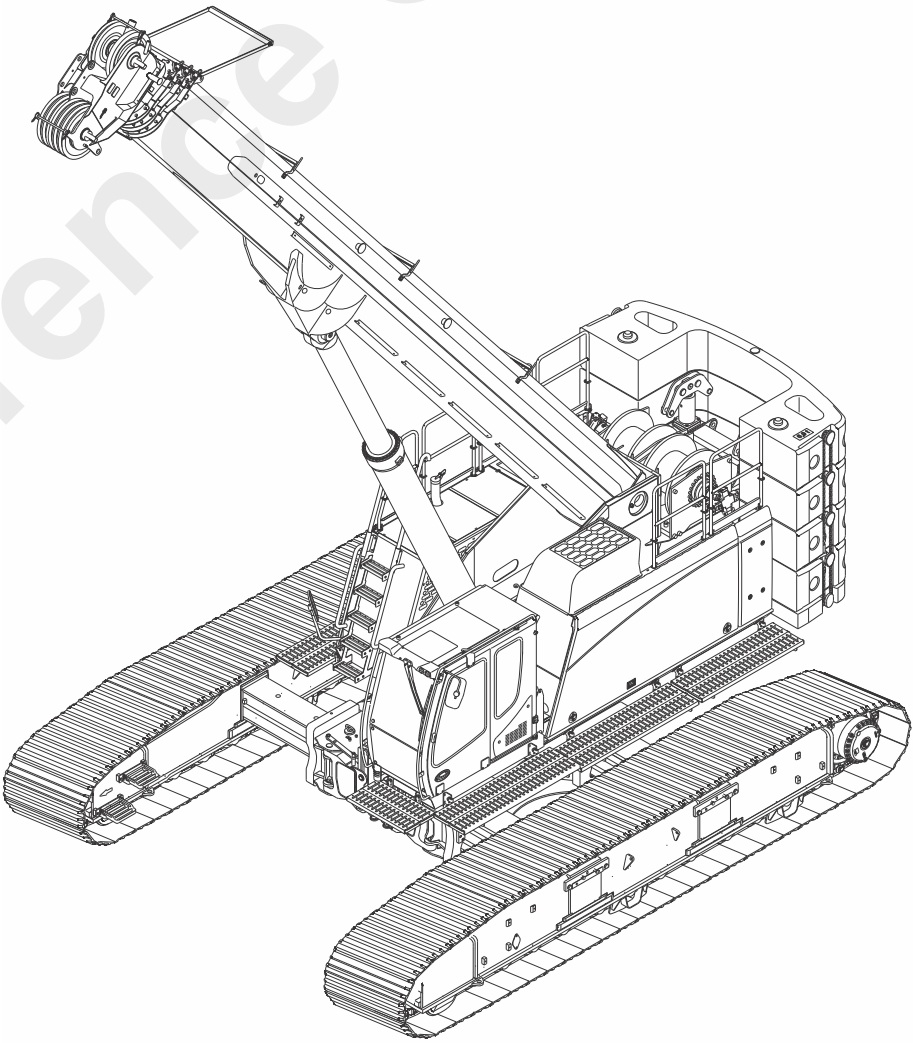
Maintenance manual

GHC130

Read the manual completely prior to first operation!



Translation of the original

Published 8-03-2015, Control # 566-01

Manitowoc Crane Care

- Only the crane owner or his representative may release the machine for operation, after maintenance tasks.
- Tasks on the machine's electrical equipment must only be executed by a qualified electrician.
- Work on undercarriage, braking and steering systems must only be executed by specialists trained for these tasks.
- Work on hydraulic devices must only be carried out by personnel with specific knowledge and experience in the area of hydraulic systems.
- No welding tasks whatsoever may be carried out on the device without consultation with the manufacturer.

WARNING

Risk of severe burns from hot parts and hydraulic oil.

Contact with hot hydraulic system parts or hot hydraulic oil can cause severe burns.

➢Avoid contact with hot parts.

➢Wear protective clothing and protective gloves.

WARNING

Risk of serious injury from pressurized hydraulic oil.

Opening the hydraulic system can cause pressurized hydraulic oil to eject and result in serious injury.

➢Wear protective clothing and protective gloves.

1	Start the machine and let it run for at least 15 minutes.
2	Set the tool on the floor and let the machine run to idle.
3	Thoroughly clean the area around the sampling point.
4	Remove the protective cap from the measurement connection (1) in Fig. 4.

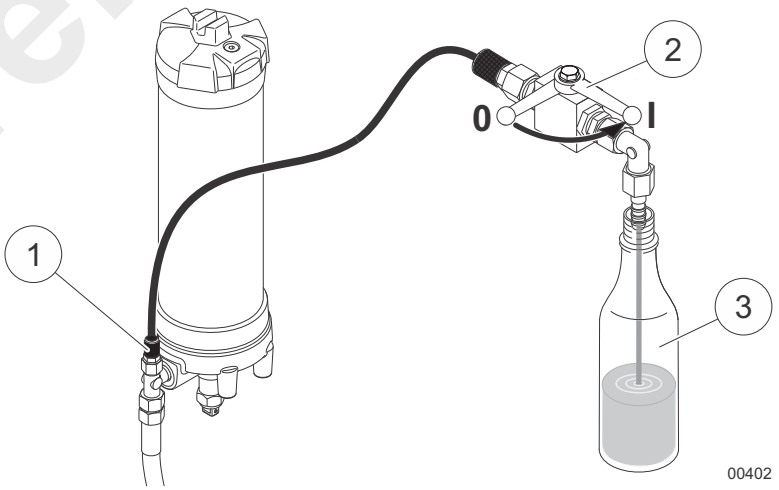


Fig. 4 Draining flushing oil

5	Connect the device for removing hydraulic oil samples (2) in Fig. 4 to the measurement connection (1) in Fig. 4 and drain around 0.25 l hydraulic oil into an empty container (3) in Fig. 4.
6	Dispose of the drained hydraulic oil in accordance with regulations.

3.1.1 Disposal of lubricants and operating fluids

NOTICE

Risk of environmental pollution due to improper disposal of solvents!

Improper disposal of lubricants and solvents contaminates the ground water.

➢Observe the applicable environmental protection regulations.

➢Properly handle and dispose of solvents and lubricants.

Excerpt from the *Disposal Directive 75/439/EEC*:

- "It is prohibited to mix spent oil with other waste."
- "Spent oils must not be mixed together."
- "Used oil filters must be collected, kept, transported and disposed of separately from other waste."

Information

Lubricants and other operating fluids must be disposed of at suitable collection points.

- In addition, any national environmental regulations applicable at the site of operation must be observed.

Batteries

Observe the safety instructions and protective measures when handling batteries.

Information

Do not dispose of batteries with domestic waste!
Dispose of defective batteries at a collection point for old batteries.

- In addition, any national environmental regulations applicable at the site of operation must be observed.

