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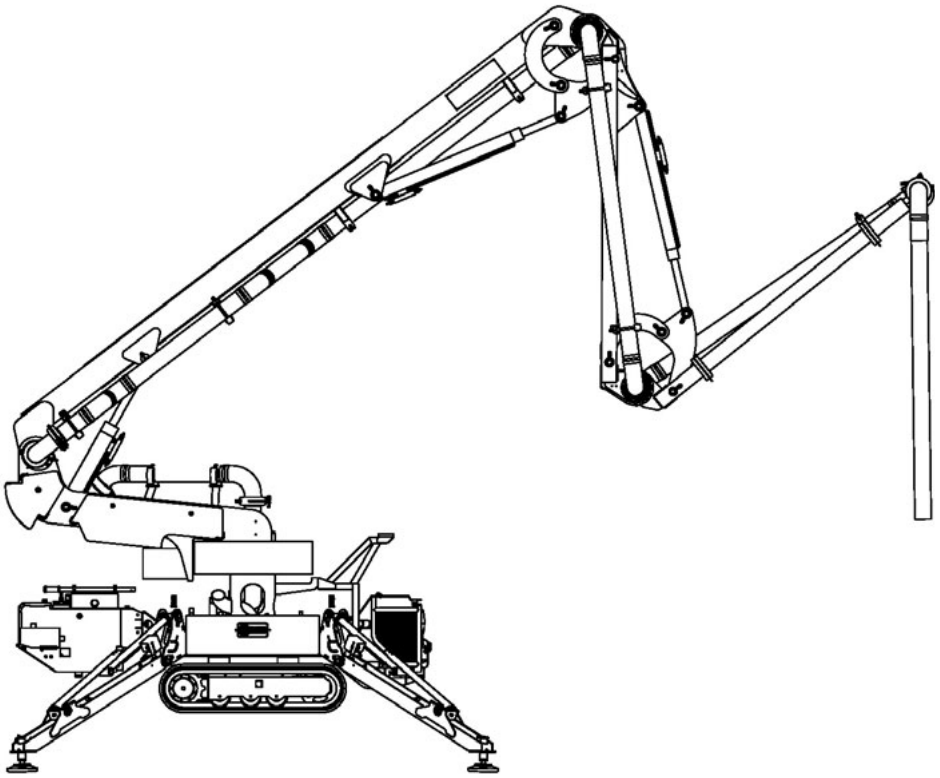
BRACCIO DI DISTRIBUZIONE CALCESTRUZZO CINGOLATO SEMOVENTE - MANUALE USO E MANUTENZIONE

MUM GERRIS 800 IT R01 05/2023

GERRIS 800



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IMER International S.p.A.

Sede legale e amministrativa
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

Sede operativa
Equipment division
Via della Meccanica, 39 (Zona Industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

imergroup.com

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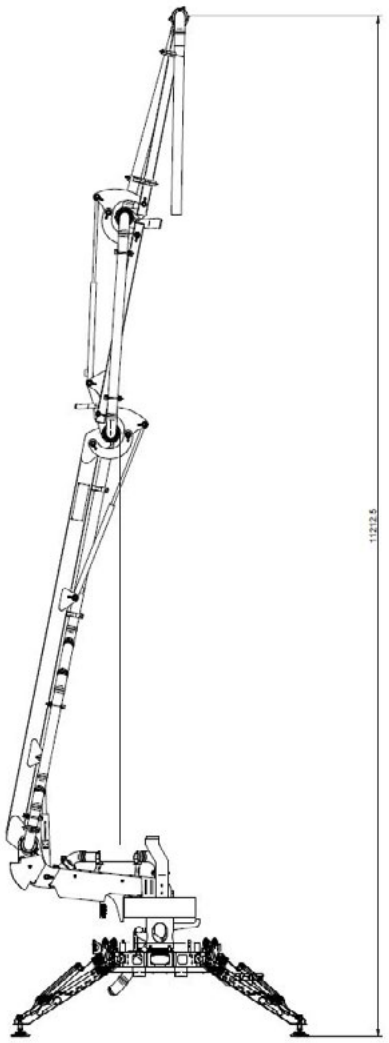
1. PRESENTAZIONE

Il presente volume contiene il manuale di uso e manutenzione del braccio di distribuzione calcestruzzo semovente cingolato:

GERRIS 800



Progettato e realizzato con:

- motorizzazione benzina;
- funzionamento idraulico e comandi proporzionali;
- controllo a distanza mediante radiocomando.

GERRIS 800 raggiunge l'altezza di 11,20 m e può essere utilizzato in ambiente esterno ed interno.

L'uso di questa macchina è consentito solo a personale addestrato e autorizzato.

Lo scopo del manuale uso e manutenzione è fornire le istruzioni necessarie per un uso corretto e sicuro della macchina per evitare gravi danni a sé e agli altri.

Tutte le informazioni presenti in questo manuale sono inderogabili: devono essere lette attentamente e capite prima di iniziare ad utillizzare la macchina.

Il manuale uso e manutenzione è un importante strumento di lavoro e deve essere conservato nell'apposito vano per essere disponibile in qualsiasi momento.

Tutti i testi evidenziati dalla cornice forniscono avvisi di sicurezza e vanno letti con particolare attenzione.

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Prove statiche e dinamiche

Prima della messa in servizio sono state eseguite le prove statiche e dinamiche affini alla norma armonizzata EN 280 al punto 6.3.

Servizio assistenza

Per interventi, riparazioni e revisioni, rivolgersi ad officine autorizzate. Per informazioni rivolgersi al Servizio Assistenza Tecnica.

Servizio ricambi

Una garanzia di buon funzionamento e di durata è consentita solo utilizzando parti di ricambio originali; a tale scopo consultare il “CATALOGO RICAMBI”.

Nelle richieste di parti di ricambio nonché nella richiesta d’interventi citare sempre i dati riportati nella targa d’identificazione posta sul telaio.

Responsabilità

La IMER International S.p.A. resterà esonerata da ogni responsabilità ed obbligazione per qualsiasi danno causato alle persone o alle cose dovuto ad una delle ragioni di seguito elencate:

- mancata osservanza delle istruzioni indicate nel presente MANUALE USO E MANUTENZIONE per quanto riguarda la conduzione, l’impiego e la manutenzione della macchina;
- manovre errate nell’impiego e la manutenzione della macchina;
- modifiche apportate alla struttura o ai componenti della macchina senza previa autorizzazione della IMER International S.p.A. e/o senza l’utilizzo di attrezzature adeguate;
- avvenimenti estranei al normale e corretto uso della macchina descritto in questo MANUALE USO E MANUTENZIONE;
- uso di parti di ricambio non originali non autorizzate dal costruttore.

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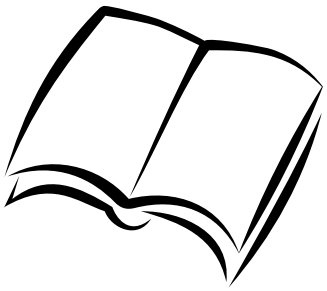
Raccomandazioni generali - sicurezza

Manuale



Una adeguata sicurezza nel lavoro é indispensabile per evitare gravi danni a sé stessi ed agli altri, pertanto è obbligatorio leggere e capire il presente manuale che fornisce istruzioni basilari e precise per l'uso della macchina e per le operazioni di manutenzione.

Questo manuale è da considerarsi come parte della macchina, deve sempre rimanere a bordo e conservato per successive consultazioni.

Il manuale d'uso deve essere conservato a cura dell'utente per tutto il tempo di vita della macchina, anche in caso di prestito, noleggio o rivendita.

Le immagini riportate nel presente manuale NON sempre riproducono esattamente il modello descritto, ma sono utilizzate per una maggiore e più facile comprensione del testo.

Sistemi di sicurezza

I sistemi di sicurezza applicati alla macchina sono inevitabilmente soggetti ad usura e staratura: è indispensabile mantenerli controllati ed in stato di efficienza. Non è corretto affidarsi ciecamente al loro funzionamento nella valutazione delle condizioni operative e di sicurezza.

La loro presenza non può sollevare l'operatore dalla responsabilità di un utilizzo consapevole ed adeguato della macchina.

È assolutamente proibito asportare, modificare o manomettere organi del braccio distributore semovente importanti ai fini della sicurezza e della stabilità.

Qualsiasi manomissione degli organi principali e dei dispositivi di sicurezza del braccio distributore semovente porterebbe ad un immediato decadimento delle condizioni di garanzia.

In caso venisse rilevato un difetto che ha rilevanza per la sicurezza, tale difetto deve essere registrato sul libretto delle ispezioni e deve essere notificato per iscritto al produttore.

Etichette e targhe

Potenziali pericoli e prescrizioni riguardanti la macchina sono segnalati da etichette e targhe; è pertanto necessario accertarsi che siano leggibili e in buone condizioni.

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Requisiti operatore

L'uso di questa macchina è consentito solo a personale addestrato e autorizzato.

