air into the cooling system and may cause overheating.

1. Check the level when the engine is cold (room or atmospheric temperature).
2. Check coolant level only at the overflow reservoir (A). The coolant level should be between the "H" (H) and "L" (L) marks.
3. If the amount of coolant is insufficient, remove the cap (B) from the reservoir and add coolant to the "H" mark. When replenishing, add a pre-mixed solution of water and anti-freeze of the same proportions as that already in the system.
4. Reinstall the cap.



When the engine is hot, the coolant system is pressurized and the overflow reservoir cap should be opened slowly until all pressure is released.

5.2 Refuelling

Before filling up or changing the gas tank, the machine must be safely parked. See Chapter 2.5.

- **Fire Protection Measures:** When dealing with fuels and liquid gas, no smoking, naked flames, or other sources of ignition are permitted within the vicinity of the tank. Signs indicating the risk zone must be arranged to be clearly visible. Storage of highly flammable materials in this area is not permitted. Functioning fire extinguishers must be available to hand in the filling area at all times.



To prevent liquid gas burns, use only carbon dioxide dry extinguishers or carbon dioxide gas extinguishers.



When changing the gas tank wear leather protective gloves. Liquid gas causes frostbite wounds on exposed skin!



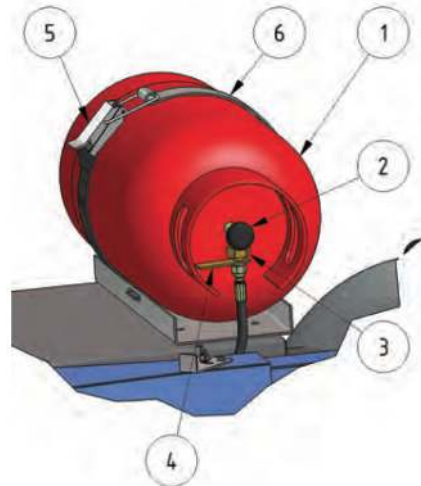
The gas tank may be changed only at the specified locations by trained and authorized persons.

1. Park machine securely before changing (see Chapter 2.5)
2. Close shut-off valve (2) tightly (CW).
3. Start engine in neutral and run L.P. Gas system until empty.
4. Unscrew nut (3) with a suitable wrench (left hand thread!), holding with the handle (4).
5. Remove hose and immediately screw the valve cover cap onto the empty gas tank (1).
6. Release the strap (5) and remove the retainer (6).

7. Carefully remove the gas tank from its holder and deposit securely.
8. Place the new gas tank in the holder and turn until the connections on the shut-off valve point downward.
9. Attach the gas tank securely with retainer and strap.
10. Re-attach the hose as specified.
11. Carefully open the shut-off valve and test the connection for leaks using a foaming agent.



Observe guidelines/regulations of L.P. Gas tanks from your local supplier.



5.3 Start Up



All persons near the machine must wear safety glasses with lateral protection, ear protection, & safety shoes. The operator is required to wear close-fitted protective clothing.

Start up of the blast-cleaning machine should happen in the following order:

1. Start engine.
2. Check that the magnetic valve is closed (the black lever (10) in position (Z) - "closed").
3. Slowly open shut-off valve (2) on the gas tank.
4. Insert key (4a) in ignition/starter switch (4).
5. Turn ignition/starter switch into position "ON" (I).
6. The warning lights for charge current (5) and engine oil pressure (9a on the combined display) light up.
7. Pull out accelerator cable (14) slightly.
8. Turn the ignition/starter switch to position "IGN" (II), at the same time depress shortly the fuel primer button (P) of the L.P. Gas vaporizer (V).

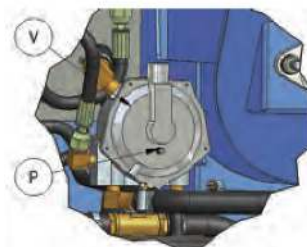
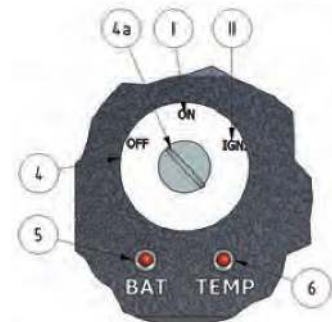


Only operate the starter for max. 5 seconds at a time. Before repeating the start process, return the ignition/starter switch to position "OFF" and wait 15 seconds.

9. Release key as soon as the engine starts. It automatically returns to position "I."



The warning lights for charge current and engine oil pressure must go out as soon as the engine starts. If this is not the case, switch off the engine and repair the fault.



After engine has started, carry out a test run with the following functions check:

1. Control the engine speed with the accelerator cable in various ranges, checking for free movement of the cable.
2. Check hydraulic control functions for forward/backward drive and lift/lower for smooth function.
3. Turn steering wheel to both end positions and check steering for function.



Do not run the engine to warm on idle. The engine quickly reaches its operating temperature under moderate load and at varying speed. To warm up the engine run it for 3 to 5 minutes before putting the equipment under full load.

Idle	1550 min-1
Activation speed of the coupling ca.	1800 min-1
Work engine speed	3200 min-1

Fault displays during operation

If these warning lights display:

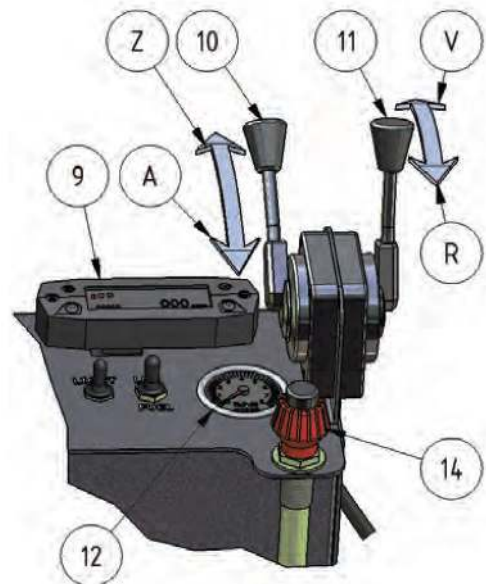
- charge current (5)
- engine oil pressure (9a), or
- coolant temperature (6)

then, the engine must be switched off immediately. The engine may not be started again until the fault has been repaired. For fault search and remedies, see chapter 9.

4. When all function tests have been carried out perfectly and operating temperature has been reached, the machine is ready for use.
5. To operate the machine in a forward motion, bring the engine speed up to 2400 min-1.

5.4 Initial Operation

1. Adjust the working engine speed of 3200 min-1 with the accelerator cable (14). Above the activation speed of coupling from ca. 1800 min-1, the blast wheel, fan, and compressor are driven by the transfer gearbox.
2. Push the traction drive lever (11) slowly forward (V), until the required speed, shown in the combined display (9), has been reached.
3. When pushing the traction drive lever forward, also pull the abrasive valve lever (10) towards direction (A) so the abrasive valve opens and abrasive flows towards the blast-wheel.



4. Keep eyes on the engine speed (12), the engine speed should not come under 3150 min-1. Adjust the engine speed by rotating the nut of the accelerator cable or close the abrasive valve pushing the valve lever slowly forward.



When blasting concrete, the abrasive feed valve only may be opened when the blast-machine is in forward motion! If the machine is at a standstill and the valve is opened deep grooves will be blasted into the concrete surface within seconds.

5. After having blasted approximately 4-5 ft (1-2 meters), close the abrasive valve, stop the machine, and check the blasted surface.
6. If the blast pattern is irregular, it may be necessary to re-adjust the blast pattern (see Chapter 7 "Setting the blast pattern") or select different speed for the machine.



When the blast head is lifted from the floor, abrasive will spurt out of the sides of the blast head at high speed. If the machine is moved, the blast head raised, the abrasive feed valve must be fully closed.

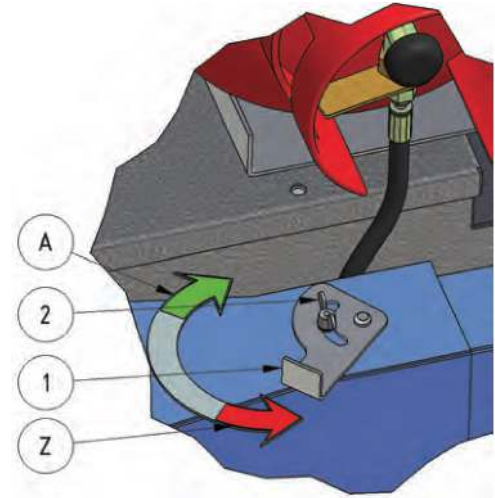


Alter the travel direction only while the feed valve closed.

7. To adjust the airflow, use the lever (1) which controls the throttle valve on top of the air exhaust duct. Untighten the wing nut and move the lever in direction (A) to open or (Z) to close the throttle valve. Tighten the wing nut.
8. During a period of a few minutes, watch how much dust comes up to analyze the filling behavior and to avoid any overloading of the dust bin.



*Regularly dump the dustbin of the filter unit.
Do not overfill the bin to avoid dust exposure when opening the bin.
Comply with the local waste treatment regulations considering the removed material.*



Chapter 6.0 Operation

- 6.1 Daily Operation
- 6.2 Information about the Chart Speed
- 6.3 Recommended Blast Paths
- 6.4 Empty Out the Dust Bin
- 6.5 Turning Off the Machine
- 6.6 If Failure Occurs
- 6.7 Safety Shutdown
- 6.8 Restart
- 6.9 Proceedings Prior and After Longer Stoppage
- 6.10 Parking the Machine Safely in L.P. Gas Mode

6.1 Daily Operation

This operating manual has to be always with the machine at the job site!



*Only trained personnel can operate and perform work on the machine. **Note the statutory minimum age!** Clearly specify the responsibilities of personnel for operation, setup, service, and maintenance work.*

Instructions for daily operation of the blast machine:

- Check daily before starting the operation whether all machine parts are assembled safely and correctly.
- Before switching on the machine, check that all safety covers are in the right position.

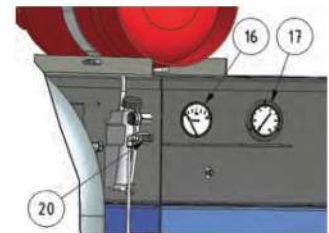
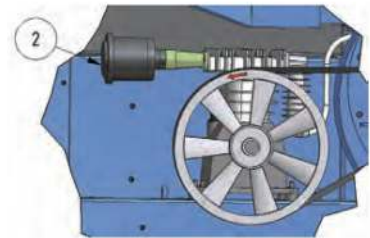
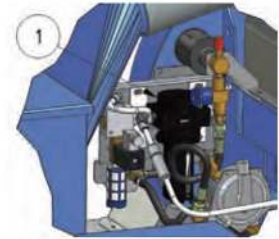


Independent of the following guidelines, local safety regulations apply to the operation of the machine in each case

- Consider the disposal regulations as well as local regulations.
- Check the surface to be treated, for loose parts (stones, screws, etc.). The surface must be swept if necessary. Remove all objects from the surface in order to avoid damage to the machine seals or serious damage to blast wheel and wheel-drive.
- Regular inspections are important in order to avoid downtimes of your blast machine. See Chapter 7 maintenance.
- Treat all plugs, cables, hoses, and operating devices with special care.
- Avoid any contact with live wires.
- In case of doubt of initial operation, see chapter 5.