Replacing the air filter - Tier 4f

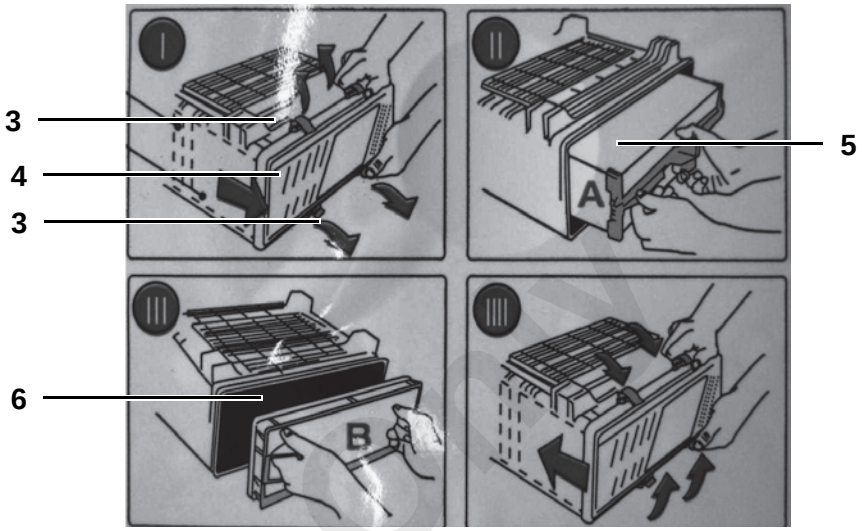


Fig. 10 Replacing the air filter

1	Set down loads and turn off the engine.
2	Climb up to the uppercarriage via the ladder.
3	Open the four locking clamps (3) in Fig. 10 of the air filter cover and remove the air filter cover.
4	Pull out the main element, Primary (5) in Fig. 10, and the safety element, Secondary (6) in Fig. 10, and dispose of them properly.
5	Insert the new main element, Primary (5) in Fig. 10, and safety element, Secondary (6) in Fig. 10.
6	Fasten the air filter cover (4) in Fig. 10 using the locking clamps (3) in Fig. 10.

Information
Replace the main element and safety element, do not clean them! Danger of engine damage!

5 Hydraulic system

WARNING

Danger of injury due to loose hydraulic connection and hot hydraulic oil system!

Escaping hydraulic oil injures persons in the danger zone.

- ➢In the event of injury due to hydraulic oil contact a doctor immediately.
- ➢Ensure that the hydraulic system is de-pressurized before working on it.
- ➢De-pressurize the hydraulic system before starting maintenance any maintenance work.
- ➢Depressurize the pressure accumulator.
- ➢Only open hydraulic lines and threaded unions in de-pressurized status.
- ➢Only have maintenance tasks executed after the hydraulic oil system has cooled down.

Safety instructions

- Work on the hydraulic system may only be carried out by trained personnel with special knowledge and experience in hydraulics.
- Only trained MANITOWOC service personnel are allowed to adjust the hydraulic valves.
- Wear personal protective equipment (for example, hard hat, hearing protection, protective gloves, safety footwear).
- Only execute maintenance tasks when the engine is shut down and the fan wheel is at a standstill. The possibility of automatic start-up must be excluded.
- Before resuming operation, ensure that:
  - there are no objects (e.g. tools) in the area of the fan wheels or that no objects can fall into this area, e.g. due to vibration,
  - the protective devices have been installed.

5.6 Replacing the aeration filter

Clogged aeration filters allow unfiltered dust and dirt into the hydraulic system. This can cause damage to the hydraulic system (for example to the pumps) and increased hydraulic oil wear.

The aeration filter is located in the screw cap (1) of the filler neck. The aeration filter limits the positive pressure and vacuum in the hydraulic system that occurs during hydraulic work movements. To replace the aeration filter, the tank cover must be removed.

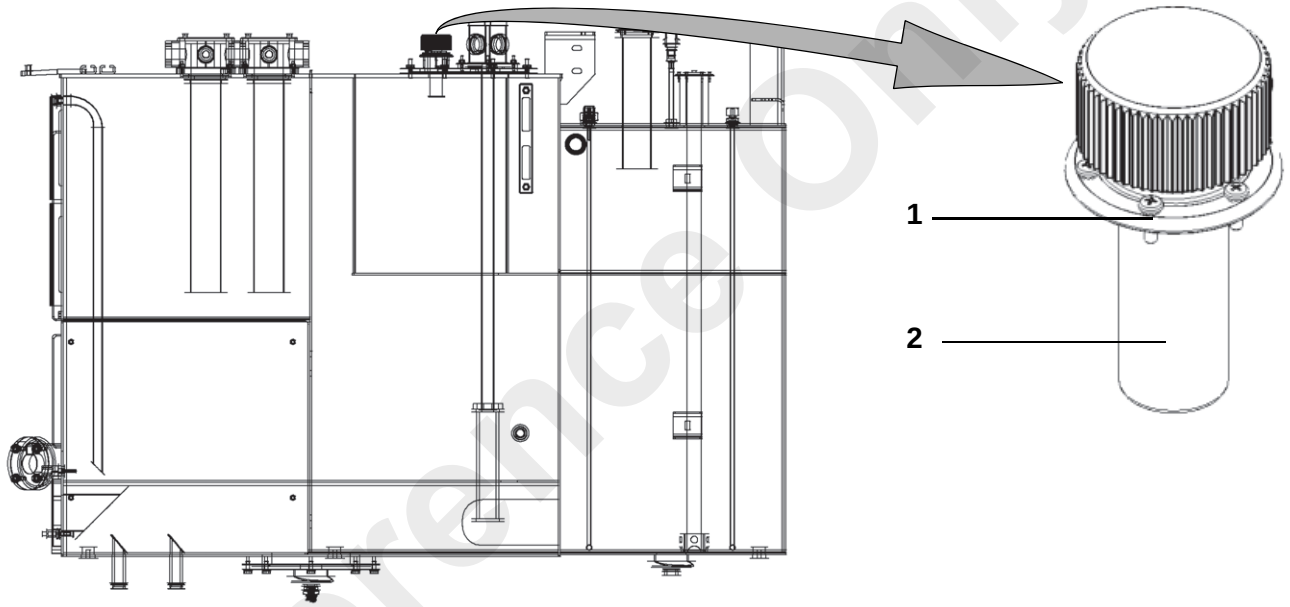


Fig. 20 Position of the aeration filter

1	Bolts
2	Filter element

1	Unscrew the bolts (1) in Fig. 20 of the aeration filter.
2	Pull out the aeration filter (2) in Fig. 20 and dispose of it as hazardous waste.
3	Insert a new aeration filter (2) in Fig. 20.
4	Screw on the bolts (1) in Fig. 20.

7 Undercarriage

7.1 Cleaning the frame and track frames

Safety instructions

- Do not use gasoline or flammable solvents to clean the undercarriage. Only commercially available solvents are permissible.
- Regularly clean and lubricate all pull-out elements (A).

1	Widen the track width to its maximum setting.
2	Remove accumulated contamination and old grease from all sides of the cross member (A) in Fig. 24 and the center frame (B) in Fig. 24. Clean surfaces with solvent!
3	Grease surfaces: Apply a thin coating of lubricating grease (C) in Fig. 24 using a brush.
4	Also grease the lubrication points on the middle bridge.

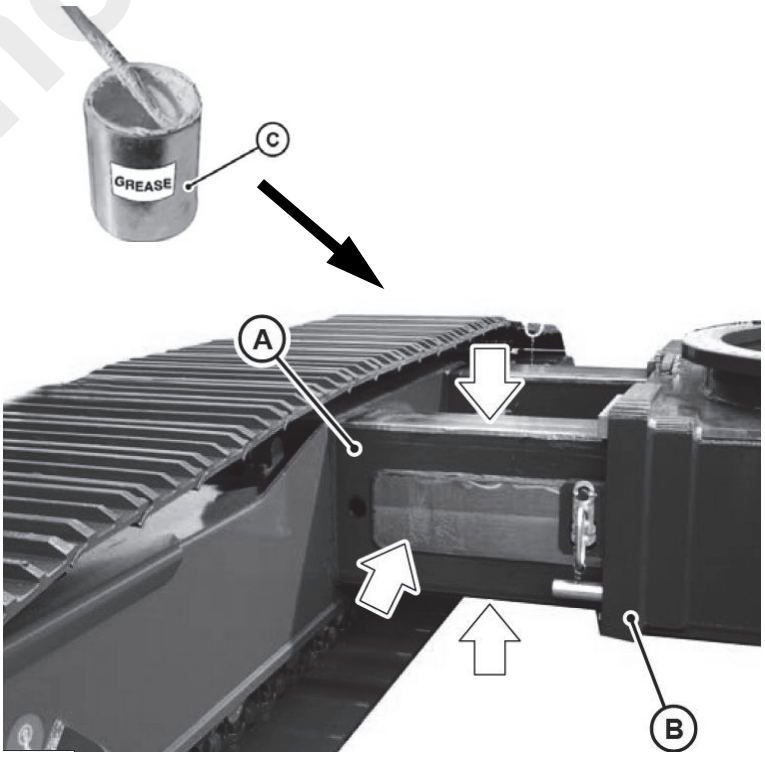


Fig. 24 Cleaning and lubricating the pull-out elements (A) and the center frame (B)

5	Thereafter, reduce and widen the track width so that the lubricating grease is optimally distributed.

8.2 Lubricating the slewing ring gearing

Lubricate the slewing ring gearing with the MANITOWOC gear spray, or via the optional *slewing ring lubrication* feature.