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L'operatore dovrà:

1. aver letto e capito tutta la documentazione allegata alla macchina, essere istruito ad un uso corretto della macchina ed essere a conoscenza dei dispositivi e delle norme di sicurezza;
2. essere fisicamente idoneo, non fare uso di droghe, alcool o farmaci che possano influenzare l'attenzione, la reazione, la vista, l'udito;
3. dare sempre importanza prioritaria alla sicurezza e rifiutarsi di operare quando si ritiene di non poter lavorare in modo sicuro;
4. utilizzare attrezzature antinfortunistiche adeguate alle condizioni di lavoro ed alla normativa locale in vigore;
5. in caso di esecuzione di lavori in posizione elevata, adottare idonee protezioni anticaduta;
6. ricorrere sempre ad un assistente opportunamente addestrato in aree dove la visione è ostruita;
7. lavorare sempre in condizioni di massima sicurezza, ordine e pulizia;
8. prima di utilizzare la macchina, fare un controllo giornaliero dei comandi e dei dispositivi di sicurezza ed accertarsi della loro efficacia ed efficienza;
9. verificare che l'area di lavoro sia libera da persone, animali ed ostacoli prima di effettuare qualsiasi movimento della macchina;
10. controllare che sul percorso della macchina non ci siano buche, cunette, dislivelli, ostruzioni, detriti e coperture che possano nascondere buche o altri pericoli;
11. estrarre sempre la chiave a fine lavoro e quando la macchina resta incustodita, al fine di evitare che persone non autorizzate possano in qualche modo utilizzarla;
12. estrarre la chiave a fine lavori o durante le pause, al fine di evitare un uso non autorizzato o non intenzionale. Una chiave di riserva deve essere conservata dal responsabile della sicurezza per consentire di utilizzare il posto di comando a terra come emergenza (in caso di guasto è possibile la discesa d'emergenza).

In particolare

- Essere al corrente che le macchine cingolate con comando remoto possono essere utilizzate solo da personale qualificato.
- Non cedere la pulsantiera a persone che non abbiano ricevuto una adeguata formazione.
- Acquisire dimestichezza con i simboli e le posizioni delle leve per l'esercizio delle funzioni e la movimentazione.

- Controllare sempre, prima di iniziare il lavoro, la funzionalità del pulsante per l'arresto d'emergenza della pulsantiera.
- Durante gli spostamenti della macchina, utilizzando la pulsantiera da terra restare a una distanza appropriata dalla macchina. Le persone non autorizzate non devono sostare all'interno dell'area di lavoro della macchina.
- Rilasciare tutte le leve se il movimento della macchina diventa incontrollabile e premere immediatamente il pulsante di arresto d'emergenza della pulsantiera.
- Premere sempre il pulsante d'emergenza della pulsantiera quando l'unità non è in uso. Ciò vale anche per brevi interruzioni.
- Premere sempre il pulsante d'emergenza della pulsantiera al termine del lavoro. La pulsantiera deve essere tenuta fuori dalla portata di persone non autorizzate.
- Riparazioni, lavori di manutenzione etc. devono essere effettuati con il braccio fermo ed appoggiato su di un sostegno adeguato; se necessario, stabilizzare e livellare la macchina per mezzo degli appositi stabilizzatori idraulici.

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Distanza dalle linee elettriche

La macchina non è elettricamente isolata e non offre nessuna protezione contro il contatto con parti attive di linee elettriche e di impianti elettrici non protette o non sufficientemente protette.

Di seguito è riportata una tabella delle distanze di sicurezza da rispettare obbligatoriamente in base alla legge italiana.

In altri stati possono esservi leggi con diverse limitazioni a cui l'operatore è obbligato ad attenersi.

Un (kV)	**Distanza minima consentita** (m)
≤ 1	3
10	3,5
15	3,5
132	5
220	7
380	7

Un = tensione nominale

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Operazioni non consentite

È severamente vietato usare la macchina:

- circolando sulle strade pubbliche;
- nel caso in cui l'illuminazione ambiente non garantisca una visibilità sufficiente allo svolgimento del lavoro o allo spostamento in condizioni di sicurezza;
- in caso di forti temporali, con o senza pioggia, o con vento di velocità superiore a 12,5 m/s, sesto grado della scala Beaufort riportata di seguito;
- in movimento con i cofani aperti;
- se l'area di lavoro non è sgombra da ostacoli che potrebbero causare condizioni di pericolo;
- entrando in contatto con oggetti fissi o mobili;
- in cattive condizioni di funzionamento;
- diversamente da quanto indicato nelle istruzioni d'uso;
- utilizzando il braccio distributore come gru elevatore o braccio meccanico per movimentare carichi;
- alterandone o rimuovendo i dispositivi di sicurezza;
- legandola a strutture adiacenti;
- in ambiente con areazione insufficente e atex;
- in presenza, nell'intera area di lavoro, di personale non autorizzato; nel caso, lo stesso deve essere fatto allontanare.

Inoltre è vietato:

- muovere la parte aerea quando la macchina si trova sul pianale di un camion o di altro veicolo;
- usare il braccio per scopi diversi da quello di scaricare e distribuire calcestruzzo, malta, sabbia, ghiaia o materiale simile con peso specifico non superiore a 2,4 kg/dm3;
- sostare o transitare nell'intera area di azione del braccio durante la sua movimentazione, utilizzo o manutenzione; mantenersi ad adeguata distanza di sicurezza;
- arrampicarsi sulla macchina per salire su di essa;
- saltare dalla macchina per scendere da essa;
- variare il diamentro delle tubazioni fissate alla struttura del braccio ed impiegate per la distribuzione del calcestruzzo;
- utilizzare tubazioni di diametro diverso da quelle in dotazione, determinando una variazione di carico sul braccio;
- applicare prolunghe alla tubazione per calcestruzzo del braccio;
- variare la lunghezza e le dimensioni del tubo teminale in gomma, applicarne prolunghe o altri dispositivi;
- piegare il tubo teminale in gomma o immergerlo nel calcestruzzo durante le operazioni di pompaggio.

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Scala Beaufort del vento

	Descrizione vento	Velocità del vento (km/h)	Velocità del vento (m/s)	Condizioni del mare	Condizioni a terra
0	Calmo	0	0	Mare calmo (olio)	Il fumo sale verticalmente
1	Bava di vento	1-6	0.3-1.5	Leggere increspature sulla superficie somiglianti a squame di pesce. Ancora non si formano creste bianche di schiuma.	Movimento del vento visibile dal fumo.
2	Brezza leggera	7-11	1.6-3.4	Onde minute, ancora molto corte ma ben evidenziate. Le creste non si rompono ancora, ma hanno aspetto vitreo	Si sente il vento sulla pelle nuda. Le foglie frusciano
3	Brezza tesa	12-19	3.4-5.4	Onde con creste che cominciano a rompersi con schiuma di aspetto vitreo. Si notano alcune “pecorelle” con la cresta bianca di schiuma.	Foglie e rami più piccoli in movimento costante
4	Vento moderato	20-29	5.5-7.9	Onde con tendenza ad allungarsi. Le “pecorelle” sono più frequenti	Sollevamento di polvere e carta. I rami sono agitati
5	Vento teso	30-39	8.0-10.7	Onde moderate dalla forma che si allunga. Le pecorelle sono abbondanti e c’è possibilità di spruzzi.	Oscillano gli arbusti con foglie. Si formano piccole onde nelle acque interne.
6	Vento fresco	40-50	10.8-13.8	Onde grosse (cavalloni) dalle creste imbiancate di schiuma. Gli spruzzi sono probabili	Movimento di grossi rami. Difficoltà ad usare l’ombrello.
7	Vento forte	51-62	13.9-17.1	I cavalloni si ingrossano. La schiuma formata dal rompersi delle onde viene “soffiata” in strisce nella direzione del vento.	Interi alberi agitati. Difficoltà a camminare contro vento
8	Burrasca	63-75	17.2-20.7	Onde alte. Le creste si rompono e formano spruzzi vorticosi che vengono risucchiati dal vento	Ramoscelli strappati dagli alberi. Generalmente è impossibile camminare contro vento
9	Burrasca forte	76-87	20.8-24.4	Onde alte con le creste che iniziano ad arrotolarsi. Strisce di schiuma che si fanno più dense.	Leggeri danni alle strutture (camini e tegole asportati).
10	Tempesta	88-102	24.5-28.4	Onde molto alte sormontate da creste (marosi) molto lunghe. Le strisce di schiuma tendono a compattarsi e il mare ha un aspetto biancastro. I frangenti sono molto più intensi e la visibilità è ridotta.	(Rara in terraferma) Sradicamento di alberi. Considerevoli danni strutturali.
11	Tempesta violenta	103-117	28.5-32.6	Onde enormi che potrebbero anche nascondere alla vista navi di media stazza. Il mare è tutto coperto da banchi di schiuma. Il vento nebulizza la sommità delle creste e la visibilità è ridotta.	Gravi devastazioni Vasti danni strutturali
12	Uragano	> 117	> 32.5	Onde altissime; aria piena di schiuma e spruzzi, mare completamente bianco	Gravissime catastrofi Danni ingenti ed estesi alle strutture