For daily operation of the integrated filter unit, please consider the following points:

- Check daily the water separator (1) of the compressed air system.
- Weekly check the condition of the intake filter inlet (2) of the compressor. This is strongly recommended, if the inlet shows dirt and dust, it must be cleaned or replaced.
- During operation always observe the differential pressure (16) of the filter cartridges, the pressure should not rise over 1.5 kPa. If the differential pressure does not adjust visibly from the additional cleaning of the cartridges under 1.5 kPa the cartridges must be exchanged. The pressure (17) of the compressed air system should reach 6 bar again during the pulse cycles.
- Weekly, open the exhaust valve (20) of the compressed air system to discharge condensation.



All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. The operator of the machine is obliged to wear close-fitting protective clothing.

6.2 Information about the Chart Speed

The selection of the correct chart speed of the blast machine is essential for a good result. In the case that the surface shows different characteristics, specifically different hardnesses or different coating thicknesses, a uniform blast result will be achieved varying the chart speed while blasting.

The chart speed depends on the material of the surface to be blasted and the desired profiling.

The correct chart speed will be found out by observing the blasted surface and varying the speed during the blast cleaning process. Combined display shows the travel speed (shown travel speed divided by 10 is the travel speed in m/min).

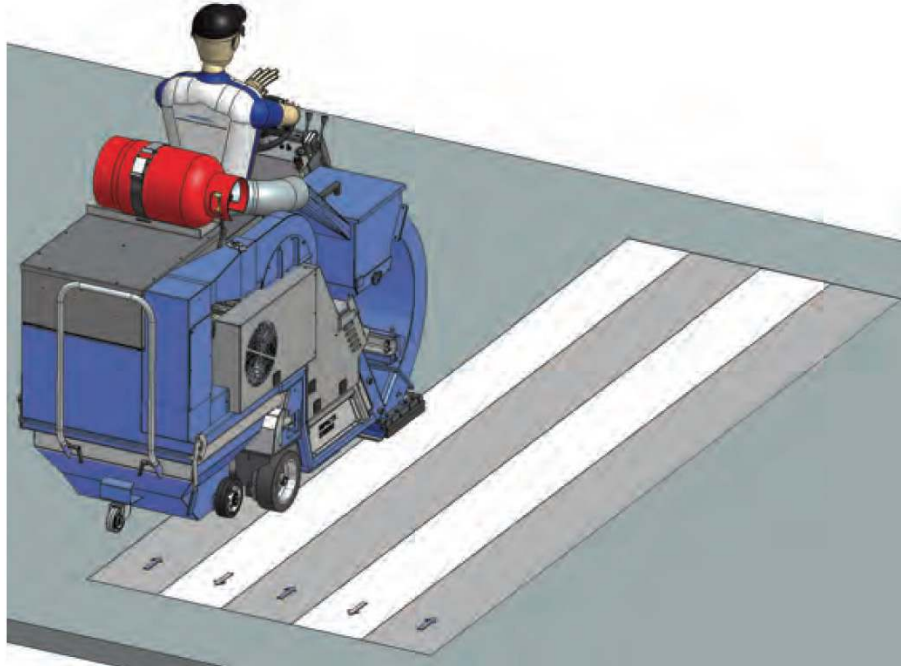
Slight profiling on concrete requires a higher speed than coarse profiling.

Blasting on steel requires a very low chart speed.

6.3 Recommended Blast Paths

Picture shows the recommended blast paths.

- **To rotate the machine:** At the end of the blast path, close the feed valve. Then turn the machine to the right (or left) and guide it in an arc to line up next to the last blasted path. Repeat this process in order to complete the surface.

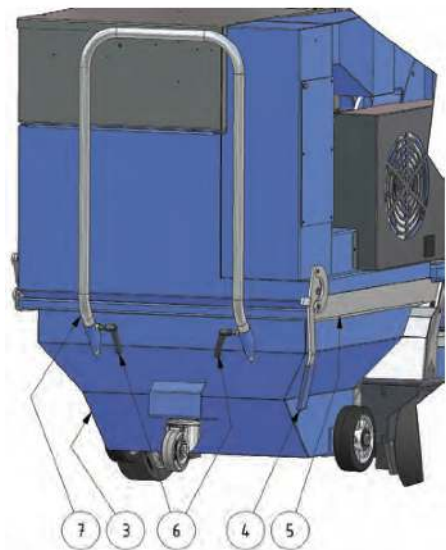


6.4 Empty Out the Dust Bin

The dust bin of the filter unit should be checked regularly.

The time intervals depend on the attached machine as well as the surface to be treated.

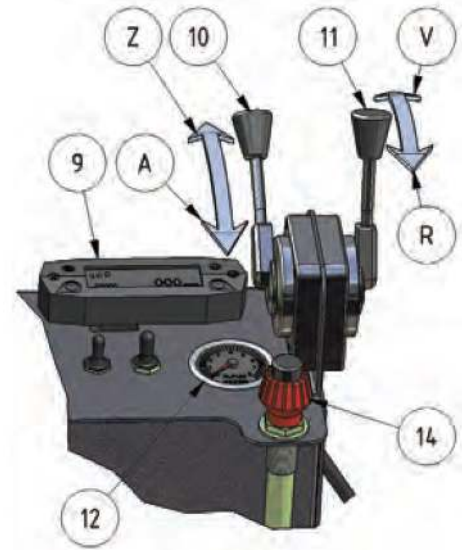
1. For changing the position of the dust bin handle (7) loose the locking levers (6) move the handle to the desired position and retighten the locking levers.
2. Lift up, to the upright position, the rear handle (4) carefully to drop the dust bin (3) out of the lifting device (5). The lifting device (5) will go down. Remove the dust bin and empty it into a provided container.
3. For reassembling push the container to the dead stop into the lifting device. Finally push the handle (4) down again for lifting the dust bin.



When opening the Lifting Device of the Dust Bin be aware of the increased weight. Swivel the lever carefully upward! Consider state and local disposal regulations.

6.5 Turning Off the Machine

1. First close the feed valve by the handle (10), push this forward towards direction (Z).
2. Keep the traction drive switched on so the machine moves towards (V) as long as the feed valve is not fully closed to assure no grooves blasted into the surface.
3. Pull the traction drive lever (11) backwards to his center position. The machine will stop. Bring the engine speed down to 2400 min-1.
4. After completion of the work, allow the filter unit to run for a few minutes with throttled fan. This will allow the filter cartridges to have a better cleaning effect. This is specially recommended when operating in an environment with high air humidity and if the treated surface is moist.
5. Lower the engine speed to an idle. Keep running at idle for about one minute.

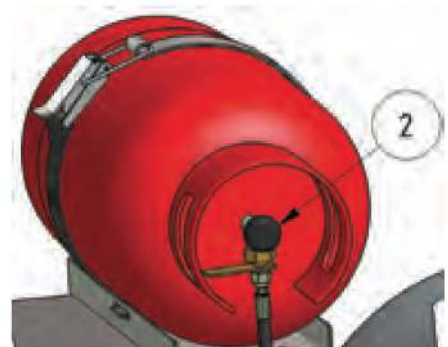


Engine damage can occur from run-on or after-burning if engine is stopped suddenly from high speed loaded operation. Reduce engine speed to idle for one minute before shutting engine off.

6. Turn the ignition/starter switch (4) to position "Off".
7. Remove key (4a) from ignition/starter switch.

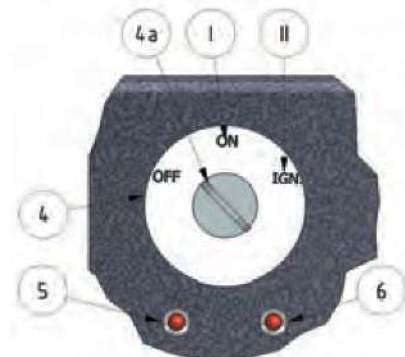
L.P. Gas Mode:

1. Close the shut-off valve (2) of gas bottle. Wait until the engine stops.
2. Turn the ignition/starter switch (4) to position "Off".
3. Remove key (4a) from ignition/starter switch.



Adjust airflow throttle valve to previous position. Assure all rotating machine parts have come to standstill before inspection or maintenance work starts.

Always arrange the Safety Off Position of the machine as described in Chapter 2.6.



6.6 If Failure Occurs

1. In a case of emergency, you can stop the machine immediately by turning the ignition/starter switch (4) to position "Off."
2. Close the fuel valve or the shut-off valve (2) for gas bottle.
3. Then close the abrasive valve pushing lever (10) towards (Z).



Local safety regulations are valid in any case for the operation of the machine.



Assure all rotating machine parts have come to standstill before inspection or maintenance work starts. Always arrange the Safety Off Position of the machine as described in Chapter 2.6.



Put out all smoking materials and other open flames! Do not operate electric switches! Do not use your phone! In Buildings: Open doors and windows! Bring leaking bottles into the open! Get everybody out of the building, vehicle or area! Use neighbor's phone to call a specialist or the fire department.

6.7 Safety Shutdown



The machine must be set into its "Safety Off Position" before starting any kind of maintenance or repair work. See Chapter 2 "Safety Instructions."

6.8 Restart

After a mechanical failure, please ensure that you find the reason of the failure before you restart the machine. Put the machine in the Safety off Position.

If you can't find the fault or if you are unsure about the reason for the fault, please contact your IMPACTS contact person and ask for help.



Work on the electrical parts of the equipment may only be undertaken by a skilled electrician or by a trained person under the guidance and supervision of a skilled electrician as well as in accordance with the electrical engineering regulations.



Work on the L.P. Gas system of the equipment may only be undertaken by a specialist, as well as in accordance with the L.P. Gas system regulations for L.P. Gas driven vehicles. See chapter 5 "Initial operation."



All persons in the proximity of the machine must wear safety glasses with lateral protection as well as safety shoes. Ear protection may be required. The operator is obliged to wear close-fitting protective clothing.

6.9 Proceedings Prior and After Longer Stoppage

Stoppage Longer Than 3 Months:

- Clean the filter cartridges again thoroughly starting with a fan completely throttled. Switch off the machine (see Chapter 6.5).
- Remove all abrasive out off the separator.
- Remove all abrasive from magnets.
- Empty the dust bin.
- Clean the machine and cover it with a foil.
- Motors, cable, and plugs need to be protected against moisture, dust, heat, and shock.
- Protect bright parts of the machine and power pack with preservative oil.

After Longer Stoppage:

- See Chapter 5 "Initial Operation."

6.10 Parking the Machine Safely in L.P. Gas Mode



L.P. Gas machines should not be parked or driven above ground level in multi-story buildings or on ground level above basements.

L.P. Gas is colorless, heavier than air, and does not disperse easily. It will tend to sink to the lowest possible level and may accumulate in pits, drains, basements, or other depressions.

Therefore, an accumulation of L.P. Gas may occur in areas away from the truck, posing a danger to personnel who are unaware of the potential problems of explosion or frost bite.

Chapter 7.0 Maintenance - S320RD

- 7.1 Recommendations
- 7.2 Maintenance and Inspection
- 7.3 Maintenance
- 7.4 The Blast Pattern
- 7.5 Adjusting the Blast Pattern and Control Cage
- 7.6 Adjusting Magnets and Seals
- 7.7 The Belt Drive
- 7.8 Fitting Belts
- 7.9 Belt Tension
- 7.10 Belt Drive Compressor
- 7.11 Belt Tension Compressor
- 7.12 Taper-Lock Bushes
- 7.13 Wear Parts - Blast Housing
- 7.14 Replacing the Wheel Kit
- 7.15 Replacing the Liners
- 7.16 Replacing Filter Cartridge
- 7.17 Wear Parts - Filter Unit
- 7.18 The Hydraulic Tank
- 7.19 The Gear Box
- 7.20 The Compressor

7.1 Recommendations

Prior to any repair work on the machine and its drives, secure the machine against unintentional switch-on. Put the machine in its Safety Off Position as described in Chapter 2.