8.2.1 Gear spray

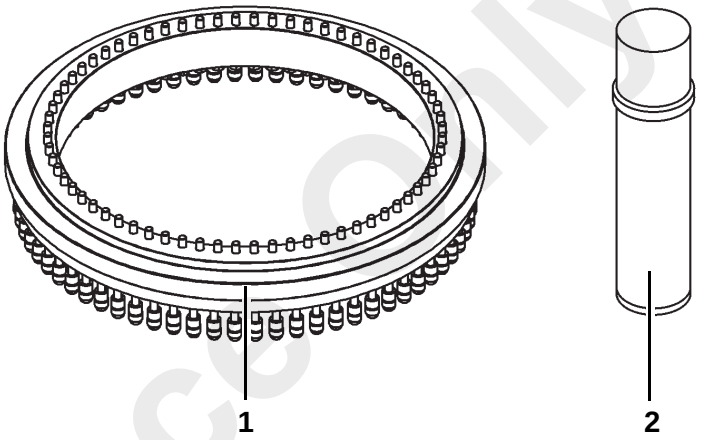


Fig. 33 Lubricate slewing ring.

1	Shut down the drive engine and safeguard it from being restarted.
2	Thoroughly clean gearing (1) in Fig. 33.
3	Check gearing of slewing ring and slewing ring pinion for wear and replace if necessary.
4	Spray gearing from an approximately 30 cm distance with MANITOWOC gear spray (2) in Fig. 33.
5	Slew the uppercarriage a number of times so that the lubricant is distributed uniformly over the gearing.

11 Automatic climate control

Safety instructions

Maintenance and repairs may only be performed by trained and authorized professionals.

Information
Check the following components monthly:

- Wiring
- Condition of the heating and cooling lines
- Flow of condensed water
- Filter for visible damage
- Plug for proper seating and soiling

11.1 Cleaning the recirculating air filter

Information
The recirculating air filter for the air conditioning system is located in the cab behind the driver seat.

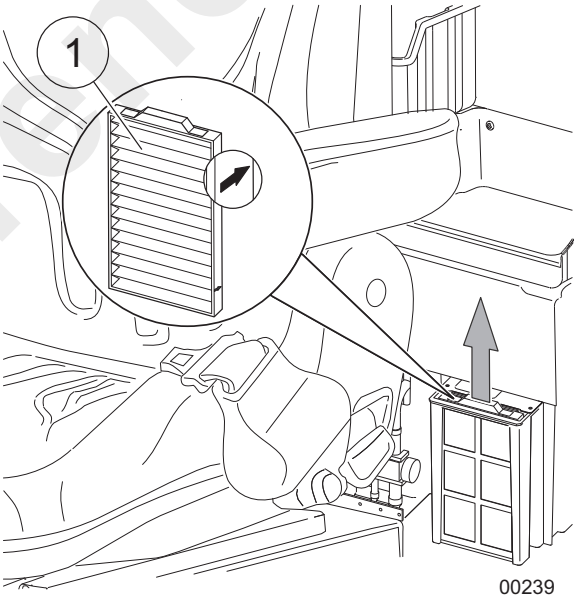
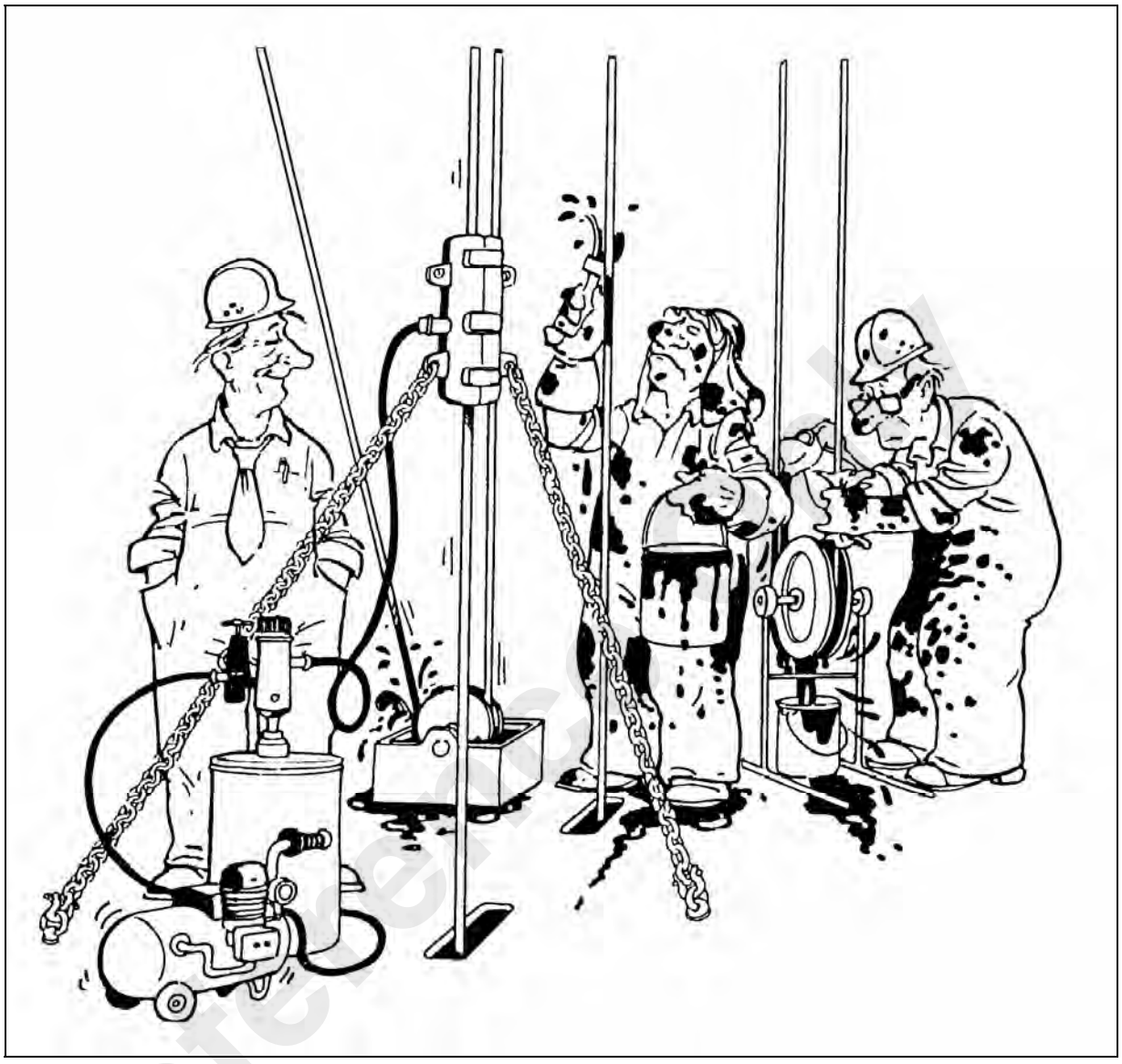


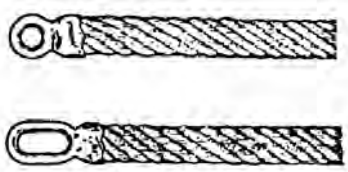
Fig. 39 Recirculating air filter

1	Use the handle to pull the filter element (1) in Fig. 39 out of the filter cartridge.
2	Beat out the filter element or carefully clean it with compressed air.