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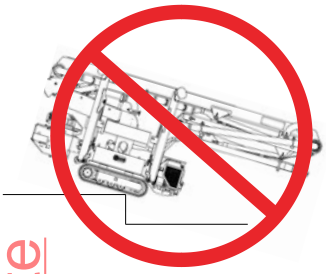
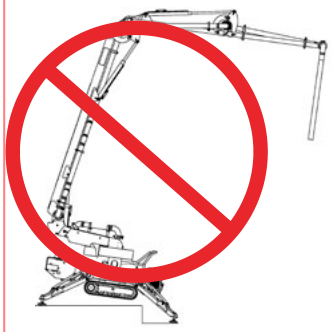
Per ridurre i rischi

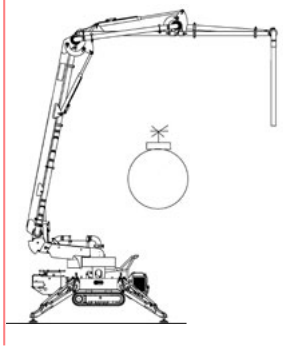
Rispettare le seguenti istruzioni



Rischi di ribaltamento

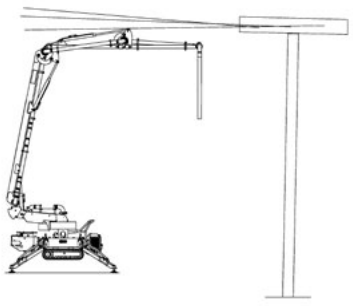
- Verificare che il suolo sia di accertata consistenza e solidità.
- Non utilizzare la macchina su terreno sdrucciolevole, ghiacciato, fangoso, sconnesso, in presenza di buche, che presenti una pendenza superiore al limite consentito.
- Mantenere una distanza di almeno 2 m da forti dislivelli (fossati, terreni scoscesi, ecc…).
- Controllare che sul percorso della macchina non ci siano buche, cunette, dislivelli, ostruzioni, detriti e coperture che possano nascondere buche o altri pericoli.
- Evitare gli urti contro ostacoli fissi o mobili.
- Non usare la macchina come gru, con materiali sospesi alle strutture di sollevamento.
- Durante tutti i movimenti controllare che non ci siano ostruzioni intorno, sopra o sotto la macchina.
- Eseguire gli spostamenti solo se la visibilità dell'area di lavoro è completa.
- Non applicare alla macchina elementi (es.pannelli) che aumentino l'esposizione del vento.





Rischi di esplosioni o di ustioni

- Non utilizzare la macchina in prossimità di fiamme libere o di fonti di calore.
- Ricaricare le batterie in ambienti ventilati, lontano da fonti di calore e liquidi esplosivi.
- Non utilizzare la macchina se presenta perdite d'olio.
- Non utilizzare la macchina in ambienti con atmosfera esplosiva.
- Spegnere il motore durante i rifornimenti di carburante.
- Rifornire di carburante in area ben ventilata.
- Asciugare il carburante eventualmente fuoriuscito.
- Non fumare durante il rifornimento.



Rischi elettrici

- Non essendo la macchina elettricamente isolata dovrà essere posta particolare attenzione da parte dell'utilizzatore nell'evitare ogni contatto con parti potenzialmente sotto tensione.
- Non possono essere eseguiti lavori in prossimità di linee elettriche a distanza minore di quella indicata nella tabella pag.14.

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Rischi legati all'utilizzo del braccio distributore

- Verificare periodicamente lo spessore delle tubazioni (vedere capitolo "Manutenzione").
- In caso di necessità di sostituzione, utilizzare parti di ricambio originali.
- La prestazione della pompa deve essere adeguata alle dimensioni delle tubazioni e dei giunti.
- I giunti non devono essere aperti durante le operazioni di pompaggio e, prima della loro apertura, deve essere tolta pressione dalla tubazione stessa aspirando il calcestruzzo.
- Chiudere saldamente i giunti dopo la posa in opera della tubazione.
- Perdite di boiacca denotano usura o deformazioni del complesso giunto-guarnizione-tubazione.
- È consigliabile ruotare settimanalmente le tubazioni sul proprio asse per uniformarne l'usura e aumentarne la durata (vedere capitolo "Manutenzione").
- Controllare giornalmente lo stato dei giunti a leva e sostituirli immediatamente con equivalenti se presentano deformazioni.
- Non aprire mai i giunti a leva con le tubazioni in pressione; effettuare prima la manovra di aspirazione per almeno 30 secondi.
- Anche dopo questa manovra, durante l'apertura dei giunti a leva allontanare sempre il volto e gli arti per evitare di essere colpiti da eventuali resti di calcestruzzo in pressione residua.
- I giunti a leva della tubazione del calcestruzzo devono essere chiusi e bloccati per mezzo dell'apposita spina.

Rischi legati all'intasamento del distributore

L'intasamento è la condizione per cui, a seguito della formazione di un'occlusione nella tubazione, il flusso di calcestruzzo tende a bloccarsi. Per superare la resistenza posta dall'ostacolo, la pressione del circuito oleodinamico sale al massimo valore creando, in questo modo, condizioni di estremo pericolo. In tale condizione, continuando a spingere, i tamponi potrebbero sbloccare l'occlusione; per reazione si ottiene un colpo di ariete che, scaricandosi sul tubo terminale in gomma, innesca un colpo di frusta potenzialmente mortale.

- **Ulteriore grave rischio, in caso di picchi di pressione in pompaggio per occlusione, è la possibile esplosione di tratti di tubazione particolarmente usurati** (vedere tabella riportante i valori minimi ammissibili, al capitolo "Manutenzione").
- È necessario che l'operatore avverta per tempo i sintomi dell'intasamento e, al primo innalzamento anomalo della pressione di pompaggio, fermi la pompa e la azioni in aspirazione.
- Il pompaggio deve poi riprendere a basso regime e con grande attenzione.
- Se l'intasamento è occasionale il pompaggio potrà riprendere quasi certamente grazie a questa manovra.
- Se l'occlusione non si elimina, aspirare tutto il calcestruzzo presente nella tubazione per scaricarne la pressione, spegnere la macchina e smontare il pezzo di tubazione interessato dall'occlusione.

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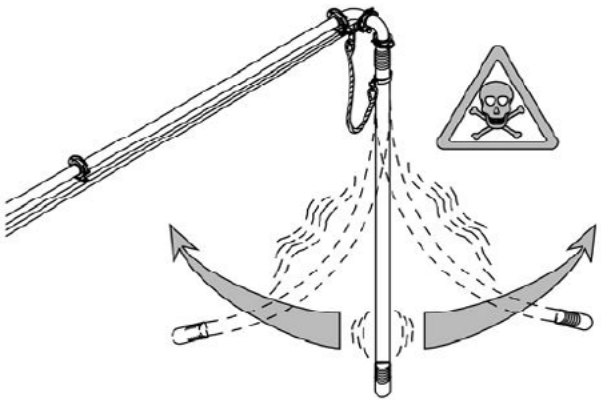
Rischi legati all'utilizzo del tubo terminale in gomma



Il tubo terminale in gomma deve rimanere ancorato all'ultimo elemento del braccio distributore per mezzo dell'apposito cavo di sicurezza.

È vietato manovrare o trattenere il tubo terminale in gomma.

Non sostare nel raggio d'azione del tubo terminale in gomma.

Sblocchi improvvisi di eventuali intasamenti nella tubazione, possono trasmettere violenti colpi di frusta.

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Rischi residui

Le targhe e gli adesivi sotto elencati indicano i rischi residui che permangono nonostante le misure di protezione integrate nella progettazione della macchina e i dispositivi di sicurezza adottati:

- rischio di schiacciamento;
- spruzzi di calcestruzzo;
- fuoriuscite di olio idraulico in pressione;
- contatto violento con il tubo terminale per movimenti improvvisi dello stesso;
- contatto con parti ad elevata temperatura.