Failures due to inadequate or incorrect maintenance may generate very high repair costs and longer stoppage periods of the machine. Regular maintenance is essential.

- Safety and service life of the machine depend, among other things, on proper maintenance.
- The time indications are based on uninterrupted operation. When the indicated number of working hours is not achieved during the corresponding period, the period can be extended. However a full overhaul must be carried out at least yearly.
- Due to different working conditions it cannot be foreseen how frequently inspections need to occur for wear checks, inspection, maintenance and repair works. Prepare a suitable inspection schedule considering your own working conditions.



Sub-supplier's operating & maintenance instructions should be followed during service & maintenance. Close attention should be paid when servicing engine & L.P. Gas system.

7.2 Maintenance and Inspection

A. Recommendations about time, inspection, and maintenance for normal use of the machine.

- W1 = every 50 operating hours, but at least once per week
- M3 = every 500 operating hours, but at least every 3 months
- M6 = every 1000 operating hours, but at least every 6 months
- M12 = every 1000 operating hours, but at least every 12 months

			W 1	M 3	M 6	M 12
Chassis / superstruct:	1.1	Check all load bearing elements for damage		•		
	1.2	Check all bolted connections		•		
Drive unit:	2.1	Internal combustion engine – Refer to separate checklist				
	2.2	Check the gearbox for noises and leakage		•		
	2.3	Check gearbox oil level		•		
	2.4	Change gearbox oil				•
	2.5	Clean the gearbox ventilation system			•	
Wheels:	3.1	Check for wear and damage		•		
	3.2	Check the wheel bearings and ensure secure fastening		•		
Steering:	4.1	Check the steering wheel play		•		
	4.2	Check mechanical parts of steering column and grease, if required		•		
	4.3	Check steering axle, king pins and limit stops for wear and deformation				•
	4.4	Check the hydr. assy for correct functioning and leakage		•		
Hydraulic system:	5.1	Performance check		•		
	5.2	Check all connections for leakage and damage		•		
	5.3	Check hydraulic cylinders for leakage, damage and secure attachment		•		
	5.4	Check the oil level		•		
	5.5	Change the hydraulic oil				•
	5.6	Change the filter cartridge			•	
	5.7	Clean the hydraulic oil ventilation system			•	
	5.8	Check the pressure relief valves for correct functioning				•
Electrical system:	5.9	Check the hose run for correct functioning and damage		•		
	6.1	Performance check		•		
	6.2	Check all cables for secure connection and damage		•		
	6.3	Check the warning installation for correct functioning		•		
	6.4	Check the instruments and displays for correct function		•		
Batterie:	7.1	Check acid density, acid level and battery voltage		•		
	7.2	Check the terminals for secure attachment and apply grease		•		
	7.3	Check the battery cables for damage, renew, if necessary		•		
Exhaust:	8.1	Check the exhaust system for damage and leaks				•

After the first 500 operating hours: Replace the hydraulic oil, the filter cartridge and gearbox oil.

			W 1	M 3	M 6	M 12
L.P. Gas system:	9.1	Check L.P. Gas system for leaks and damage		•		
	9.2	Change L.P. Gas filter by an expert		•		
	9.3	Check L.P. Gas system by an expert				•
	9.4	The toxic substances in the emission are to be checked by a qualified inspector and are to be reduced to the lowest possible level.			•	
	9.5	Check and service Impco units				•

B. Time, inspection, and maintenance of Kawasaki Engine



For detailed information about maintenance and operation, see Owner's Manual of your specific Kawasaki engine model.

The following servicing checklist indicates the operations to be performed and the respective intervals to be observed. The servicing intervals are defined as follows:

• = Normal service

* = Service more frequently under dusty conditions.

K = Have an authorized Kawasaki dealer perform these service.

Maintenance	Interval						
	Daily	Every 25 h	Every 50 h	Every 100 h	Every 200 h	Every 300 h	Every 400 h
Check and add engine oil	•						
Check for loose or lost bolts, nuts and screws	•						
Check for fuel or oil leakage	•						
Check and clean radiator screen	•						
Tighten bolts, nuts and screws		•					
Clean air cleaner foam element		*					
Clean air cleaner paper element			*				
Change engine oil				•			
Clean and regap spark plugs				•			
Change oil filter					•		
Replace air cleaner paper element						*	
Clean combustion chambers						K	
Check and adjust valve clearance						K	
Clean and lap valve seating surface						K	
Inspect radiator and hoses					K		
Check fan belt conditions and tension					K		
Change coolant							K

After the first 8 operating hours: Change engine oil

C. Time, inspection, and maintenance of blast machine and integrated filter unit

The following servicing checklist indicates the operations to be performed and the respective intervals to be observed. The servicing intervals are defined as follows:

- T3 = daily, every 3 operating hours
- T8 = every 8 operating hours, but at least daily prior operation
- W1 = every 50 operating hours, but at least once per week
- 100 h = every 100 operating hours
- M12 = every 2000 operating hours, but at least every 12 months

			T 3	T 8	W 1	100 h	M 12
Blast machine:	1.1	Check whether there is any foreign matter in the hopper, the feed or in the blast wheel unit.	•				
	1.2	Check blast wheel, feed spout and fasteners for wear and damage.		•			
	1.3	Check liners and fasteners for wear and damage		•			
	1.4	Check the separator parts for wear and damage.		•			
	1.5	Remove foreign bodies and dust deposits from separator.		•			
	1.6	Check abrasive level, refill if necessary		•			
	1.7	Check the magnets and seals for wear		•			
	1.8	Fully overhaul and clean the complete machine					•
Filter unit:	2.1	Check compressed-air system for leakage		•			
	2.2	Check condition of dust hose		•			
	2.3	Check dust bin to be empty		•			
	2.4	Check differential-pressure not to exceed a max. of 1,5 kPa		•			
	2.5	Check pulse cleaning pressure range (to run within 1-6 Bar)		•			
	2.6	Check water separator to be empty		•			
	2.7	Check oil level compressor		•			
	2.8	Change compressor oil				•	
	2.9	Check compressor belt condition and tension				•	
	2.10	Drain pressure reservoir			•		
	2.11	Check condition of compressor suction filter, change if necessary			•		
	2.12	Full cleaning and check of all function					•

7.3 Maintenance

As already mentioned in Chapter 5 “Initial operation,” we recommend you make your first repair work on the machine with the help of an IMPACTS personnel. Using this recommendation, your maintenance personnel will have the opportunity to get an extensive training.

Only those repair works are described which occur within the context of maintenance or which are required to replace wear parts.

If you replace parts yourself for specific reasons, the following instructions and work sequence have to be observed:

- You should stock all spare or wear parts that cannot be supplied quickly. As a rule, production standstill periods are more expensive than the cost for the corresponding spare part.
- Screws that have been removed must be replaced with those of the same quality (strength, material) and design.



Prior to any repair work on the machine and its drives, secure the machine against unintentional switching-on. Pull out the key from the ignition/starter switch in order to do this. Store the key in a safe place to find again and avoid accidents.

7.4 The Blast Pattern

Abrasive leaving the blast wheel blades is not thrown in all directions. Scatter is restricted to an angle of about 50°. This is achieved through the use of a control cage which surrounds the impeller. The position of the window in the control cage determines the direction and HOT ZONE of the blast pattern.

Correct adjustment of the control cage and thus of the blast pattern is the most important factor for optimum working with the S320RD blast-machine.

Incorrect adjustment of the control cage results in very high wear and premature blasting-through of the liners in the blast wheel housing, as well as reduced blasting performance and a possible loss of the rebound energy of the abrasive.

Each time the Wheel Kit cage is replaced, the thread of the blast wheel fastening screw should be checked. Make sure that this screw is tightened correctly. In addition, absolute care must be taken to clean the thread from dust and abrasive.

After each blast wheel repair work switch on the engine and accelerate it to ca. 2400 min⁻¹ (without feeding abrasive) in order to find out whether the rotating parts turn freely and without vibration. After that, the blast cleaning procedure can be continued.

The blast wheel motor is designed for a long service life. Damage to the blast wheel motor can be detected by unusual noises or functional failure of the electric motor. In this case, notify our service department.

7.5 Adjusting the Blast Pattern and Control Cage

In order to get a uniform and perfect blast pattern on the treated surfaces, the correct adjustment of the blast pattern is most important.

Prior to any maintenance or repair work on the machine and its drives, secure the machine against unintended switch-on. Put the machine to its Safety Off Position (see Chapter 2).

Incorrect adjustment of the blast pattern results in:

- Uneven cleaning (shadows on the right or left hand side)
- Extreme high wear (Wheel kit and the liners)

Four factors affect the blast pattern:

1. Rotation direction of the blast wheel

The rotation direction of the blast wheel must correspond to the instructions on the housing (arrow indicating the turning direction).

2. Worn tune-up kit

With increased wear of the Wheel Kit (impeller, control cage), the blast pattern will change

3. Size of Abrasive

The size of the abrasive affects the blast pattern. Every change of abrasive requires the blast pattern to be set or to be re-adjusted.

4. Position of the Control Cage

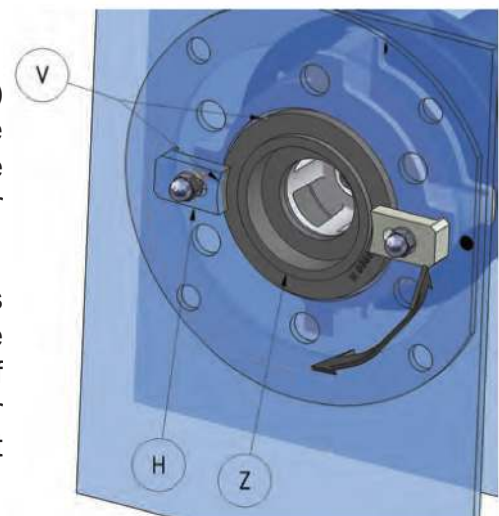
The correct adjustment of the control cage is most important to obtain an optimum blast pattern. The control cage has a lateral window. The position of this window determines where the abrasive is fed on the blast wheel blades and where it hits the surface to be treated.

After changing the Wheel Kit, the adjustment of the control cage must be checked and re-adjusted. To do so, you need to create a blast pattern. The same applies for blasting on another type of surface.

Adjustment of the Control Cage

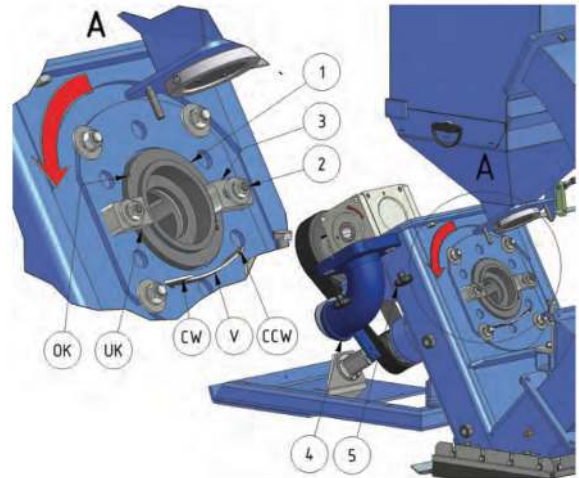
The adjustment is affected by loosening the cage clamps (H) and turning the control cage (Z) in the proper direction. The cast grooves (V) on the control cage show the position of the control cage opening. The feed spout remains in its former position.