Handhabung, Montage und Wartung von Drahtseilen /

Handling, assembly and maintenance of wire ropes



Unproblematischer ist die Verbindung der Drahtseile durch zwei an den Enden angeschweißte Ringe oder Kettenstücke, die mittels Litzen oder dünnen Seilen verbunden werden.
Diese Verbindung besitzt eine zufriedenstellende Tragkraft, ist biegsam und verhindert die Übertragung von Drall vom alten zum neuen Seil. Bei Verwendung von zwei Litzen kann anhand der Zahl der Verdrehungen nach der Montage festgestellt werden, ob das alte Seil auf der Anlage stark verdreht worden ist.

The joining of the wire ropes by two rings or chains welded to the ends, which are connected by stranded wires or thin ropes, is less problematical.

This joint has a satisfactory load capacity, is flexible and prevents the transmission of twist from the old rope to the new one. When two stranded wires are used it can be established on the basis of the number of twists after assembly whether the old rope had been heavily twisted on the plant.

Eine weitere Möglichkeit stellt die Verbindung mittels Seilstrümpfen dar. Seilstrümpfe sind Geflechte aus Litzen, die über die Seilenden geschoben und an den Enden mit Klebeband gesichert werden. Bei Belastung ziehen sich die Seilstrümpfe zusammen und Halten die Seilenden mittels Reibung.
Beim Einziehen eines Gleichschlagseils ist zu beachten, daß die Seilstrümpfe sich trotz der Schnürspannungen wie eine Mutter auf einer Schraube auf dem Seil abdrehen können. Hier schafft ein vorheriges Umwickeln der Seilstrecken, die von den Seilstrümpfen gehalten werden sollen, mit einem starken Klebeband Abhilfe.

A further possibility is joining by rope stockings. Rope stockings are meshes consisting of stranded wires, which are pushed over the rope ends and secured at the ends by adhesive tape. The rope stockings contract under load and hold the rope ends by friction.

When drawing in a Lang lay rope it should be noted that despite the tying stresses the rope stockings may turn on the rope like a nut on screw. A remedy is provided by previously wrapping strong adhesive tape around the rope sections to be held by the rope stockings.

2.6 Das Auftrommeln unter Last / Winding on to drums under load

Für ein einwandfreies Spulen des Drahtseiles auf der Trommel ist es im Falle von Mehrlagenspulung, und hier besonders bei Verwendung der sogenannten Lebusspulung, von großer Wichtigkeit, daß die Drahtseile unter Vorspannung auf die Trommel gebracht werden.

To ensure that the wire rope is wound properly on the drum it is highly important in the case of multi-layer winding and in particular when using the so-called Lebus winding technique that the wire ropes are brought on to the drum under pre-tension.

Wenn die unteren Lagen zu locker sind, können sich die höheren Lagen unter Last zwischen tieferliegende Seilstränge einziehen. Dies kann zu gravierenden Seilschäden führen.

If the lower layers are too loose, the higher ones may be drawn in between lower rope sections under load. This may lead to serious rope damage.

Da der ablaufende Seilstrang an dieser Stelle vielleicht sogar festgeklemmt wird, kann dies beim Abtrommeln des Seiles plötzlich zu einer Spulrichtungsumkehr und somit zu einem schlagartigen Anheben der abwärts bewegten Last führen.

As the rope running off may even become jammed at this point, this may suddenly lead to reversal of the winding direction when unwinding the rope and thus to sudden lifting of the descending load.

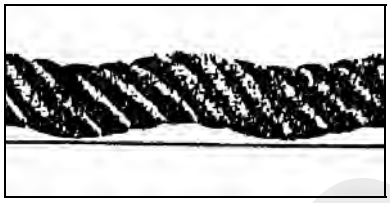
Die Vorspannung sollte in der Größenordnung von etwa 1 bis 2% der Mindestbruchkraft der Drahtseile liegen.

The pre-tension should be in the order of magnitude of about 1 to 2 % of the minimum breaking force of the wire ropes.

4) Abtrieb. Ein Drahtseil muß abgelegt werden, wenn seine statische Bruchkraft oder seine Betriebsfestigkeit durch metallischen Abtrieb übermäßig herabgesetzt wurde. Hier muß das Drahtseil bei einer Durchmesserverringerung von 10 % gegenüber dem Nennmaß abgelegt werden, auch wenn keine Drahtbrücke festgestellt werden.

4) Wear. A wire rope must be discarded if ist static breaking force or operating strength has been unduly reduced by metallic wear. The wire rope must be discarded in the cas of a 10% reduction in diameter compared to the nominal dimension, even if no wire breaks are detected.

5) Seilverformungen
Rope deformations

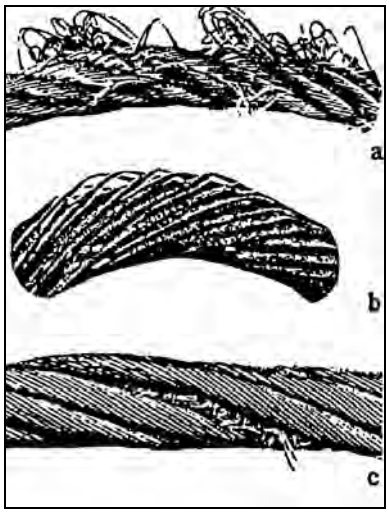


a) Korkenzieherartige Verformungen. Ein Drahtseil muß abgelegt werden, wenn eine korkenzieherartige Verformung eine Wellenhöhe von 1/3 des Seildurchmessers erreicht.

a) Corkscrew-type deformations. A wire rope must be discarded if a corkscrew-type deformation achieves an undulation height of one third of the rope diameter.

b) Korbbildungen. Bei Auftreten einer Korbbildung muß ein Drahtseil abgelegt werden.

b) Basket formations. If a basket formation occurs, a wire rope must be discarded.



c) Schlaufenbildungen. Bei erheblicher Veränderung des Seilverbandes durch Schlaufenbildungen von Drähten muß ein Drahtseil abgelegt werden.

c) Loop formations. In the event of a significant change in the rope assembly as a result of loop formations of wires, a wire rope must be discarded.

4.6.6 Überprüfung auf Strukturveränderungen / Checking for structural changes

Im Hauptarbeitsbereich laufender Drahtseile, d. h. in den Seilzonen, die die größte Zahl von Biegewechseln ausführen, erwartet man im Normalfall die ersten Seilschäden. Seilverformungen wie Korkenzieher, Korbbildungen oder Schlaufenbildungen finden sich aber sehr häufig außerhalb des Hauptarbeitsbereiches der Seile, da die Seilrollen die verursachenden Litzen- oder Drahtüberlängen aus dem Überrollungsbereich herausmassieren. Auch vor der Seiltrommel oder aber vor den Endbefestigungen können sich derartige Seilschäden ausbilden. Diese Bereiche sind daher mit der gleichen Sorgfalt zu untersuchen.