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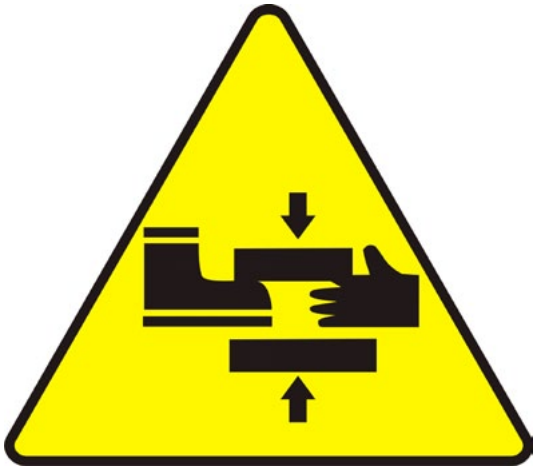

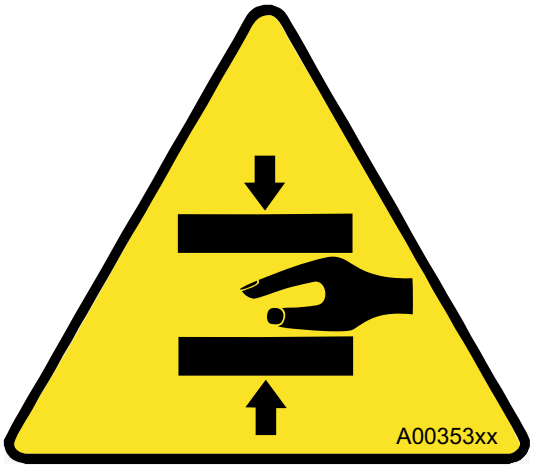

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2. DESCRIZIONE DELLA MACCHINA

Il braccio di distribuzione calcestruzzo semovente cingolato GERRIS 800 si utilizza per la distribuzione del calcestruzzo da svolgere in qualsiasi posizione compresa nel suo raggio di lavoro (vedi DIAGRAMMA DI LAVORO, pag. 34), sia in ambiente esterno che interno.

Deve essere utilizzata nel rispetto dei dati tecnici esposti nell'apposita tabella, su suoli di accertata consistenza e solidità e in condizioni di verificata sicurezza operativa da parte di Operatore Qualificato.

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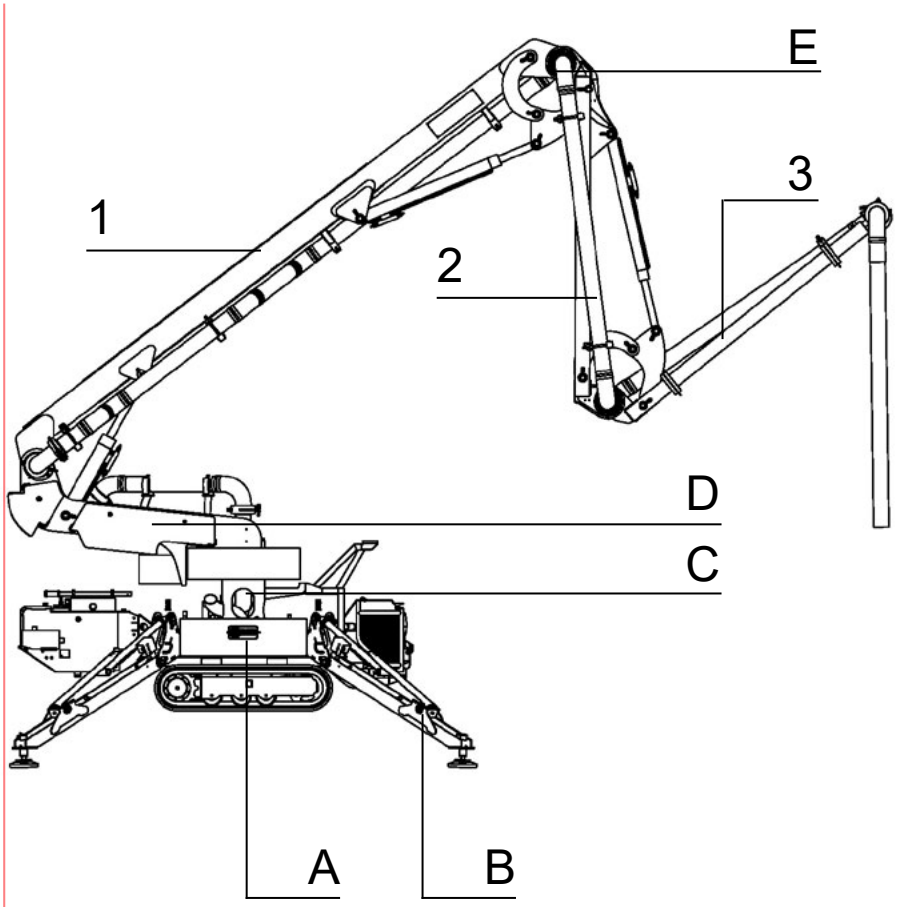

È costituita da:

A. Carro base
B. Stabilizzatori
C. Colonnetta
D. Torretta
E. Braccio distributore

Il sistema di sollevamento del braccio distributore 'E', sostenuto dalla torretta, è composto da 3 strutture principali azionate da cilindri idraulici:

1. Braccio di sollevamento principale
2. Secondo braccio
3. Terzo braccio

Componenti principali

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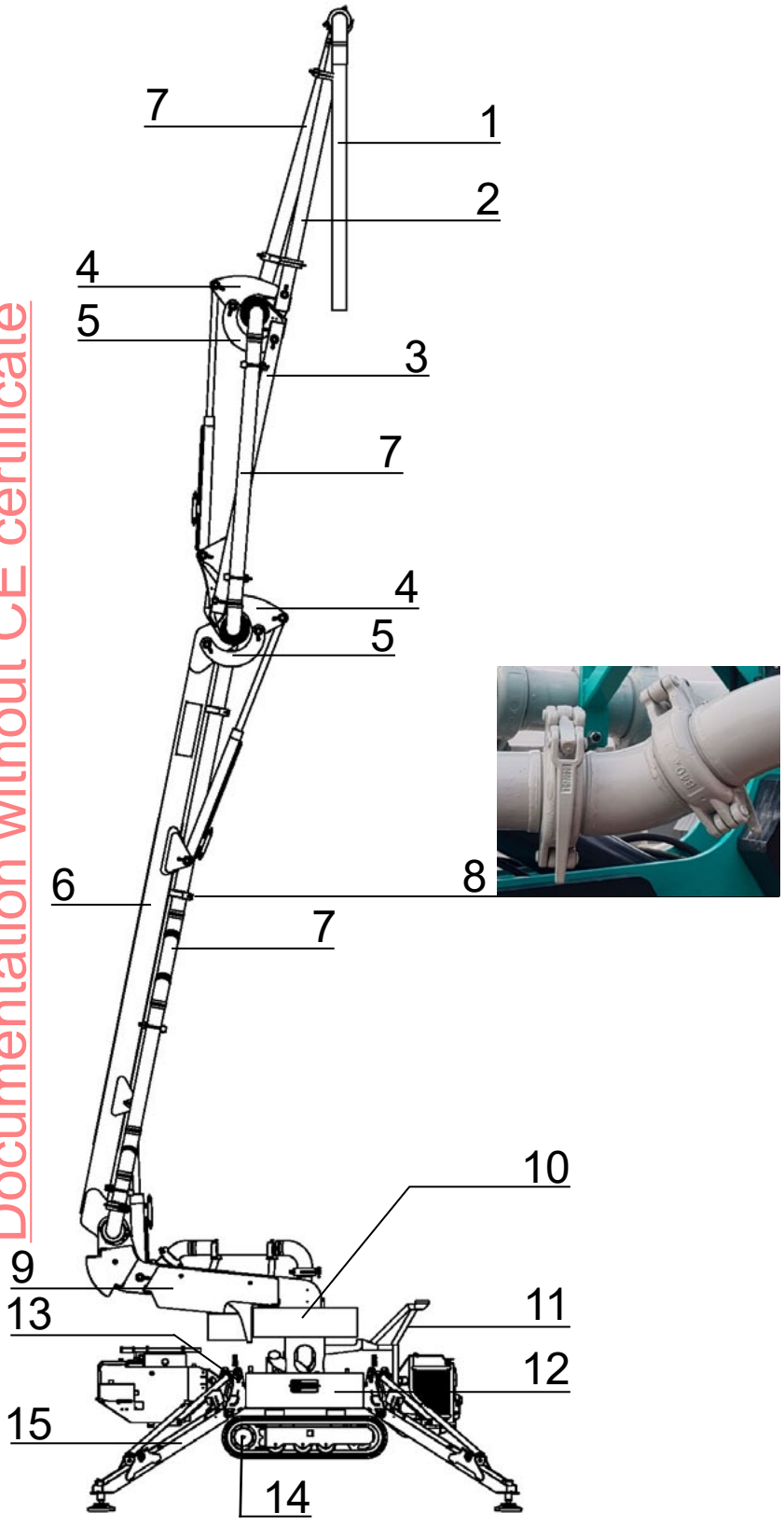
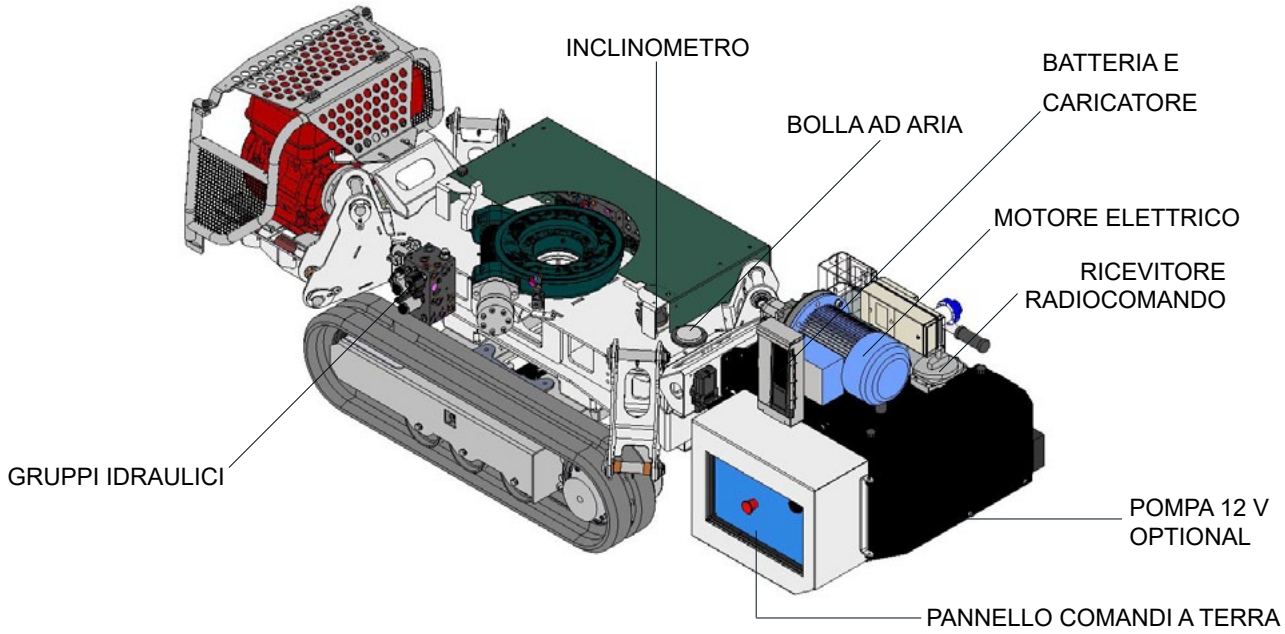