Follow these important tips: the control cage opening is approximately opposite to the throwing angle. The abrasive grain size plays an important role here. Different types of abrasive have different throwing characteristics due to their different weights and frictional resistance. This means that you must never use different types.



The control cage adjustment can be carried out as follows:

1. Determine the upper (OK) and lower (UK) window edges of the Control Cage (1).
2. Set the upper window edge (OK) of the control cage to imaginary "11:30 o'clock" (see picture A).
3. Position the cage clamps (3) and tighten nuts (2).
4. Replace the feed spout (4) onto the control cage and tighten it with the two star knobs (5).
5. Move the blast machine in direction (V) (see picture B) on a 5-8 mm thick steel plate and blast for 45 seconds at full abrasive load without moving the machine.
6. Move the machine from the blast zone (R) and carefully inspect the steel plate. You will find the HOT ZONE on the blasted surface where the machine has developed the highest blast intensity. This ZONE is normally a little lighter and warmer than the rest of the blast cleaned area due to the heat that is generated by the impacts of abrasive.
7. Adjust the control cage until the HOT ZONE (HZ) is exactly in the middle of the blast pattern (B). (See illustration below.)



The adjustment of the blast patterns can be carried out as follows:

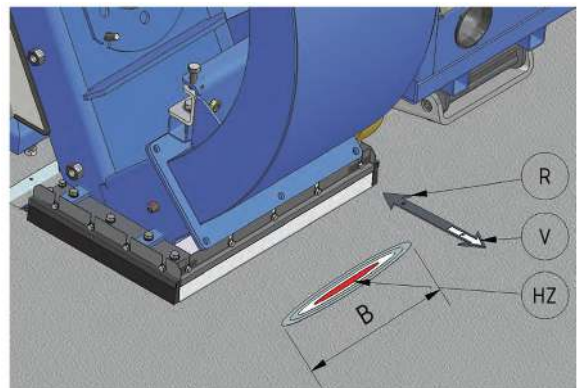


After replacing worn parts with spares, always check the blast pattern in order to get best performance. This is the only way to guarantee proper installation and to avoid unnecessary wear and repair costs.

Note: Illustration is seen from the front into the blast wheel.

Now the blast procedure can be started. When a concrete surface is to be blasted, check the blast pattern again after some distance and readjust slightly if necessary. The blast pattern will change with and increase wear of the Wheel Kit when the size of the abrasive is changed.

- If the blast result shows strong blasting on the right-hand side and weak blasting on the left-hand side (shadows), turn the upper edge of the control cage clockwise (CW) for 2-4 mm.
- If the blast result shows strong blasting on the left-hand side and weak blasting on the right-hand side (shadows), turn the upper edge of the control cage counter-clockwise (CCW) for 2-4 mm.
- Adjust the control cage until the Hot Zone (HZ) is exactly in the middle of the blast pattern (B).



Never loosen cage clamps or try to adjust the control cage when the machine is in operation.

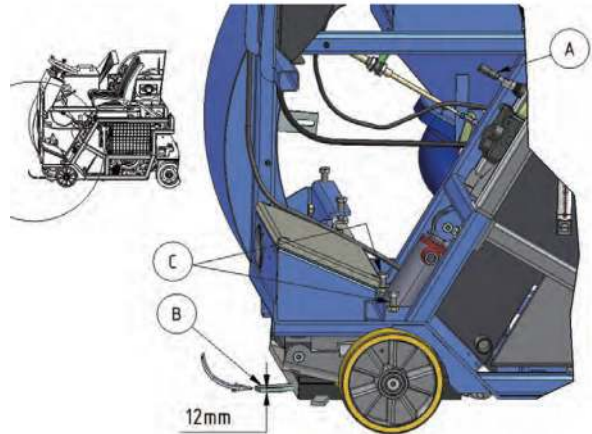
7.6 Adjusting Magnets and Seals

The adjusted height of the magnetic seals should be set equally at about 12 mm and parallel to the surface.

For the height adjustment, a 12mm stainless-steel strip (B) is shifted below the magnetic seals.

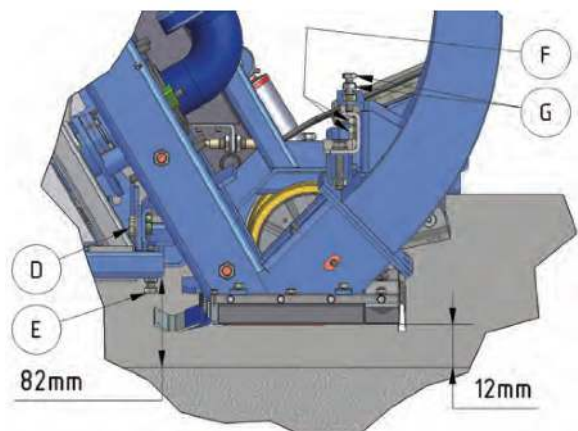
Adjust the height as follows:

1. Lift the machine with the lifting cylinder, pulling back the lever (A).
 2. Loose the two adjustment screws (C).
 3. Lower the machine onto the stainless-steel strip, as the front wheels smoothly touch the ground.
 4. Tighten the screws until they stop at the wheel bracket and then secure their positions with the lock nut.
 5. Finally lift and lower the machine and check the distance between floor and magnets.
- The setting depends on the structure of the surface to be treated, in general the rougher the surface the lower the setting.
 - Working on steel means to set it down as far as possible.
 - The height of the brush seals should be maximum 1 mm above the surface. The adjustment is possible within the slots of the seal elements.



Basic settings of the blast head after changing of blastrohousing or rebound:

1. Adjust the height of 82 mm between underside of the frame and the surface.
2. Align the blasthead in a horizontal position with a distance of 12 mm between magnets and surface.
3. Adjust the height with the setting screws, two at the underside of the Frame (E) and two on the inner side of the rebound (G), securing its position with the lock nut.
4. Finally tight the four fixing screws (D+F).



7.7 The Belt Drive

The belts are designed for the installed drive power. Forcing the drive to produce a higher output by overtensioning the belts results in belt breaks, bearing damage, and lower efficiency. A low belt tension results in slippage causing an increased belt temperature and premature destruction of the belts.

Temperatures exceeding 70°C for a long period reduce the service life and performance of the belts. The grooves of the belt pulleys must be free from rust, grease, dirt, and any visible damage.

The use of belt wax or similar substances to increase the friction coefficient is unnecessary and damages the belts. Avoid any contaminations of oil, grease, or chemicals.

In order to grant a perfect output transmission, the belt drive needs continuous observation.

7.8 Fitting Belts



Remove the belt guard only when the blast wheel motor is at a standstill and the main switch of the blast machine is in Safety Off Position as described in chapter 2.

1. Release the tension of the belt drive and loosen the central screw of the tensioner.
2. Insert the V-belt in the V-belt pulley grooves manually without forcing the belt.
3. Tension the belt as described in the following section.
4. Fasten the required protection equipment that was fitted on machine before.

7.9 Belt Tension

To achieve a maximum power transfer and live time the correct setting of the belt tension is essential. Often belts are set with the wrong tension and fail before normal service time. Belts that are set with too much tension may cause bearing problems on motors or bearing units.

Tension the belts as described below:

1. Mount the tensioner and push the tensioning roller to the belt. Tighten the flange screw slightly.
2. Grip the housing (2) with flat-wrench (SW30) and set needful pre-tension by rotating the housing in the required direction.
3. Tighten the central screw.

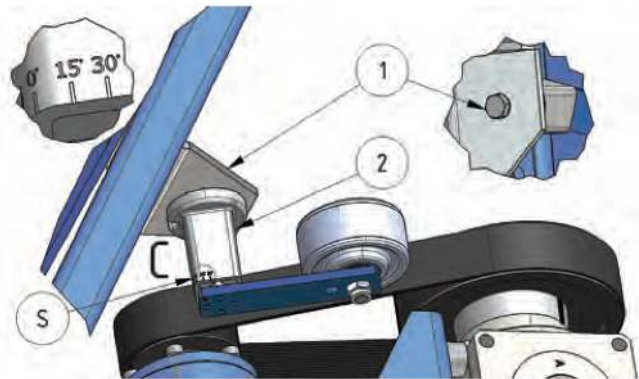


Table with required angles of tensioners for belt tension:

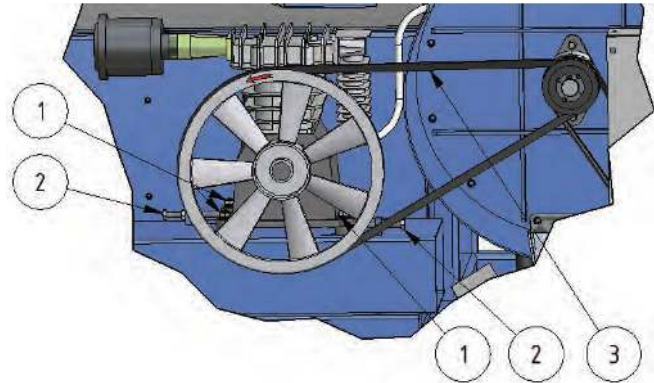
Belt Drive	Belt	Angle
Engine – Gearbox	Timing belt	20
Gearbox – Bearing unit	Poly-V belt	17-20
Gearbox - Fan	Poly-V belt	15-18
Engine – Hydr. pump	Poly-V belt	13-15

7.10 Belt Drive Compressor



Remove the belt guard only when the engine is at a standstill and the key of the ignition/ starter switch is removed. See Safety Off Position as described in Chapter 2.

1. Remove the belt guard.
2. Loosen the compressor fixing nuts (1) and release the belt tension by reducing the distance between the belt pulleys using the adjuster screws (2).
3. Insert the V-belt in the V-belt pulley groove manually without forcing the belt.
4. Tension the V-belt by increasing the distance between the belt pulleys using the adjuster screws.
5. Tighten the fixing nuts.
6. Replace the belt guard.



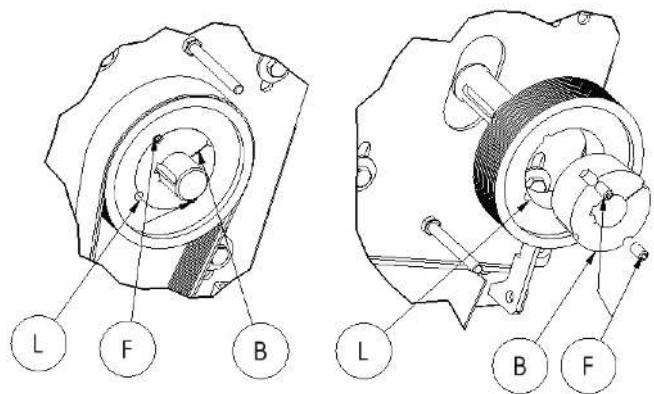
7.11 Belt Tension Compressor

To achieve a maximum power transfer and live time the correct setting of the belt tension is essential. Often belts are set with the wrong tension and fail before normal service time. Check the correct pre-tension (3) by pressing down the belt. The distance the belt can be pressed down should be 3-4 mm.

7.12 Taper-Lock Bushes

Taper locks are used to shrink-fit hubs on shafts. Mounting and demounting only requires a screw driver DIN 911 (Allen key). Tightening and loosening is affected with the same threaded pins or screws.