The first rope damage can usually be expected to occur in the main operating range of wire ropes, i.e. in the rope zones performing the largest number of alternate bends. However, rope deformations such as corkscrews, basket formations or loop formations frequently occur outside the main operating range of the ropes, because excess strand or rope lengths are "massaged" out of the roll-over section by the pulleys. Such rope damage may also occur in front of the rope drum or end fastenings. Hence these areas should be inspected with the same care.

Während der Untersuchung sind die Seile auch einmal zu bewegen, um auch momentan nicht zugängliche Seilzonen begutachten zu können.

During the inspection the ropes should also be moved to enable evaluation of any rope zones that are temporarily inaccessible.

Schleifspuren an Konstruktionsteilen können wertvolle Hinweise auf einen nicht einwandfreien Seiltrieb und mögliche Seilschäden sein.

Abrasion marks on structural parts may be useful indications of an unsatisfactory rope drive and possible rope damage.

Störungen des Seilverbandes sind die am schwierigsten zu beurteilenden Ablegekriterien. Wenn auch nur die geringsten Zweifel an der Betriebssicherheit des Drahtseiles vorliegen, sollte das Seil abgelegt werden.

Faults in the rope assembly are the most difficult discard criteria to evaluate. The rope should be discarded even if only the slightest doubt exists with regard to its reliability.

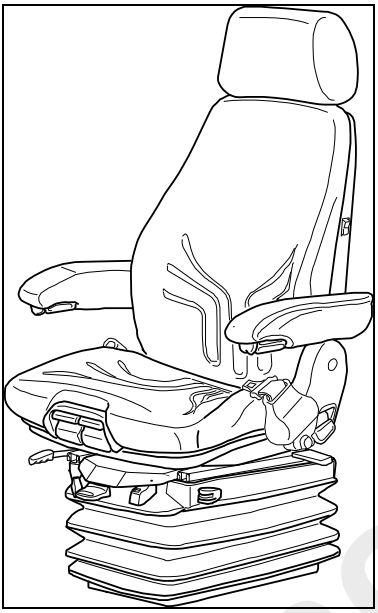
4.6.7 Überprüfung von Seilrollen und Seiltrommeln / Checking rope pulleys and rope drums

Neben dem Drahtseil selbst verdienen auch alle Teile der Anlage, mit denen das Seil in Berührung kommt, unsere Aufmerksamkeit. Die im folgenden für die Seilrollen gemachten Aussagen gelten in analoger Form auch für die Seiltrommeln.

In addition to the wire rope itself, all parts of the plant with which the rope comes into contact merit attention. The following comments on the rope pulleys also apply where appropriate to the rope drums.

Inhaltsverzeichnis

* falls vorhanden ** je nach Ausführung *** nachrüstbar



Schmutz kann die Funktion des Fahrersitzes beeinträchtigen.
Halten Sie deshalb Ihren Fahrersitz sauber!

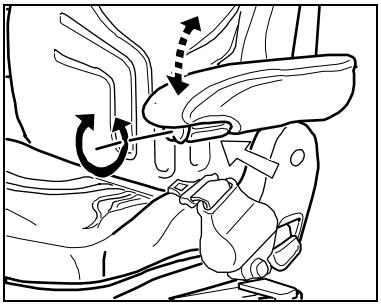
Polster müssen zur Pflege nicht vom Sitzgestell gelöst und abgenommen werden.

Vorsicht Verletzungsgefahr durch Vorschnellen der Rückenlehne!
Beim Reinigen des Rückenlehnenpolsters muss bei Betätigung der Rückenlehneneinstellung die Rückenlehne mit der Hand abgestützt werden.

ACHTUNG: Fahrersitz nicht mit Hochdruckreiniger reinigen!

Bei der Reinigung der Polsterflächen muss ein Durchfeuchten der Polster vermieden werden..

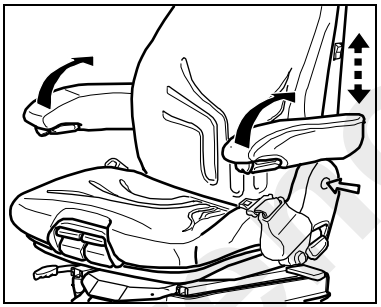
Handelsübliche **Polster-** oder **Kunststoffreiniger** erst an verdeckter, kleinerer Fläche auf **Verträglichkeit prüfen**.



Armrest adjustment *

The inclination of the armrests can be modified by turning the adjustment knob.

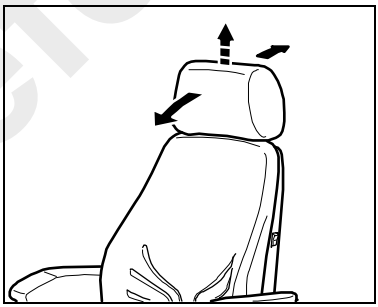
When turning the knob to the outside the front part of the armrest will be lifted, when turning the knob to inside it will be lowered.



Armrests * ***

The armrests can be folded up if required and the height individually adjusted.

To adjust the armrests for height, separate the round cap (see arrow) from the cover, loosen the hexagon nut (size 13 mm) behind it and adjust the armrests to the desired position (5-steps) and tighten the nut again (**25Nm**). Replace the cap onto the nut.



Headrest * ***

The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.

By pushing foreward or rearward the angle of the headrest can be adjusted individually.

To remove the headrest, pull it over the end stop.

* if fitted ** depending on model *** optional extra

- **Toute transformation apportée au modèle de série** (p. ex. pièces de rééquipement ou de rechange non originales au lieu de pièces d'origine de **GRAMMER** AG) peut causer l'annulation de l'état de conformité certifié du siège de conducteur. Ceci pourrait avoir pour conséquence **la restriction de certaines fonctions du siège de conducteur** qui pourraient mettre en danger **votre sécurité**. Pour cette raison, **toute transformation** du siège doit impérativement être homologuée par **GRAMMER** AG.
- Lors du montage et du démontage d'un siège de conducteur, il faut impérativement tenir compte des instructions du constructeur automobile.
- Ne soulevez pas le siège en le prenant par les couvercles. Sinon, il y a **grand risque d'accident car les couvercles pourraient se détacher ou se briser**.
- Avant le démontage du siège de conducteur, il faut déconnecter tous les raccordements par fiche entre le siège et le réseau d'alimentation de bord. Lorsque vous reconnectez le siège, il faut s'assurer de l'étanchéité (poussière, eau) des raccordements.
- Le siège est équipé de ceintures de sécurité ou peut être équipé ultérieurement de celles-ci. **L'équipement ultérieur** en ceintures n'est autorisé que si **le constructeur automobile a donné son accord préalable,** car la fixation du siège doit alors supporter une charge plus élevée.
  Cet équipement ultérieur devra être effectué conformément aux dispositions et aux directives du pays d'utilisation correspondant et être approuvé par **GRAMMER** AG.
- Les ceintures de sécurité doivent impérativement être mises **avant la mise en marche du véhicule**.
  Il est impératif de changer les ceintures de sécurité après chaque accident.
  Si un siège est équipé de ceintures de sécurité, **le siège** et **sa fixation** doivent également, après un accident, être soumis à un contrôle par du personnel qualifié.
- Il faut s'assurer régulièrement que les assemblages par vis sont **bien serrés**. Si le siège bouge, cela peut indiquer que des vis sont débloquées ou qu'il y a un défaut.
- Si vous constatez des irrégularités dans le fonctionnement (p. ex. une suspension défectueuse du siège de conducteur, une déformation du support lombaire, etc.) ou des endommagements du siège de conducteur (p. ex. un soufflet endommagé, etc.), **consultez immédiatement un atelier spécialisé** pour en chercher la cause.
  Le non-respect de cette règle constitue un danger pour votre santé et **augmente le risque d'accident**.
- Avant la mise en service du véhicule, vérifiez le **bon fonctionnement** des interrupteurs intégrés à l'assise du siège conducteur (permettant d'arrêter des appareils quand vous quittez le siège ou le véhicule).
  En cas de dysfonctionnements, le véhicule ne doit pas être mis en service.
  – **GRAND RISQUE D'ACCIDENT** –
- **Ne déposez pas d'objets sur l'assise d'un siège** avec interrupteur intégré (par ex. pour la détection d'occupation), sinon le véhicule pourrait se mettre en marche sans chauffeur en dehors d'une utilisation normale.
  – **GRAND RISQUE D'ACCIDENT** –
  Descendre du siège pendant que le véhicule roule provoque son arrêt.
- Pendant la circulation - siège occupé - ne pressez pas le soufflet vers l'intérieur.
  – **RISQUE D'ECRASEMENT** –