LATO SINISTRO

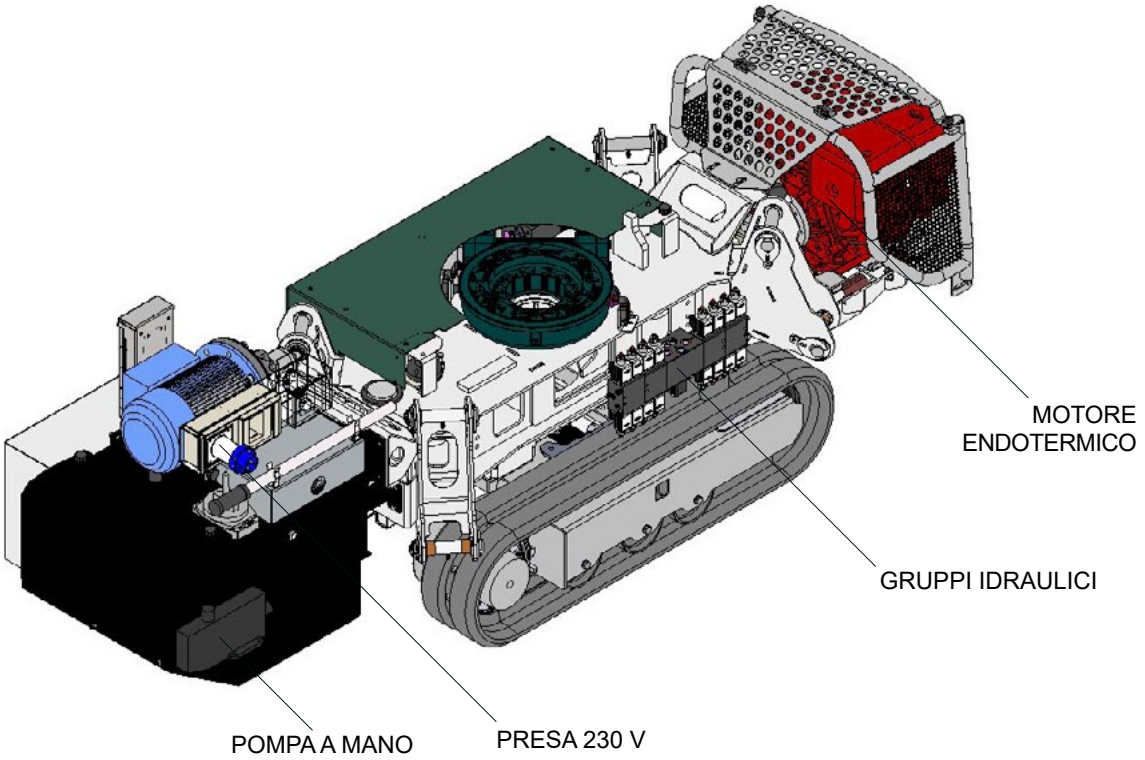
1. Tubo terminale in gomma
2. Terzo braccio
3. Secondo braccio
4. Bilancieri
5. Bielle
6. Braccio principale
7. Tubazioni
8. Giunti a leva
9. Torretta e zavorre
10. Colonnetta
11. Ricovero braccio distributore
12. Box sinistro
13. Carro base
14. Ruote motrici
15. Stabilizzatori

Dispositivi di comando e potenza

Lato destro



Lato sinistro



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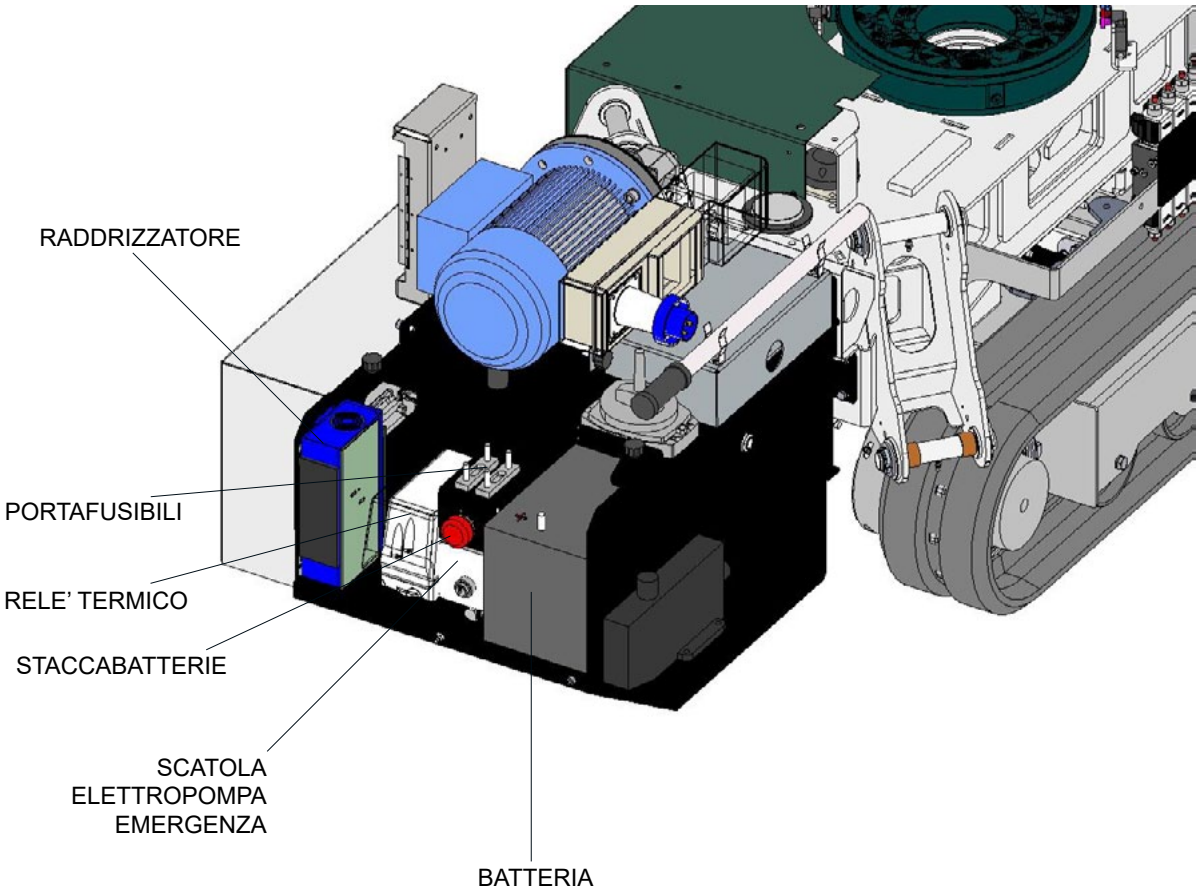
Lato serbatoio



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Circuito elettronico

L'equipaggiamento elettronico prevede i seguenti dispositivi elettronici a microprocessore per il funzionamento della macchina.

- Due centraline principali poste dietro il pannello comandi di terra.
- Ricevitore per radiocomando (in comunicazione tramite il protocollo di trasmissione CAN Bus con le due schede principali).
- Pulsantiera con display (in comunicazione con il ricevitore mediante filo o radio).