Taper locks are cylindrical on the inside, tapered on the outside, and slit longitudinally. The smaller bushes 2 and 3 have in the large face their cylindrical blind holes in parallel to the axis, which, however, are only placed halfway in the bush material. The other halves of these blind holes are threaded and are placed inside the hub.



Threaded pins or screws (F) are screwed to the stop in the boreholes using an Allen key. When the screws are tightened further using a certain amount of force the hub is drawn up to the tapered bush (B) which is pressed onto the shaft with great force.

Demounting Taper-lock Bushes:

1. Demount the screws (F) in the belt pulley
2. Lubricate the thread and the tip of the screw and turn it into the bore (L) as shown.
3. Turn the screw until the taper lock (B) gets loose inside the pulley and the assembly is loose on the shaft.
4. Take the pulley and the taper lock from the shaft.

Mounting Taper-lock Bushes:

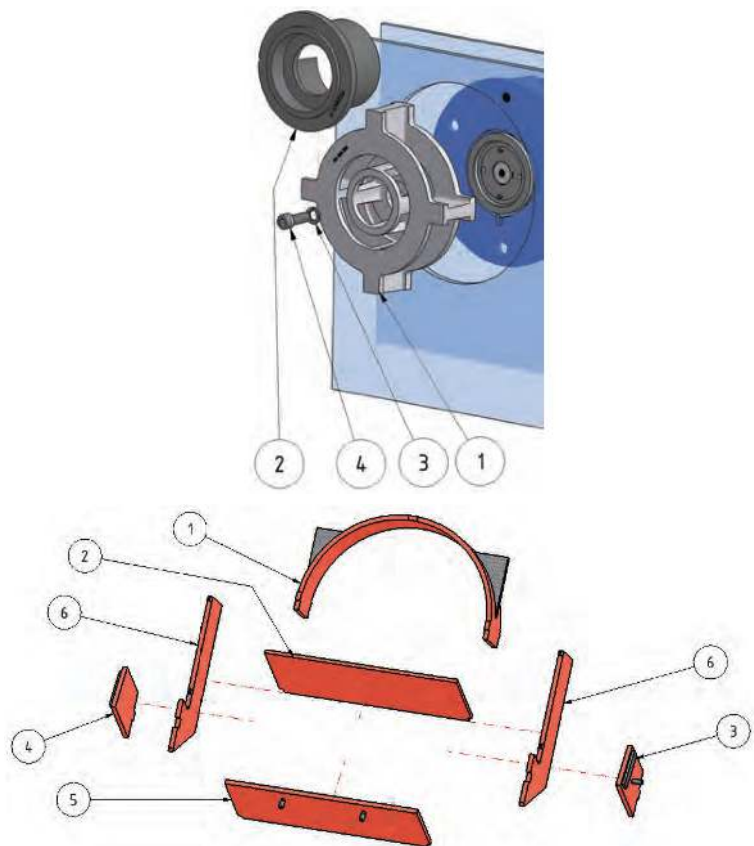
1. Assure that all contact surfaces are free from dirt and oil.
2. Place the taper lock into the pulley.
3. Lubricate the screws slightly and insert them into the respecting threaded holes.
4. Clean the shaft, shift the pulley with the taper lock, as one unit, onto the shaft, and position the assembly. Note, that first the taper lock is fixed on the shaft before the pulley reaches its final position on the bush.
5. Use an Allen key to fit the screws
6. Knock the frontal face of the bush lightly with a hammer to make sure that the bush is seated in the centre of the pulley (use a mandrel to avoid any damages).
7. Now tighten the screws.
8. Repeat the alternating hammering and tightening until all screws fully tightened.

7.13 Wear Parts - Blast Housing**The Wheel Kit**

- | | |
|---|--------------|
| 1 | Blast Wheel |
| 2 | Control Cage |
| 3 | Lock Washer |
| 4 | Bolt Liners |

Liners

- | | |
|---|----------------------|
| 1 | Top Liner |
| 2 | Top Plenum Liner |
| 3 | Side Liner Plenum RH |
| 4 | Side Liner Plenum LH |
| 5 | Bottom Plenum Liner |
| 6 | Side Liner |

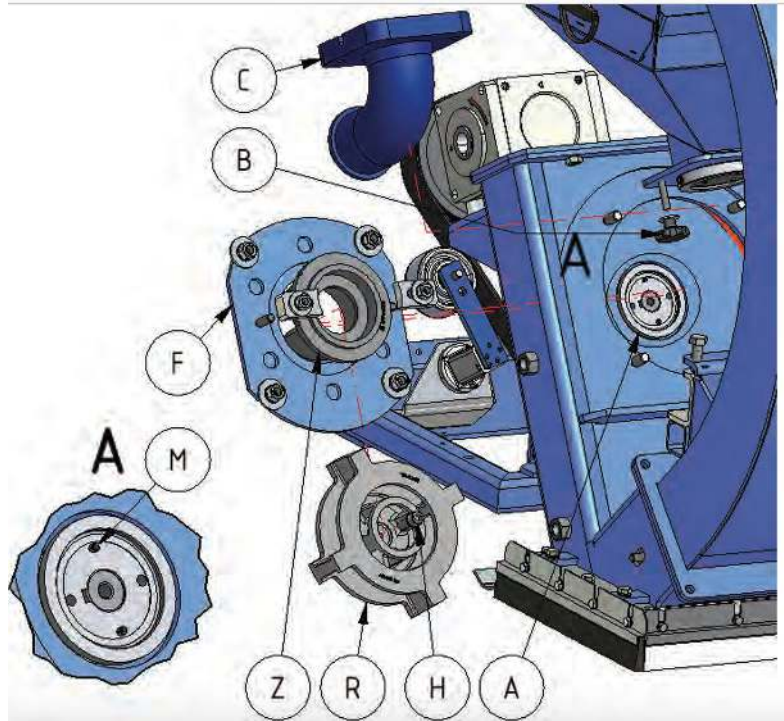


7.14 Replacing the Wheel Kit

The Wheel Kit consists of Blast Wheel, Control Cage, Lock Washer, and Bolt.

Demounting:

1. To remove the feed spout (C), loosen the knurled-nuts (B), pull the feed spout downward, and remove the feed spout out of the housing.
2. Loosen the cage clamps and remove the control cage (Z).
3. Unscrew the 4 screws of the front cover plate (F) and remove.
4. Unscrew the fixing screw (H) of the blast wheel (R) while holding the blast wheel still. Take the blast wheel out of the housing.
5. Check the wheel adapter (A) for wear and replace if necessary.



Mounting:

1. Clean all threads and use a new blast wheel fixing screw.
2. Place the blast wheel (R) on the wheel hub (A) through the blast housing opening assuring the blast wheel fits with the adapter pins (M) in line.
3. Tighten the blast wheel with the fixing screw (H).
4. Fix the front cover plate (F) using the four washers and nuts.
5. Insert the control cage (Z) in the center (see Chapter 7 "Setting the blast pattern") and clamp the control cage with the cage clamps so that the blast wheel can rotate freely.
6. Turn the blast wheel manually. It must rotate free.
7. Place the feed spout (C) in the housing and fix it with the knurled-nuts (B).

7.15 Replacing the Liners

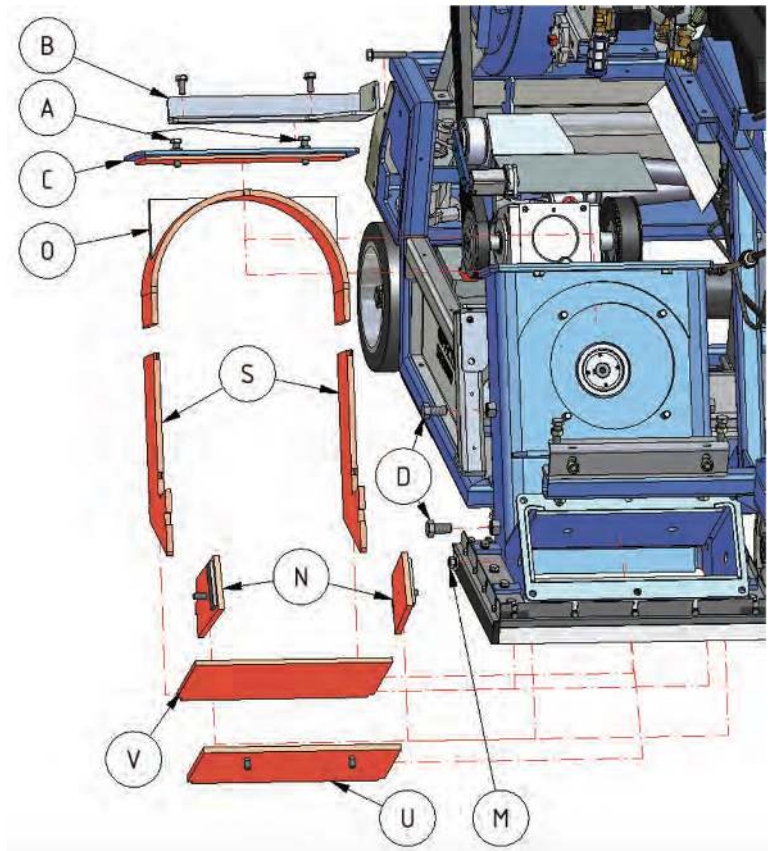
Demounting:

1. Pull up the lifting lever until the piston rod is completely extended.
2. Secure the machine against unintentional lowering.



Crushing danger! Be sure to support the machine with a beam.

3. Bring the machine into the Safety-Off position (see Chapter 2).
4. Remove the protection covers on the right side of the machine.
5. Remove the front-plate and wheel-kit (see Chapter 7).
6. Loosen the setscrews (A) of the top liner.
7. Take off the screws of the bracket framehousing (B) and the cover (C) and remove them.
8. Loosen the setscrews (D) of both side-liners.
9. Remove the top liner (O) towards the top.
10. Loosen the nuts (M) of the rebound side-liners (N) push the liners inward.
11. Fully take off the nuts (M) and move both liners (N) downward away from the housing.
12. Push both side-liners (S) towards the bottom out of the housing.
13. To remove the rebound bottom (U) and top liner (V), take off the nuts and pull both downward out of the housing.



Mounting:

1. Before fitting any new liner, check that all threads are clean of dirt and abrasives. Clean where necessary.
2. First place the bottom (U) and top rebound liner (V), Put the nuts on, but do not tighten them.
3. Place both side liners (S) into the housing.
4. Then place both side liners (N) in the rebound area. Put the nuts on, but do not tighten them.
5. Place the top liner (O) to the top.