MoTec

MD3072B
Art.-no. 401 0040 000

MD3072B-Quad
Art.-no. 401 0041 000

Betriebsanleitung Allgemein
General Operating Manual
Radio Remote Control

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7.1 MFS Übertragungstechnologie (Multi Frequency Sharing)

Bei den Ausführungen Pocket, Hand Held und Ergo wird das MFSHL System verwendet. MFS-Technologie ermöglicht es, dass mehrere Systeme mit derselben Frequenz im selben Umfeld bedient werden können.

Sender: ERGO-MFS-HL Pocket-MFS-HL HandHeld-MFS-HL



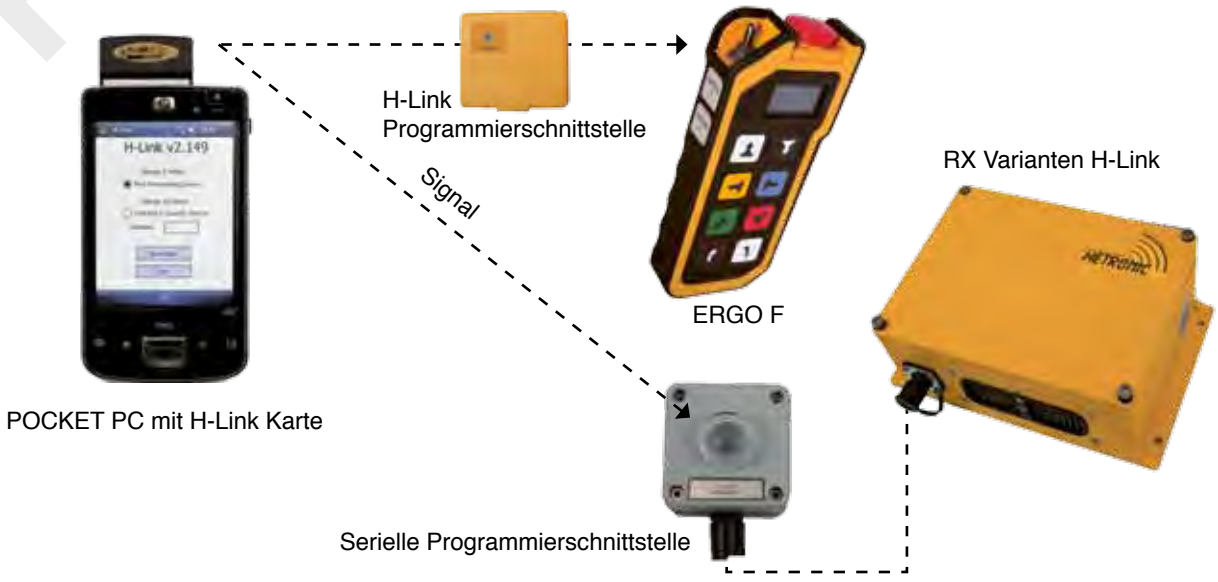
Empfänger: RX/AC 8 und 16 MFS-HL RX/DC 8 und 16 MFS-HL


Sender	Rote LED	Grüne LED
Unterspannung	An	Blinkend
Sender Fehler	An	An
Sender Normal	Aus	Blinkend
Nothalt Sender	Blinkend	Aus

Empfänger	Rote LED	Grüne LED	Buzzer
Fehler Hauptkontakt	An	Aus	Aus
Empfänger aktiv	Aus	Aus	Pfeift
empfängt	Aus	Blinkend	Aus

7.2 H-Link

H-Link ist eine Technologie, die dem Bediener den Zugriff auf die Konfiguration von HETRONIC Funkfernsteuerungen ermöglicht, ohne dass diese geöffnet werden müssen! Die Verdrahtung und Belegung wird durch drahtlosen Datenaustausch zwischen HETRONIC Geräten und einem H-Link Konfigurator ersetzt.
Mittels H-Link können Funktionen wie z. B. Systemadressen, Senderfrequenzkanäle, automatische Abschaltung, Verriegelung, Ausgangseinstellung und vieles mehr eingestellt werden. In der Anleitung ERGO F finden Sie hierzu weitere Informationen. Nach der Erstprogrammierung durch HETRONIC kann beim Sendertyp ERGO F der Frequenzkanal ohne die Verwendung von H-Link eingestellt werden.



Problem	Possible Cause	Solution
The transmitter does not respond when it is switched on.	The battery is empty.	Charge the batteries or replace the alcaline batteries.
	The fuse is blown.	The fuse has to be replaced by an authorized expert.
	The key switch is broken.	The key switch has to be replaced by an authorized expert.
The batteries are fully charged but the transmitter does not respond.	The battery contacts are soiled.	Please clean the battery contacts using a cloth.
	The spring contacts of the battery compartment are broken.	The spring contacts have to be replaced by an authorized expert.
Communication failure between transmitter and receiver.	The range has been exceeded.	Move towards the receiver.
	A radio remote control with the same frequency is operated in close proximity.	The RF settings have to be adjusted by an authorized expert.
	There is an object between transmitter and receiver.	Please change the position of the transmitter or modify the antenna position by using an antenna extension.
The operation time is short.	The battery is empty.	Charge the battery and insert a fully charged battery into the transmitter.

Do you have any questions?
Please contact your dealer or our HETRONIC service team. We are pleased to help you.
Tel. 09452/189-0

HF-Teil Konformität Europa
HF-Part Conformity Europe

Maßnahmen zur effizienten Nutzung des Funkfrequenzspektrums *Measures for the efficient use of the radio frequency spectrum*	
☑ Luftschnittstelle bei Funkanlagen gemäß § 3(2) (Artikel 3(2» *Air interface of the radio systems pursuant to § 3(2) (Article 3(2»*	
Angewendete harmonisierte Normen *Harmonised standards applied*	**EN 300 220-1 V2.1.1 (2006-04)** **EN 300 220-2 V2.1.2 (2007-06)**
Einhaltung der grundlegenden Anforderungen auf andere Art und Weise (hierzu verwendete Standards/Schnittstellenbeschreibungen) *Other means of proving conformity with the essential requirements (standards/interface specifications used)*	

Anschrift / Address	**HETRONIC-Germany GmbH** **Adalbert-Stifter-Str. 2** **84085 Langquaid** **Deutschland**
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Langquaid, 01.08.10

Ort, Datum
Place, date of issue

Name und Unterschrift
Signature

Adalbert-Stifter-Straße 2, D-84085 Langquaid, Germany
As of May 2010

HETRONIC Germany GmbH (henceforth referred to as HETRONIC) as constructor allows a guarantee to the contractual item under the following conditions. The guarantee is valid from the day of delivery to the customer. The duration of the guarantee is determined by the amount of time stated in the confirmation of order.