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Circuito elettrico

La tensione di alimentazione deve essere conforme ai dati di targa del motore elettrico. A pieno carico deve risultare compresa tra 205 V e 240 V.

Per alimentare la macchina occorre utilizzare un cavo 2 poli + terra, al fine di garantire il collegamento della macchina all'impianto equipotenziale di cantiere.

Dimensionamento cavo di alimentazione

La linea dell'alimentazione elettrica deve essere adeguatamente dimensionata per evitare cadute di tensione. Evitare l'impiego di avvolgitori. Il dimensionamento dei conduttori del cavo di alimentazione elettrica deve tener conto delle correnti di funzionamento e della lunghezza della linea per evitare eccessive cadute di tensione.

Sezione cavo (mm^2)			
1.5	2.5	4.0	Lunghezza cavo (m)
0 - 8	9 - 13	14 - 22	

I cavi di alimentazione utilizzati sul cantiere devono avere un idoneo rivestimento esterno resistente allo schiacciamento e all'usura oltre che agli agenti atmosferici.

Per la conformità dell'impianto di alimentazione attenersi alla norma CEI-64-8 (documento di armonizzazione CENELEC HD384).

Proporzionalità dei comandi

La trazione e tutti i movimenti del sistema di sollevamento sono a comando proporzionale: in base ai movimenti dei manipolatori sulla pulsantiera un sistema elettronico fornisce più o meno energia ai distributori elettroidraulici che regolano la portata di olio agli attuatori idraulici.

Radiocomando

Il radiocomando è un sistema di controllo remoto digitale, basato su tecnologia a microprocessore, protetto contro i disturbi elettromagnetici ed i disturbi radio.

Il radiocomando è composto da:

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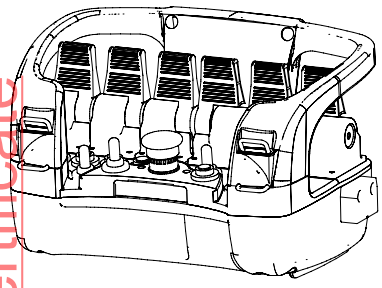
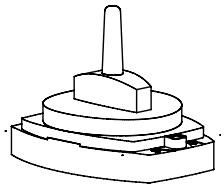
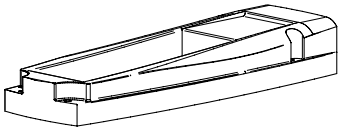


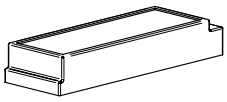
- una **UNITÀ DI CONTROLLO PORTATILE (PULSANTIERA)** con manipolatori per il controllo proporzionale delle movimentazioni (interruttori e pulsanti per le funzioni ON/OFF, spie di segnalazione, LCD grafico);



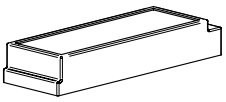
- una **UNITÀ RICEVITORE;**



- un **CARICABATTERIE;**



- due **BATTERIE** per la pulsantiera;



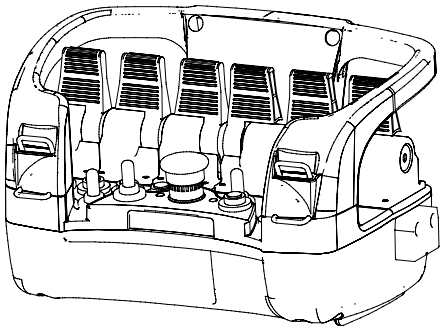
- un **CAVO SERIALE.**

La pulsantiera ed il ricevitore sono abbinati in modo che un radiocomando azioni solo la macchina per cui è predisposto.

Dove non si può utilizzare il radiocomando (ad esempio negli aeroporti) è possibile connettersi alla pulsantiera:

- tramite il cavo comandi seriale collegato al ricevitore (il cavo è contenuto all'interno della scatola portadocumenti).

Pulsantiera



L'unità di controllo portatile è robusta, resistente alle intemperie, leggera e compatta.

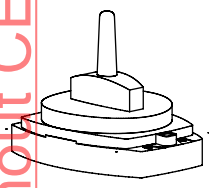
Le leve e i joystick di manovra sono proporzionali con ritorno a molla al centro. La pulsantiera è dotata di un pulsante a fungo con funzione di arresto d'emergenza per fermare immediatamente tutti i movimenti.

I manipolatori sono circondati da una cornice di protezione contro l'attivazione accidentale e contro i danni meccanici.

Un LED e un segnale acustico sono usati per indicare il funzionamento regolare, lo stato della carica della batteria e come strumento diagnostico per l'individuazione di eventuali malfunzionamenti.

La pulsantiera per funzionare utilizza una batteria inserita nella parte inferiore (vedi "Batteria pulsantiera").

Ricevitore



La centralina elettronica è contenuta in un robusto box plastico ed è fornita con connettori a cui collegare la pulsantiera.

Le indicazioni di stato e di allarme sono segnalate attraverso un display a 7 segmenti posto sul ricevitore.

In caso di malfunzionamento sul display verrà visualizzato "Er" seguito da quattro caratteri divisi in due blocchi corrispondenti al codice d'errore riscontrato.

Se il problema riscontrato è considerato "temporaneo", il codice d'errore sarà ripetuto 3 volte e poi il radiocomando ritornerà in standby, come appena acceso.

Diversamente, se il malfunzionamento è considerato "bloccante", il display mostrerà il codice d'errore continuamente fino a quando il radiocomando sarà spento.

Il codice di errore può manifestarsi dopo l'avvio del ricevitore o dopo l'avvio della pulsantiera (abilitazione modalità operativa).

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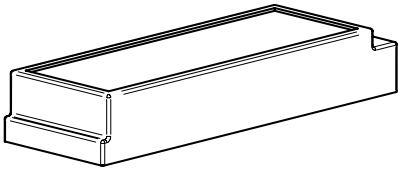
Batteria pulsantiera per radiocomando

La batteria inserita nella parte inferiore della pulsantiera, permette l'utilizzo via radio. In dotazione viene fornita un'altra batteria da mettere sempre in carica nel carica batterie.

La sostituzione è rapida e molto semplice da effettuare. L'operatività di una batteria carica è di circa 8 ore.



Quando la batteria sta per esaurirsi, la pulsantiera emette tre segnali acustici come avvertimento e il LED ON rosso inizia a lampeggiare (led a sinistra del fungo di emergenza). In condizioni di batteria carica il LED ON rosso è acceso.

La batteria deve essere utilizzata fino a quando il LED ON rosso si spegne, dopo di che deve essere cambiata. Se la capacità della batteria è troppo bassa, la pulsantiera potrebbe non accendersi.

La capacità della batteria e le prestazioni operative sono ridotte in condizioni di estremo freddo. La batteria si ricarica automaticamente durante l'utilizzo della pulsantiera con il cavo seriale.

Al fine di ridurre al minimo il consumo della batteria e per motivi di sicurezza, la pulsantiera si spegne automaticamente dopo un periodo di inattività di 30 minuti.

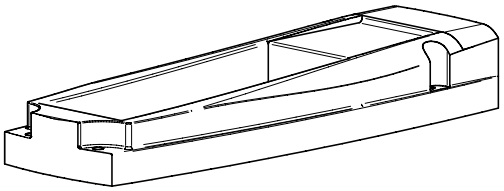
Caricabatterie

Il caricabatterie si trova alloggiato nella scatola sul fianco destro del carter di portezione del motore elettrico.

È alimentato dalla batteria 12 V per l'avviamento del motore ed è stato progettato per non danneggiare la batteria anche se sottoposta a lunghi cicli di carica continua.

Nella parte superiore del caricabatterie vi sono due indicatori a LED:

- **LED rosso** (alimentazione) - indica la presenza della tensione d'alimentazione;
- **LED verde** (stato di carica):
  - **lampeggiante**, la batteria è in carica (il caricabatteria è in modalità di carica veloce);
  - **acceso fisso**, la batteria è carica (il caricabatterie è in modalità di mantenimento carica).



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Ricarica della batteria radiocomando

Il caricabatterie avvia un ciclo di carica quando una batteria è inserita (il LED verde inizia a lampeggiare). La ricarica della batteria del radiocomando avviene in due fasi consecutive:

- prima fase con un elevata corrente, per raggiungere in breve tempo il livello di carica nominale;
- seconda fase con una corrente ridotta, per mantenere la carica raggiunta fino a quando la batteria sarà rimossa.

Il tempo impiegato normalmente per ricaricare una batteria esaurita è di circa 3 ore (il LED verde è acceso fisso).

Se la tensione al dispositivo viene a mancare, il caricabatteria ricorda l'ultima modalità di lavoro e riprende a caricare in modo "veloce" o in modo "mantenimento" quando l'alimentazione viene ripristinata.

In via precauzionale il caricabatterie smette sempre di caricare dopo 3 ore, anche se la batteria non ha raggiunto la carica completa. A carica avvenuta il LED verde resterà sempre acceso.