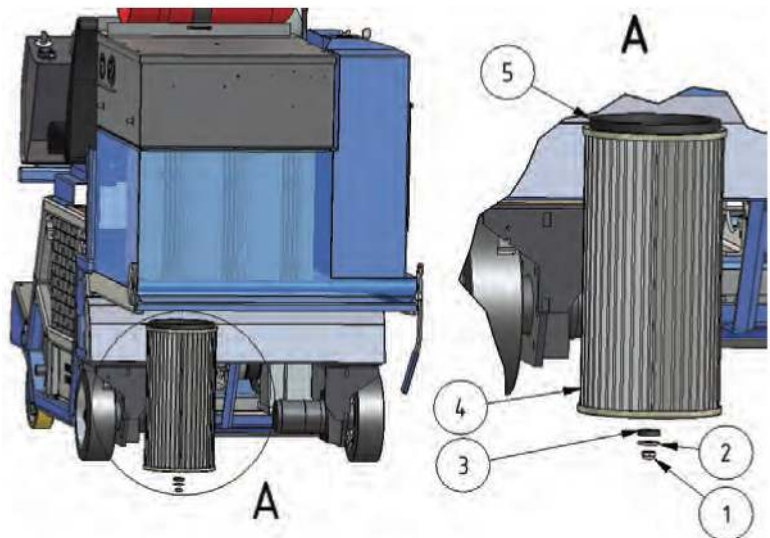
6. Close the cover (E), mount the bracket frame-housing (B) and fit the screws. Place the setscrews (F) on the cover so the top liner is supported in the center.
7. Slightly tighten the setscrews (D) of the side liners.
8. Force the side liners (S) upwards so there is no gap between top and side liners. If necessary, adjust top liner with the set screws (F) to the RH or LH side. Tighten up the set screws (D) and all other liner screws.
9. Fit the wheel kit and front plate as described in Chapter 7.
10. Place the protection covers.
11. Remove the beam under the frame and lower the machine to the working position.

7.16 Replacing Filter Cartridges



Before you start changing the cartridges, you should clean as described in Chapter 6.3. After that, remove the dustbin.

1. Unpack the new cartridges and place them aside. Use the packing for a dust free transport and storing of the older cartridges.
2. Remove the locknut (1), steel-washer (2) and rubber seal (3) under the cartridge and pull down the cartridge (4).
3. Place the cartridge in the packing and seal it.
4. Place a new cartridge (4) on the holder and push on the rubber seal (3) to prevent the cartridge from falling down again.
5. Then place the steel-washer (2) and nut. Tighten the nut (1).
6. Ensure the cartridge (4) centered to the Venturi on top and the seal (5) **should not be fully compressed** when tightening the nut (1).
7. Tightening it too much will damage the cartridge! **Leave at least 5mm** between metal top of the cartridge and the upper plate of the filter housing.



7.17 Wear Parts - Filter Unit

To avoid unnecessary down time, IMPACTS Americas recommends to stock the following parts:

Part Number	Description	Qty.
306000002	Filter Cartridge	5
314000061	Compressor air inlet filter	1

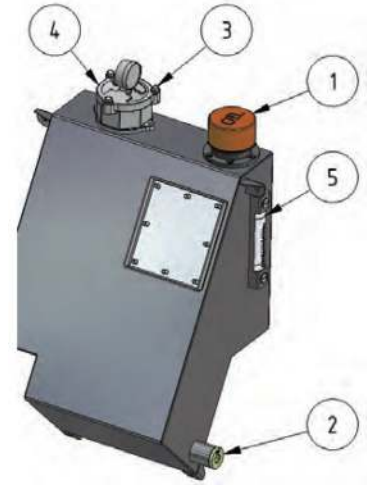
7.18 The Hydraulic Tank

Changing hydraulic oil filter:

1. Open cover (4) on hydraulic oil filter, loosen the three screws (3).
2. Remove hydraulic oil filter and change.
3. Insert hydraulic oil filter and re-attach cover.

Changing hydraulic oil:

1. Unscrew cap (1) of the filler.
2. Unscrew oil drain screw (2) and drain oil into suitable container.
3. Replace the oil drain screw with a new seal.
4. Refill with hydraulic oil to the upper limit mark (5).
5. Close the filler with the cap.



Filling quantities:

Hydraulic tank	20 liters
Hydraulic system	26 liters (First fill)
Hydraulic oil	HLP 46

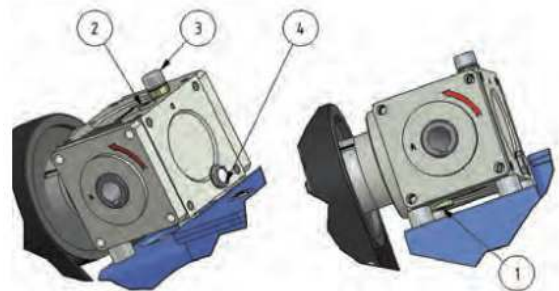


Catch any escaping hydraulic oil. Dispose of hydraulic oil and filter according to state and local regulations.

7.19 The Gear Box

Changing gear box oil:

1. Remove Poly-V belt of the blast wheel drive.
2. Unscrew plug (2).
3. Unscrew oil drain screw (1) and drain oil into suitable container.
4. Replace the oil drain screw with a new seal.
5. Clean the gear box valve (3).
6. Refill the gear box up to the lower edge of the oil-sight glass (4).
7. Close the gear box with the plug (2).



Filling quantities:

Gear box:	360 cm ³
Recommended oil:	Shell Omala S2 G 150 Fuchs Renolin CLP 150 Mobil Mobilgear 600 XP 150 Klüber Klüberoil GEM1 - 150

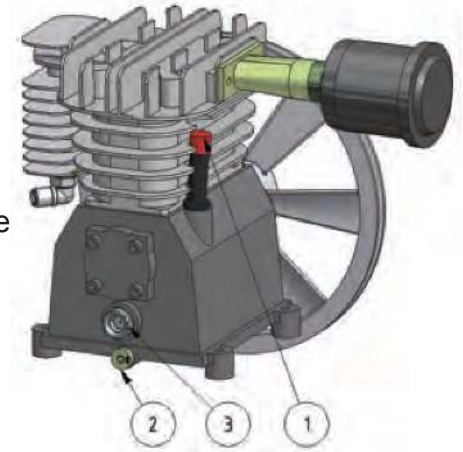


Catch any escaping gear box oil. Dispose of gearbox oil according to state and local regulations.

7.20 The Compressor

Changing Compressor Oil

1. Remove v-belt of compressor drive.
2. Loosen the four fixing nuts and the compressed air line.
3. Place the compressor on a flat surface.
4. Unscrew cap of the filler (1).
5. Unscrew oil drain screw (2) and drain oil into suitable container.
6. Replace the oil drain screw with a new seal.
7. Refill the gear box up to the middle of the oil-sight glass.
8. Close the compressor filler with the cap (1).
9. Refit the compressor to the machine (see chapter 7).



Filling quantities:

Compressor:	500 cm ³
Recommended oil:	API CC/SC SAE40



Catch any escaping compressor oil. Dispose of compressor oil according to state and local regulations.

Chapter 8.0 Electrical Systems

8.1 Tips for the Electronics

8.2 Tips for the Hydraulics

8.3 Fuses

8.4 Circuit Diagrams

8.1 Tips for the Electronics



Prior to any repair work on the machine and its drives, secure the machine against unintentional switch-on. Put the machine to its Safety Off Position as described in Chapter 2.

Electric spares need to be ordered with reference to the electrics circuit diagram within this chapter. If there is any doubt, you need to call your local IMPACTS service technician.

The electrical parts of the machine must be inspected regularly. Please note in particular the specified recurring inspections according VBG 4 or other local regulations. Defects such as loose connections or scorched cables must be rectified immediately. Call a skilled electrician or the IMPACTS customer service.



8.2 Tips for the Hydraulics

Prior to any repair work on the machine and its drives, secure the machine against unintentional switch-on. Put the machine in its Safety Off Position as described in Chapter 2.

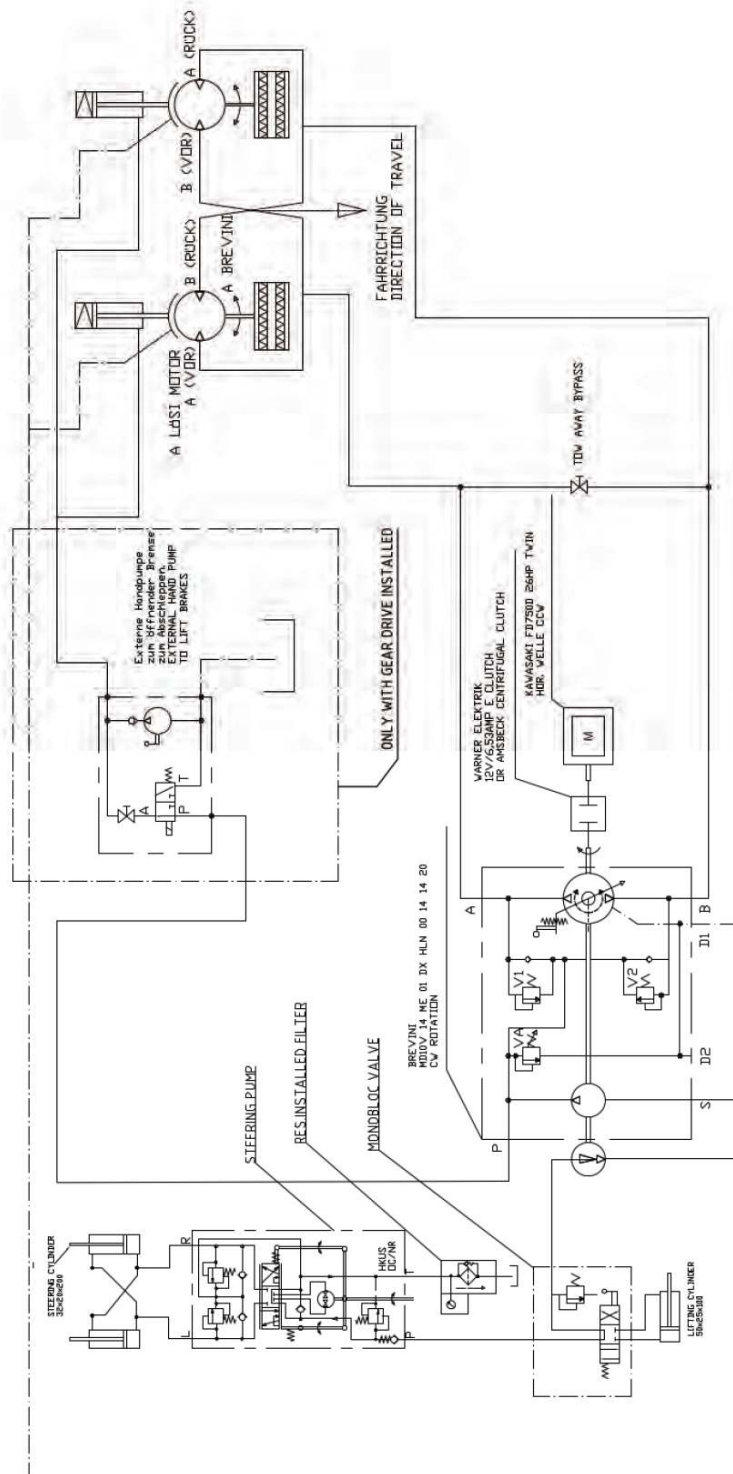
Hydraulic spares need to be ordered with reference to the hydraulic parts within the parts catalog. If there is any doubt, call your local IMPACTS service technician.

8.3 Fuses

Pos.	Function	Rated power
1	Starter	25 A
2	Light	5 A
3	L.P.G. system	7,5 A
4	Display, Control filter unit	5 A
5	Fuel system	3 A
6	Back-up alarm	7,5 A



Hydraulic System

[illegible]

Chapter 9.0 Error Diagnostics

9.1 Diagnosis of Failures - Blast Machine

9.2 Diagnosis of Failures - Filter Unit

9.3 Diagnosis of Failures - Motor

9.4 Diagnosis of Failures - Traction Drive

9.5 Diagnosis of Failures - Kawasaki Engine

This chapter enables the user to locate and to remedy simple faults, or the consequences of operating errors. If it was not possible to eliminate the fault by performing the remedial actions indicated below, please inform the IMPACTS Service, as more intricate faults can only be rectified by specially trained and qualified service staff.