The guarantee is only valid to the buyer mentioned in the confirmation of order. To make use of the guarantee, the buyer has to clearly prove to HETRONIC any defects immediately , but latest within 14 days after discovery of the defects or after the point of time at which the defect was noticeable to the buyer without any closer inspection, considering normaly usage. Along with the fault notice, the buyer has to deliver any proofs (photographs, drawings, fault descriptions etc.).

In case of a guarantee condition HETRONIC has the right to reimprove the same item three times because of the same fault. Only should the manufacturer fail to reimprove the item does the buyer have a right to demand a replacement delivery of an identical item. In case of a replacement delivery the manufacturer has the right to deliver the buyer a replacement part of equal kind and value.

Exempt from the guarantee are wear and tear parts. Should the buyer in any way alter or change a delivered item without the explicit agreement of the manufacturer, any claim to the guarantee expires. Should the buyer build any foreign parts into the delivered items that are not original HETRONIC replacement parts, any claims to the guarantee also expire. This is especially the case when accumulators are used that are also not original HETRONIC products.

The claim to the guarantee expires as well if the buyer treats the delivered items improperly, in case of natural wear and tear, in case of nonregard of usage, construction and maintenance instructions and in case of the use of improper and inappropriate equipment along with the delivered items. The costs and the guarantee are only covered by HETRONIC in case of later improvement and replacement delivery as stated above. Any further costs (transportation, packaging, etc.) are covered by the buyer. HETRONIC is not responsible for any further costs after the acquisition of the products by the buyer. Location of guarantee delivery is Langquaid.

These guarantee conditions are a mere transalution of the german version. Should arise any differences between the two versions, the german version is valid.

German law is valid. Place of jurisdication is Regensburg.

1. Residual length of useful life of winches

1.1 Steps required to ensure safe periods of operation

1.1.1 General

Under the German accident prevention regulations covering winches, lifting and pulling equipment (VBG 8), the owner of the crane is obliged to perform a crane inspection at least once a year (see also ISO 9927-1).

Among other checks, the inspection requires the **spent share of the theoretical length of useful life of the winches** to be determined. Where necessary, the owner of the crane must commission an expert person to do this.

ATTENTION: This is a legally binding requirement within the scope of application of the accident prevention regulations of the German statutory accident insurance. Outside the scope of application, the crane manufacturer recommends to also follow the procedure specified below.

2.1 Periodic inspection of cranes

2.2 Steps required to monitor the winches

2.2.1 Theoretical length of useful life

When calculating and dimensioning the winches of your crane, the design engineers have assumed particular operating conditions and a theoretical total running time, from which results a theoretical length of useful life.

In accordance with DIN-Fachbericht 1, ISO 4301/1, or FEM 9.511, respectively, the winches of your crane have been classified as follows:

Driving gear group:	M.....
Duty cycle:	Q..... (L.....)
Factor of duty cycle:	k_m = ...

From this results a **theoretical length of useful life D.**

Note: For the data applicable in the individual case refer to the table „Monitoring of the Winches“ in the crane inspection and test log book.

ATTENTION: The „theoretical length of useful life“ must not be treated as equivalent to the real (effective) length of useful life of a winch!
In case the crane is used in a manner which differs from that provided for, the owner has to perform the calculations himself!

The effective length of useful life of a winch is subject in addition to a great number of external influences, such as:

1. Instances of overloading due to misuse of the crane
2. Inadequate maintenance: Failure to perform oil change in due time
3. Incorrect operation: Extreme acceleration or deceleration of the load
   Load is allowed to drop into the ropes
4. Improper maintenance: Use of the wrong oil
   Incorrect filling level
   Contamination during oil change

Additional documentation

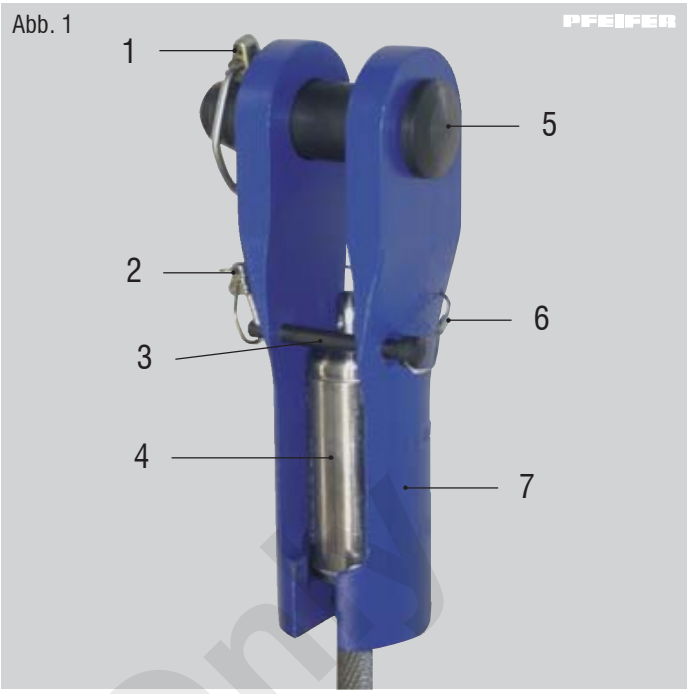
Installing large roller bearings, slewing gears and flange connections

4. Allgemeine Hinweise

Die **Taschenschlösser Typ 22A** des PFEIFER Taschenschloss-Systems bestehen aus den Bauteilen (siehe Abb. 1): Gehäuse, Bundbolzen mit Sicherheitsklappstecker A und Sicherungsbolzen mit Seil und Sicherheitsklappstecker B.

1 Sicherheitsklappstecker A
2 Sicherheitsklappstecker B
3 Sicherungsbolzen
4 Schlossklemme bzw. Schlossvergusshülse mit Seil
5 Bundbolzen
6 Sicherungsseil
7 Gehäuse

Abb. 1



Als **Seilendverbindung** dienen die PFEIFER Schlossklemmen Typ 11A (Abb. 2) und 12A (Abb. 3) sowie die PFEIFER Schlossvergusshülsen Typ 13A und 14A.

Abb. 2

PFEIFER Schlossklemme Typ 11A

PFEIFER Schlossvergusshülse Typ 13A

Geprüft nach den Vorgaben der EN13411

Anwendungsgebiet: Äußerst drehungsarme Rundlitzenseile

Merkmal: Ohne Drehsicherung am Seilaustritt

Abb. 3

PFEIFER Schlossklemme drehgesichert Typ 12A

PFEIFER Schlossvergusshülse drehgesichert Typ 14A

Geprüft nach den Vorgaben der EN13411

Anwendungsgebiet: Nicht drehungsfreie und drehungsarme Rundlitzenseile

Merkmale: Drehsicherung (Nase) am Seilaustritt

Abb. 4

Einziehöse zur Befestigung eines Hilfseinscherseiles an der Seilendverbindung.

Abb. 5

Drehsicherung (Nase) am Seilaustritt des Seilendbeschlages zur Sicherung der nicht drehungsfreien Rundlitzenseile gegen Aufdrehen.

ACHTUNG

Maximal zulässige Zugkraft der Einziehöse beachten.

ACHTUNG

Ein Aufdrehen der Seile führt zum Seilversagen und dem Lösen der Last.

6. Important Security Informations

WARNING

Accidental releasing of the load or releasing the load as a result of failure of the PFEIFER Pouch Socket System, poses direct or indirect danger to the health and safety of persons within the danger zone.

WARNING

Non rotation resistant ropes and rotation resistant ropes must not be used with a rotating fixed-point (e.g. swivel, hydraulic cylinder etc.). Noncompliance will result in considerable rope damage, rope break and releasing of the load.