Carica della batteria con cavo seriale

Se l'operatore sta utilizzando la pulsantiera con il cavo seriale collegato, la batteria presente nel vano porta batteria verrà automaticamente ricaricata.

In caso di bisogno la pulsantiera può essere utilizzata come strumento alternativo per la carica delle batterie anche quando il sistema non viene utilizzato.

Inserire la batteria nell'apposito alloggio (pulsante d'emergenza della pulsantiera premuto) e collegare il cavo seriale tra pulsantiera e ricevitore. Il tempo di carica è di circa 12-14 ore.

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Dati tecnici

Descrizione	Unità di misura	GERRIS 800
Altezza massima	m	11,2
Sbraccio massimo	m	7,8
Profondità di getto	m	5,0
Ingombro macchina stabilizzata	m	2,92 - 3,08
Velocità di trazione	km/h	0 - 2,5
Velocità di sicurezza (*abilitazione a macchina aperta*)	km/h	0 - 0,4
Pendenza superabile	°	18
Massima inclinazione laterale ammessa del carro	°	1
Rotazione torretta	°	355
Motore endotermico	kW/omdr.	8.2/3600
Motore elettrico	V/kW	230/2,2
Batteria	V/Ah	12/110 C20
Caricabatteria	V/A	12 /12
Carico massimo stabilizzatori	daN	1930
Massa della macchina	kg	2500
Serbatoio olio	l	30
Livello di potenza sonora misurato	dB	102
Livello di potenza sonora garantito	dB	104
Larghezza di trasporto (senza supporto tubazione / con supporto)	m	0,8/1,04
Lunghezza di trasporto	m	4,9
Altezza di trasporto	m	2
Massima pressione idraulica	bar	230
Temperature di utilizzo	°C	-20 ÷ +40

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Pressioni al suolo

Pressione del cingolo = 0,90 kg/cm$^{2.}$

Pressione del piattello stabilizzatore = 4,34 kg/cm^2 (piattello standard diametro 20 cm).

Pressione del piattello stabilizzatore = 1,42 kg/cm^2 (piattello optional diametro 35 cm).

Dimensioni e ingombri

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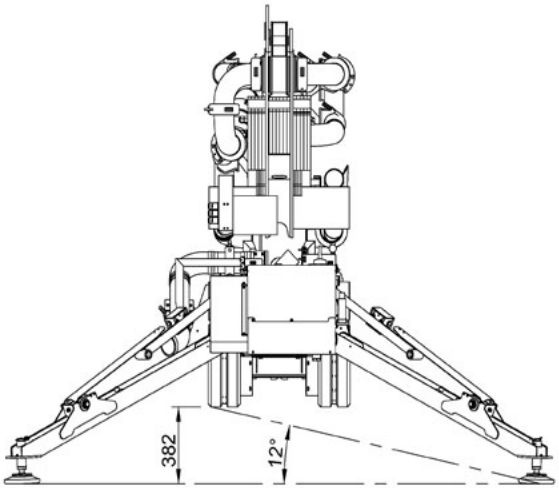