9.1 Diagnosis of Failures - Blast Machine

Prior to any repair work on the machine and its drives, secure the machine against unintentional switch-on. Put the machine to its Safety Off Position as described in chapter 2.6

Fault	Possible cause	Remedial action
Unusual Vibrations	Uneven wear of the Blast wheel, Unbalance due to broken parts or blades.	Replace Blast wheel Set. Check separator and all other sections of the machine. Remove all broken parts.
	Wheel hub worn out.	Replace Wheel Hub
	Drive Shaft bended.	Replace Shaft or complete Bearing Unit
Unusual Noise	Low Clearances or bad adjustments of turning parts.	Check parts adjustments (Blast wheel and Control Cage).
	Loose or lost screws.	Check screws and bolts to be fitted correctly, tighten where necessary.
	Shrieking wheels	Replace if worn.
Reduced performance or no performance.	Insufficient flow of abrasive in front of the Blast wheel	Clean wire mesh, Fill up abrasive. Check feed spout to be clean
	Loose valve lever.	Tighten up set screw
	Valve adjustment	Adjust valve lever and valve disk.
	Blast wheel or control cage.	Blast wheel or control cage worn out. Replace worn items.
	Belt Tension	Check and adjust

Fault	Possible cause	Remedial action
Reduced performance or no performance.	Too much abrasive admitted when switched on. Feed motion too fast.	Ensure motor got max speed before opening the valve. Reduce speed.
Dumping or loosing Abrasive.	Elevation adjustment of magnets. Magnets lost field. Poor Abrasive quality. Blast Wheel worn. Worn seals Too much dust and sand in system	Adjust distance between magnets and surface. Replace magnets Use Quality abrasives. Replace Blast Wheel. Replace seals Check filter
Too much dust and other particles in storage.	Insufficient air flow towards filtration unit.	Check rated performance of the filter unit, check all seals, check dust hose, check differential pressure and replace filter elements if pressure too high
High abrasive consumption	Throttle valve filter unit Abrasive level to high.	Adjust the throttle valve, reduce airflow until any abrasive is sucked off. Drain abrasive to correct level
Excessive wear in blasthousing and rebound	Wrong control cage position	Adjust blast pattern.
Machine remained stationary.	Drive speed to low. Blast head scraped along the ground.	Adjust drive speed. Adjust distance between magnets and surface.

9.2 Diagnosis of Failures - Filter Unit

Fault	Possible cause	Remedial action
Dust exposure (clean-gas side)	Filter cartridge(s) damaged	Replace filter cartridge(s)
Dust exposure (raw-gas side)	No vacuum	Check fan
	Throttle valve closed	Open throttle valve
	Filter cartridge is blocked	Check differential pressure max. 1,5 kPa
	No pulse cleaning	Check Timer board, fuses and valves
	Dust Bin not correct fitted	Check seal and proper seating
Unusual Vibrations	Dust hose damaged	Replace dust hose
	Imbalance through dust deposits on the fan blades.	Clean the fan blade.
	Loose or lost screws.	Check screws and bolts to be fitted correctly, tighten where necessary.

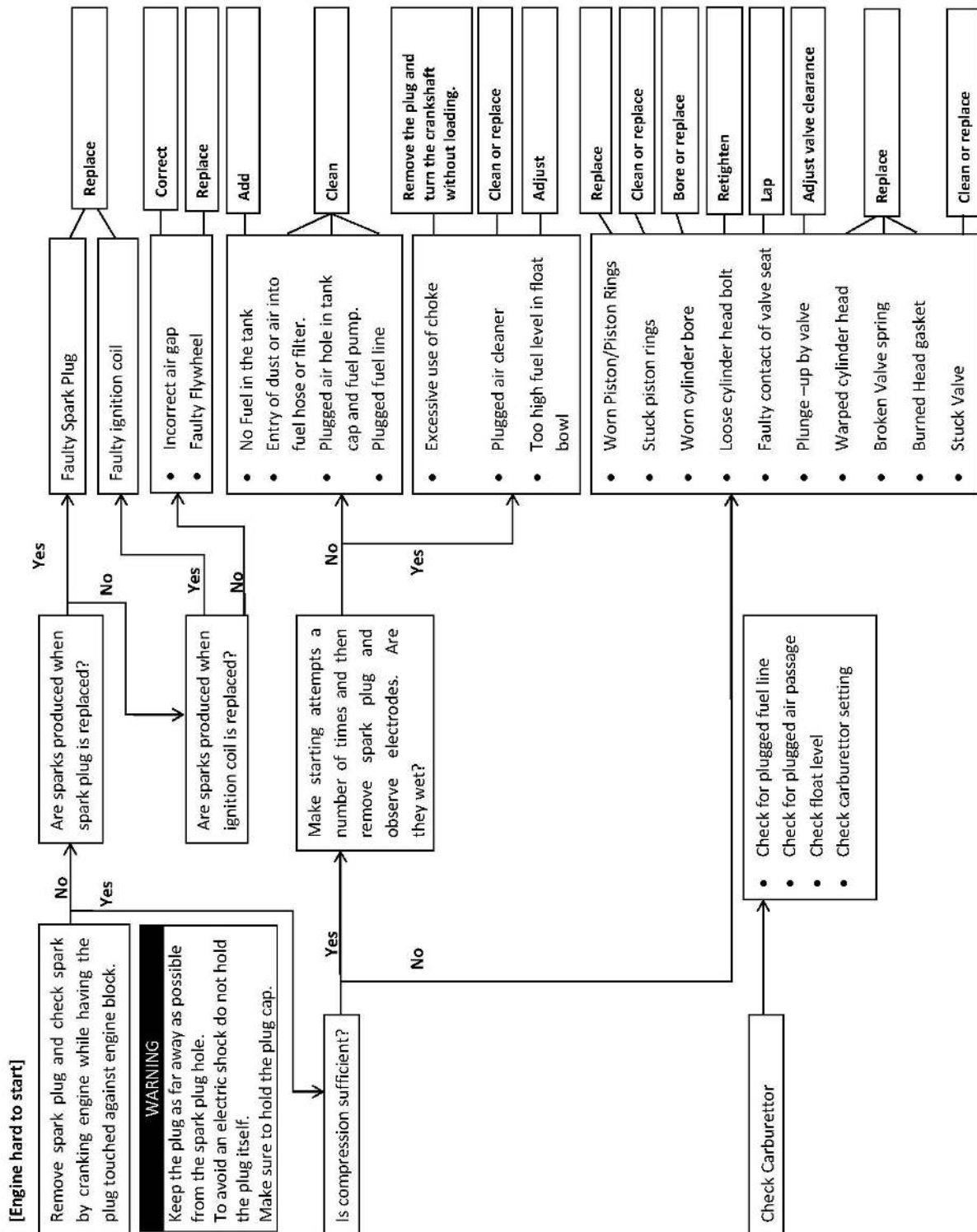
9.3 Diagnosis of Failures - Motor

Fault	Possible cause	Remedial action
Starter does not turn	Battery excessively depleted.	Check Battery charging condition and recharge, if required.
	Battery connecting cable loose, or pole terminals oxidised.	Clean and grease the pole terminals. Tighten the battery connecting cable.
	Starter cable loose or broken	Check the starter cable. Tighten or replace, as required
	Starter solenoid switch binding	Check, whether the solenoid switch functions audibly.
Engine does not start	Air filter contaminated	Clean or replace the air filter
	Bowden cable defective or disengaging	Check the bowden cable
	Spark plugs damp, oily or loose	Dry, clean or tighten the spark plugs.
	Spark plugs defective	Replace the spark plugs.
	Further causes in the case of L.P. Gas machines Stop valve of L.P. Gas bottle closed	Open stop valve
	L.P. Gas bottle empty	Replace L.P. Gas bottle
Engine oil pressure warning lamp alight during operation	Engine oil level low	Check engine oil level and top up, if required.
Engine temperature warning lamp alight during operation	Engine oil level low	Check engine oil level and top up, if required.
	Radiator contaminated	Clean the radiator.
	Coolant level low	Check the engine cooling system for leaks, or top up with coolant, if required.
	Slipping ventilator V-belt	Check the v-belt tension and retighten or replace, as required.

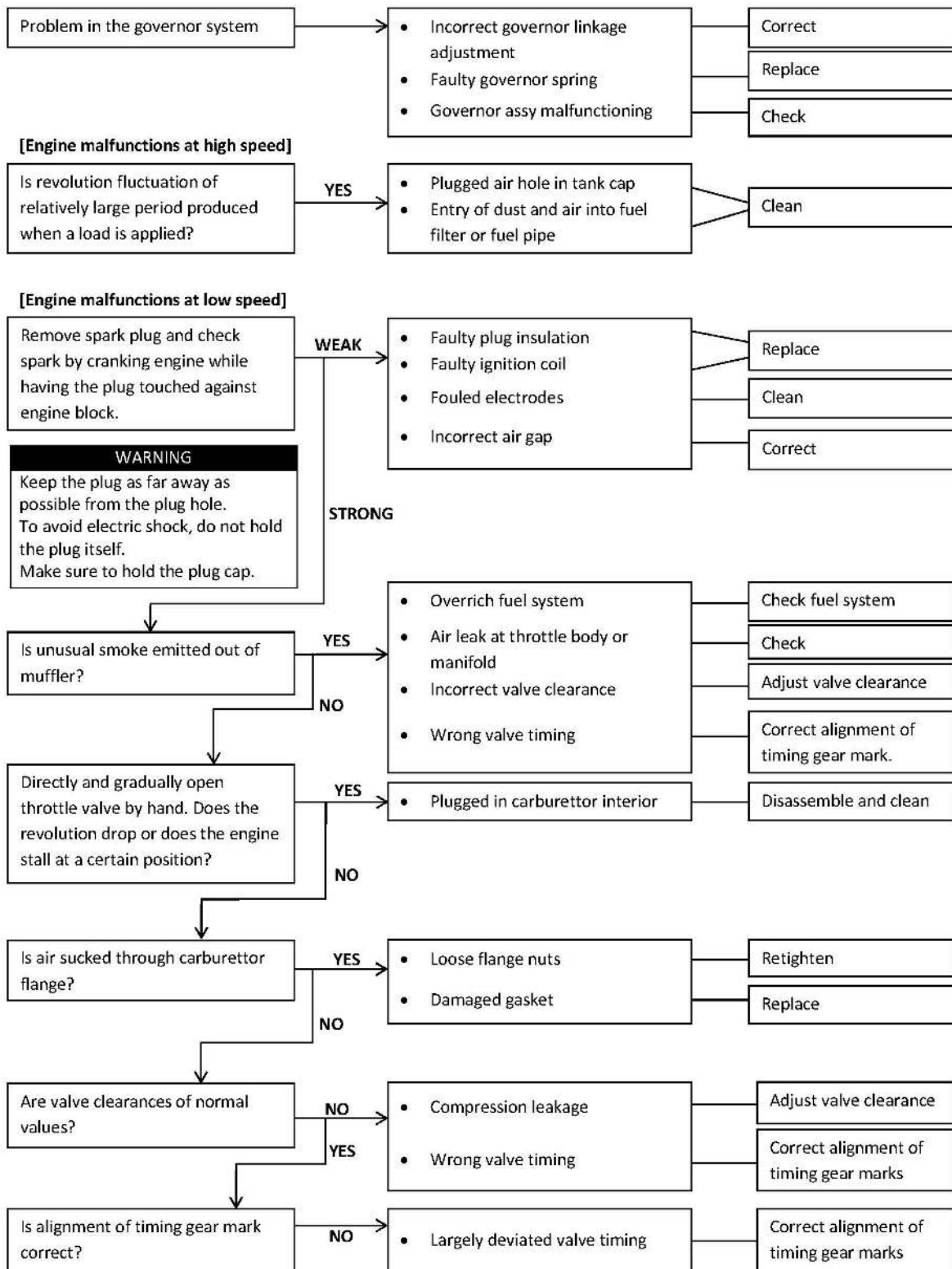
9.4 Diagnosis of Failures - Traction Drive

Fault	Possible cause	Remedial action
Engine running, but machine does not move	Bowden cable defective or disengaging	Check the bowden cable
	Hydraulic oil level low	Check hydraulic oil level and top up, if required
Steering sluggish	Check Steering linkage and lever	Replace worn or damaged parts, if required.
Steering play excessive	Air in steering system	Check the hydraulic oil level and top up, if required. Following this, turn the steering wheel several times from end stop to end stop.