By using a swaged steel sleeve for rope end termination (Type 11A and 12A) the minimum breaking load of the rope will be reduced to 90 %.

Never use in conditions below –40 °C or exceeding +80 °C

While working with the PFEIFER Pouch Socket System special protective measures must be taken. Wear a helmet.

While working with the PFEIFER Pouch Socket System special protective measures must be taken. Wear safety shoes.

While working with the PFEIFER Pouch Socket System special protective measures must be taken. Wear protective gloves.

7. Operation

CAUTION

Falling loads, shock loads or to exceed the working load limit are forbidden and will result in the exclusion of warranty and product liability.

CAUTION

The PFEIFER Pouch Socket System has to be checked for damages. Damaged parts and components have to be replaced and may not be used.

During the operation pay attention to the correct fit of the bolt, the safety pin, the safety clip pins, and the end terminations (swaged sleeve and resin socket) in the pouch socket.

During the operation avoid side-loading of the pouch socket and oblique pull.

2.1.1.2 Emissions levels Tier 4 Interim and Tier 4 Final

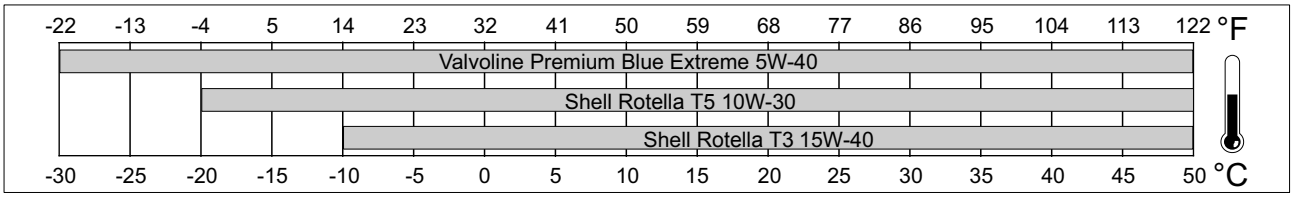


Fig. 5: Temperature ranges

Recommendation	ID no.	Specification	Alternative
Valvoline Premium Blue Extreme 5W-40	SE: 157283	API CJ-4; Cummins CES20081	Shell Rotella T6 5W-40; Motorex Nexus FE 5W-30
Shell Rotella T5 10W-30	SE: 179999 Shell: 001D5436	API CJ-4; Cummins CES20081	Eni i-Sigma top MS 10W-30; Castrol Enduron Global 10W-40 9999300231 Shell Rotella T5 SB 10W-40
Shell Rotella T3 15W-40	SE: 187162 Shell: 001D5433	API CJ-4; Cummins CES20081	9999300255 9999300256 9999300257Conoco Fleet Supreme EC Engine Oil 15W-40

2.2 Coolant

Engine	Recommendation	ID no.	Specification	Mixing ratio
Cummins	Cummins ES Compleat	SE: 181966	Cummins CES 14603	As specified in the operating manual [1] 9999300302 OWI Finalcharge Global Extended Life AFC 50/50 prediluted; (Standard AFC option 9999300201 9999300202 9999300203 9999300204 OWI Fleetcharge 50/50 fully formulated precharged antifreeze/coolant)

[1] Year-round mixing ratio at least 50% coolant concentrate to 50% fresh water for frost protection to -37 °C (-34 °F). Maximum 60% coolant concentrate to 40% fresh water for frost protection to -52 °C (-61 °F).

2.3 Fuel

Emissions level	Fuel specification	Sulfur content
Tier 2 and Tier 3	Diesel fuel DIN EN 590; ASTM D975 LSD 1D, 2D	≤ 500 mg/kg
Tier 4 final	Diesel fuel DIN EN 590, ASTM D975 ULSD 1D, 2D	≤ 15 mg/kg

Observe the instructions concerning fuel in the operating manuals of the diesel engine manufacturers.

OPERATOR MANUAL

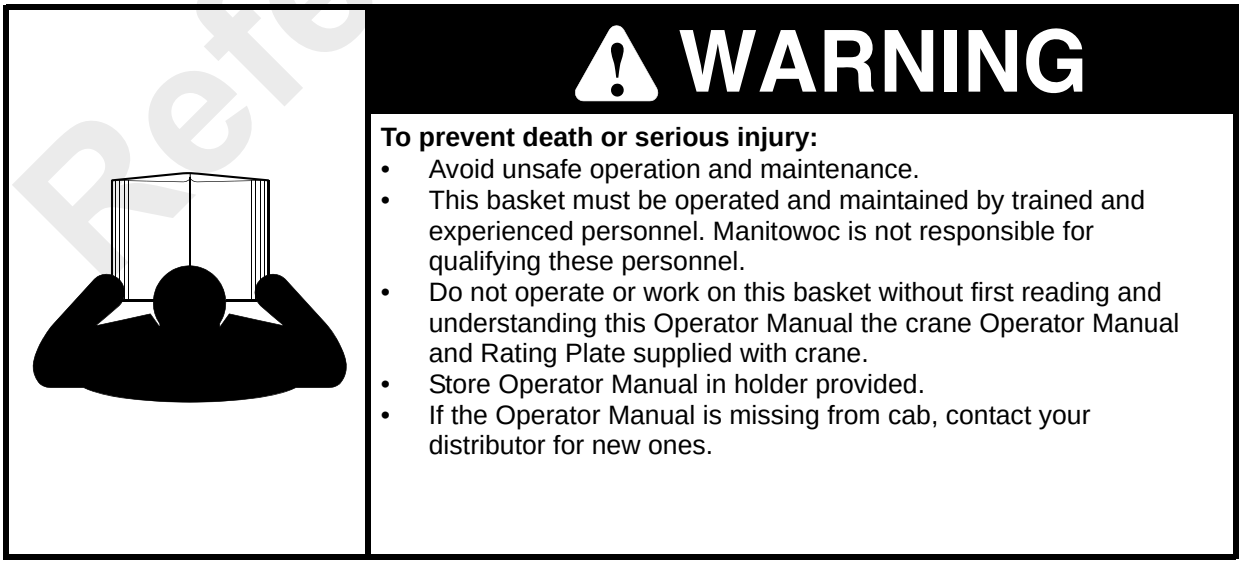
This manual has been prepared for and is considered part of the

Personnel Basket Option

NOTICE

The basket serial number is the only method your distributor or the factory has of providing you with correct parts and service information.

Always furnish crane serial number when ordering parts or communicating service problems with your distributor or the factory.



⚠ WARNING

To prevent death or serious injury:

- Avoid unsafe operation and maintenance.
- This basket must be operated and maintained by trained and experienced personnel. Manitowoc is not responsible for qualifying these personnel.
- Do not operate or work on this basket without first reading and understanding this Operator Manual the crane Operator Manual and Rating Plate supplied with crane.
- Store Operator Manual in holder provided.
- If the Operator Manual is missing from cab, contact your distributor for new ones.

Published 8-01-2015, Control # 557-00

PERSONNEL LIFT PLATFORM PRE-LIFT INSPECTING		
Inspector Date	Platform ID	
	Satisfactory	**Unsatisfactory**
1. Markings		
Platform decals and placecards (all information legible)		
Suspension system decals and placards		
2. Structure		
Load supporting welds/bolts		
Load supporting members		
Barrier from toe board to intermediate rail		
Hand Rail		
Fall protection device anchor points		
Gate locking mechanisms		
Platform flooring		
Suspension attachment points		
3. Attachment mechanisms		
Pins/Ears/Bolt-ups/Eyes (circle)		
Basket mounting bracket		
Basket pivot bearings		
4. Special purpose items		
Hand brake operation		
Safety harness and lanyards		
Floor cleanliness		
5. General comments:		

Name *Signature* *Date*