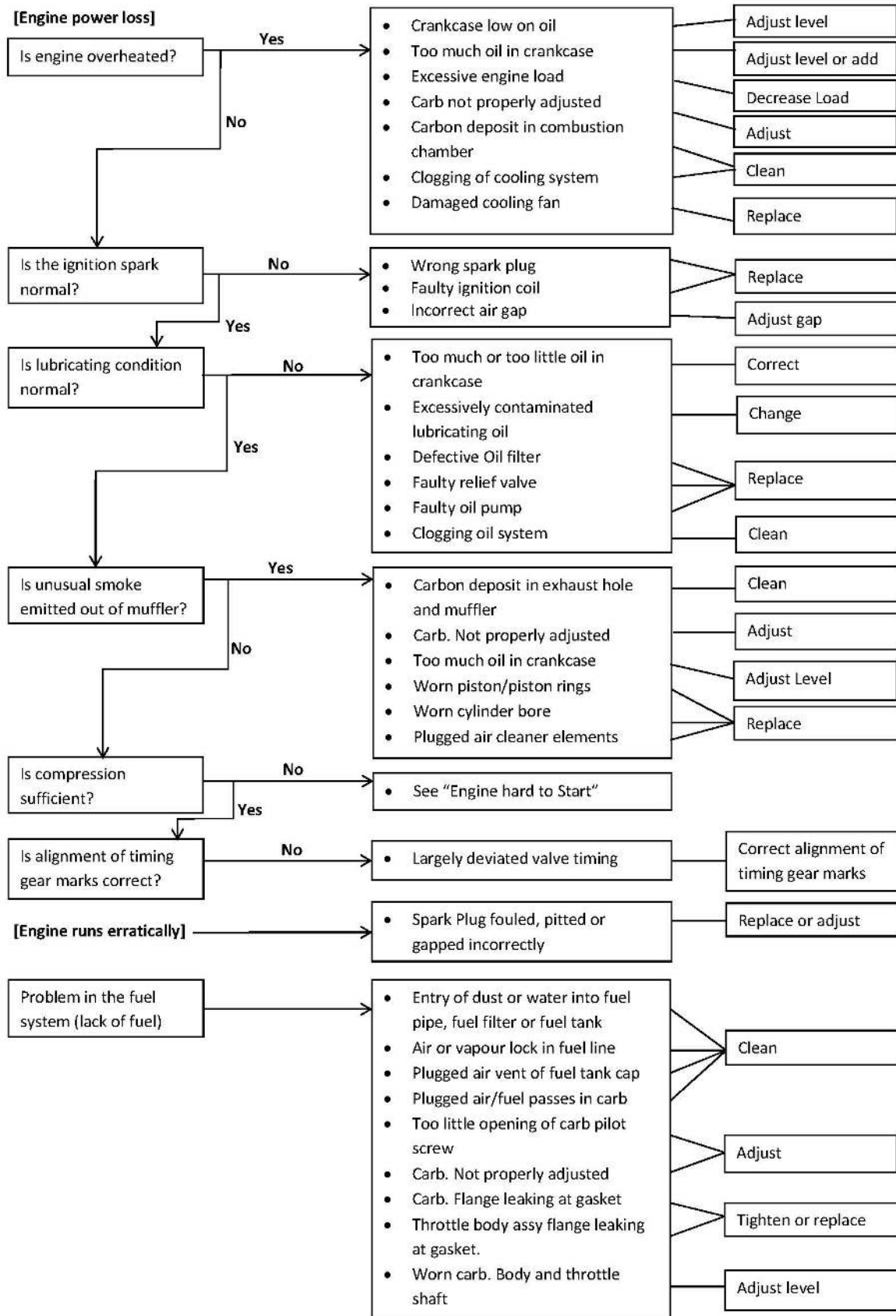
9.5 Diagnosis of Failures - Kawasaki Engine



Kawasaki Engine



Kawasaki Engine

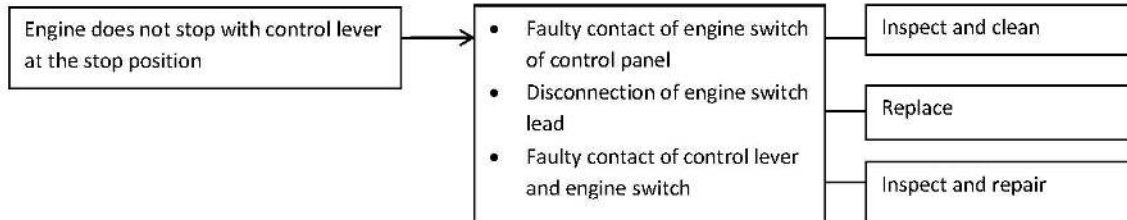


Kawasaki Engine

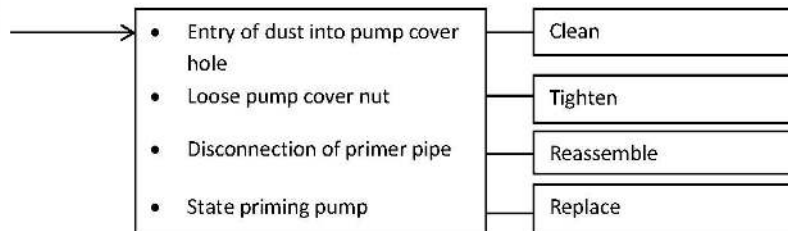


Kawasaki Engine

[Engine hard to stop]



[Faulty operation of priming pump] (Priming start Model)



Kawasaki Engine

Starter Motor Troubleshooting Guide

1. Disconnect spark plug caps from the spark plugs.
2. Turn engine switch to "START" position and check condition.

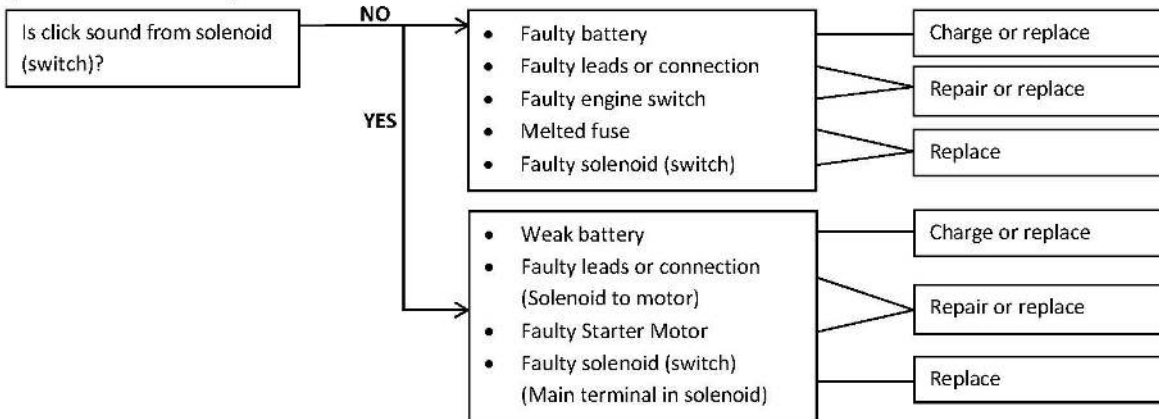
WARNING

Engine may be cranked in this test. Do not touch any rotating parts of engine and equipment during test.

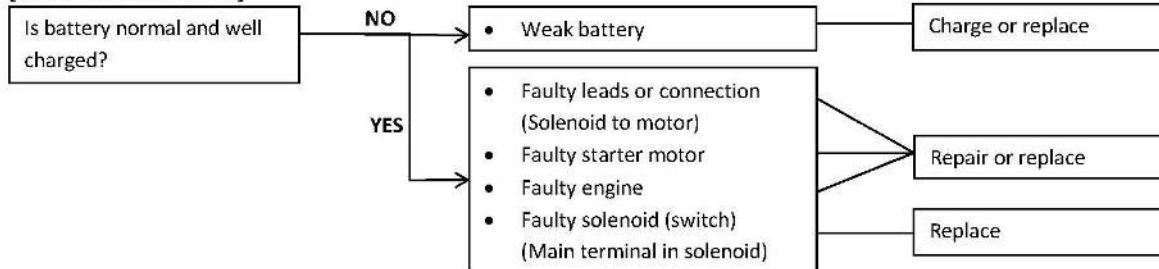
CAUTION

If starter does not stop by engine switch OFF, disconnect negative (-) cable from battery as soon as possible.

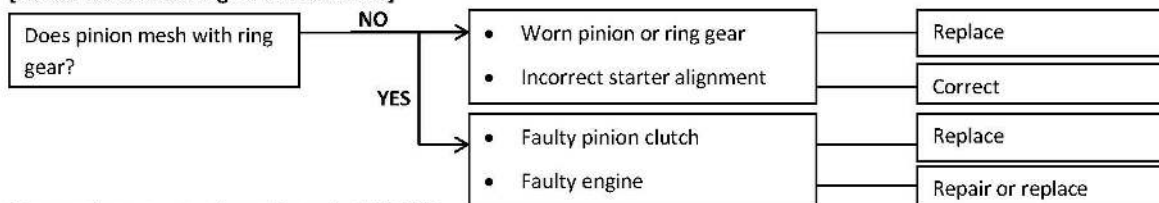
[Starter does not rotate]



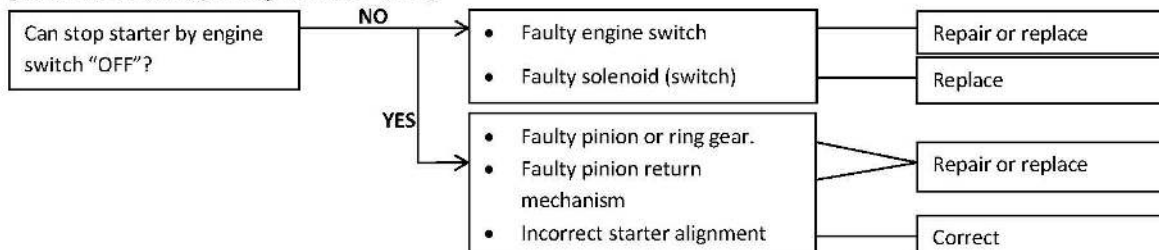
[Starter rotates but slow]



[Starter rotates but engine can not crank]



[Starter does not stop in engine switch "OFF"]





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