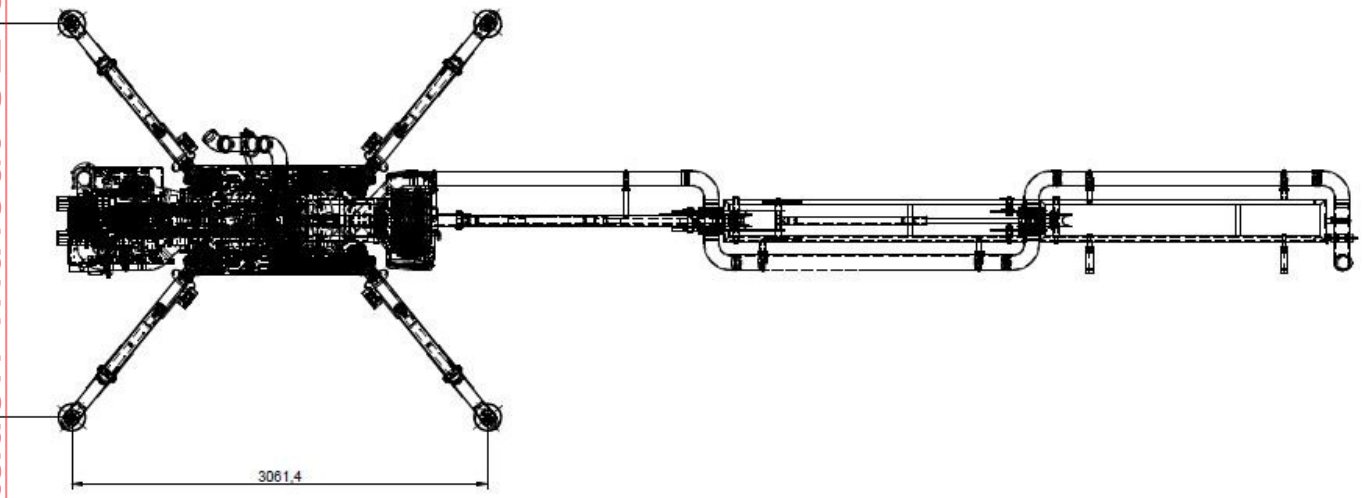

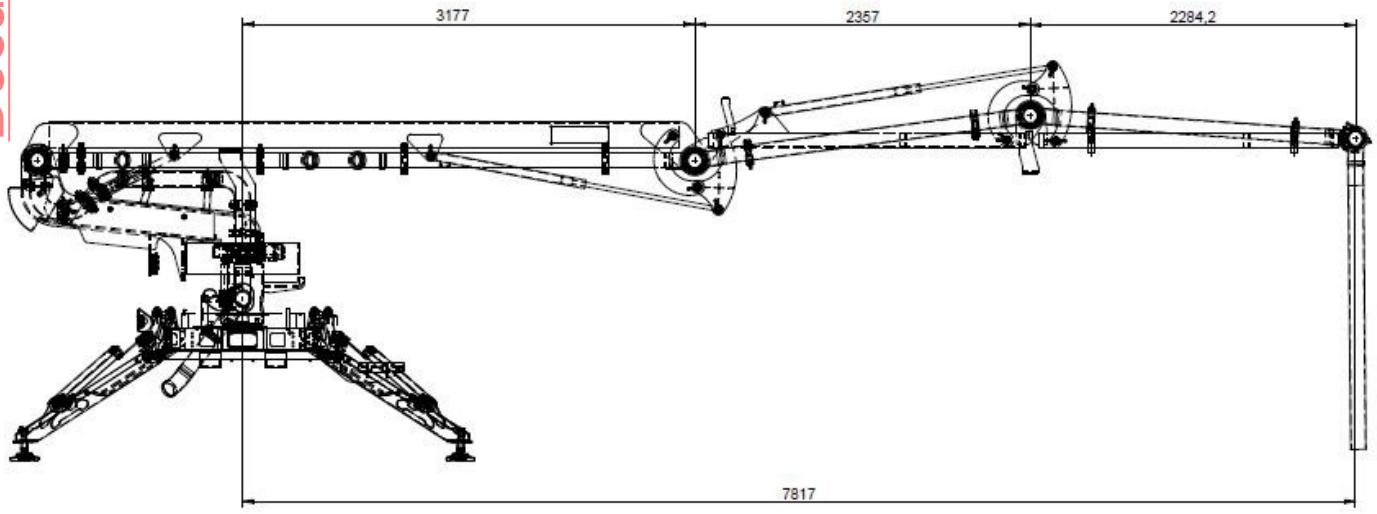

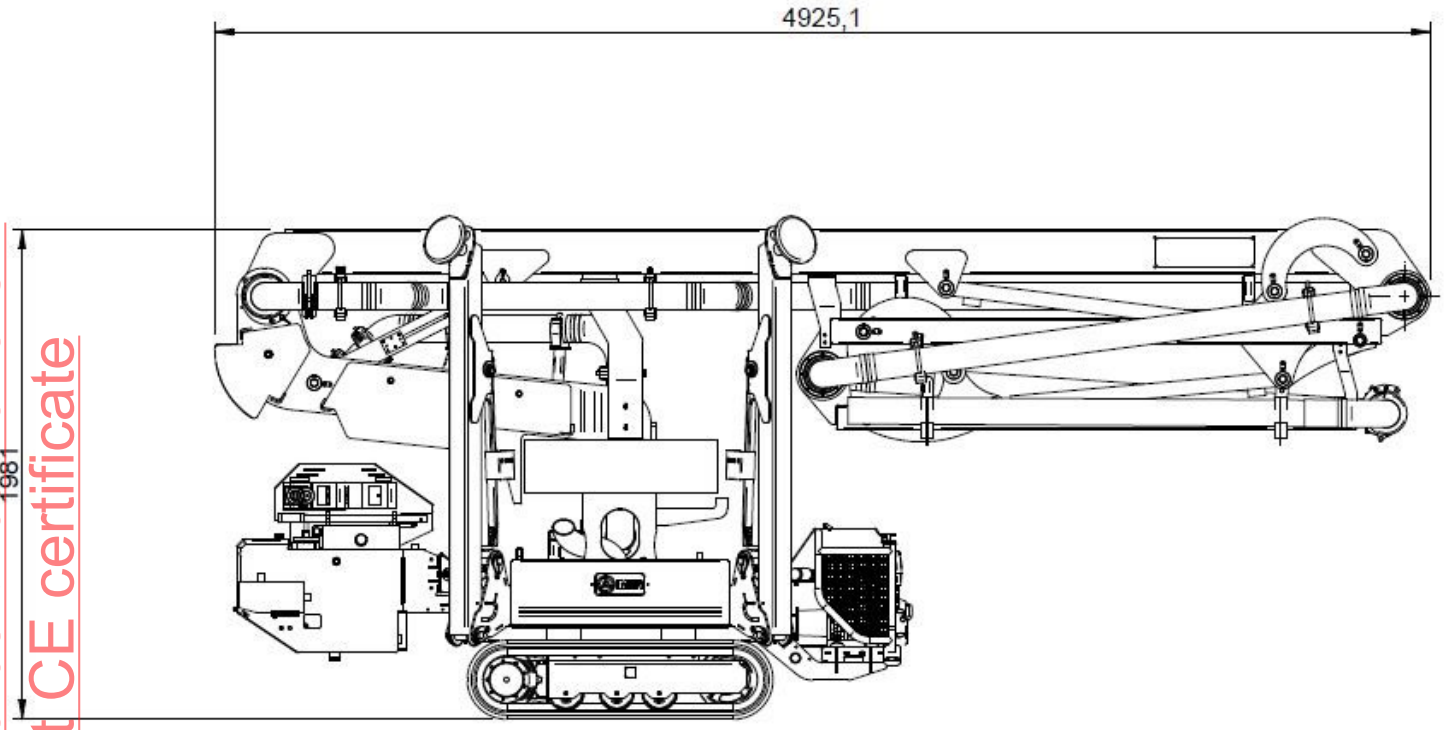

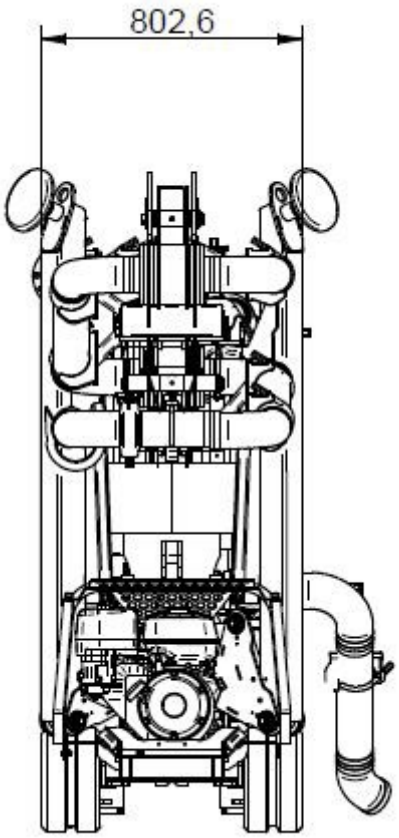

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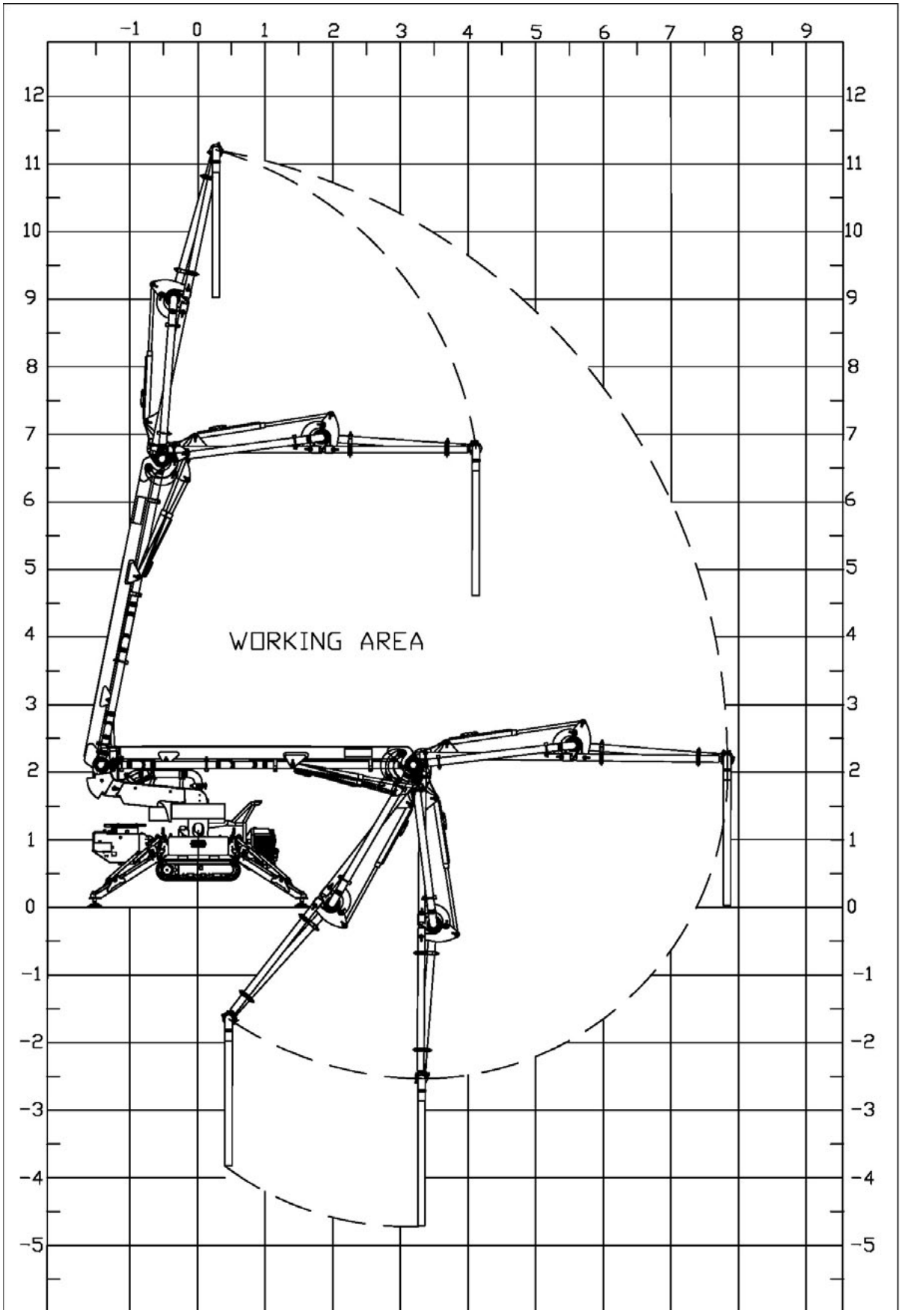
Diagramma di lavoro



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Targhe e adesivi

Verificare con le figure la presenza di tutte le targhe e adesivi.

Gli adesivi o le targhe che non contengono testo hanno codice alfanumerico che termina con XX, o numerico a 8 cifre.

Gli adesivi o le targhe che contengono testo hanno codice alfanumerico che termina con la sigla del paese di destinazione della macchina.

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3237323	MADE IN ITALY	1
82021098	BANDE G/N (H70)	12
A00001XX	MARCHIO CE	1
A00110XX	PRESA CARICABATTERIA	1
A00145XX	DOCUMENT BOX	1
A00148XX	CARICO MAX STABILIZ	4
A00150XX	PERICOLO SCHIACCIAMENTO	4
A00174XX	TIPO DI OLIO ISO VG 46	1
A00190XX	GANCI DI SOLLEVAMENTO	4
A00296XX	DISTANZA LINEE ELETTRICHE	1
A00322XX	LOGO BIANCO (346X116)	4
A00353XX	PERICOLO SCHIACCIAMENTO MANI	7
A00357XX	ALLINEAMENTO TORRETTA	2
A00361XX	LETTERE BLOCCHI IDRAULICI	1
A00362XX	CAVO SERIALE	1
A00363XX	FUNE PER TRASPORTO	4
A00364XX	MAGNETOTERMICO	1
A00380XX	FRECCIA DIREZIONE	2
A00517XX	GERRIS 800 (GRANDE)	2
A00518XX	GERRIS 800 (PICCOLO)	2
A00508XX	BLOCCO EMERGENZE B	1
A00509XX	BLOCCO PRINCIPALE A	1
A00536XX	BLOCCO EMERGENZE C	1

A00289XX	POTENZA SONORA (VERSIONE B)	1

A00033IT	EMERGENZA	1
A00034IT	POMPA DI EMERGENZA	1
A00103IT	PROIBITO SOSTARE	6
A00383IT	TOGLIERE LA CHIAVE	1
A00537IT	TARGA IMMATRICOLAZIONE	1

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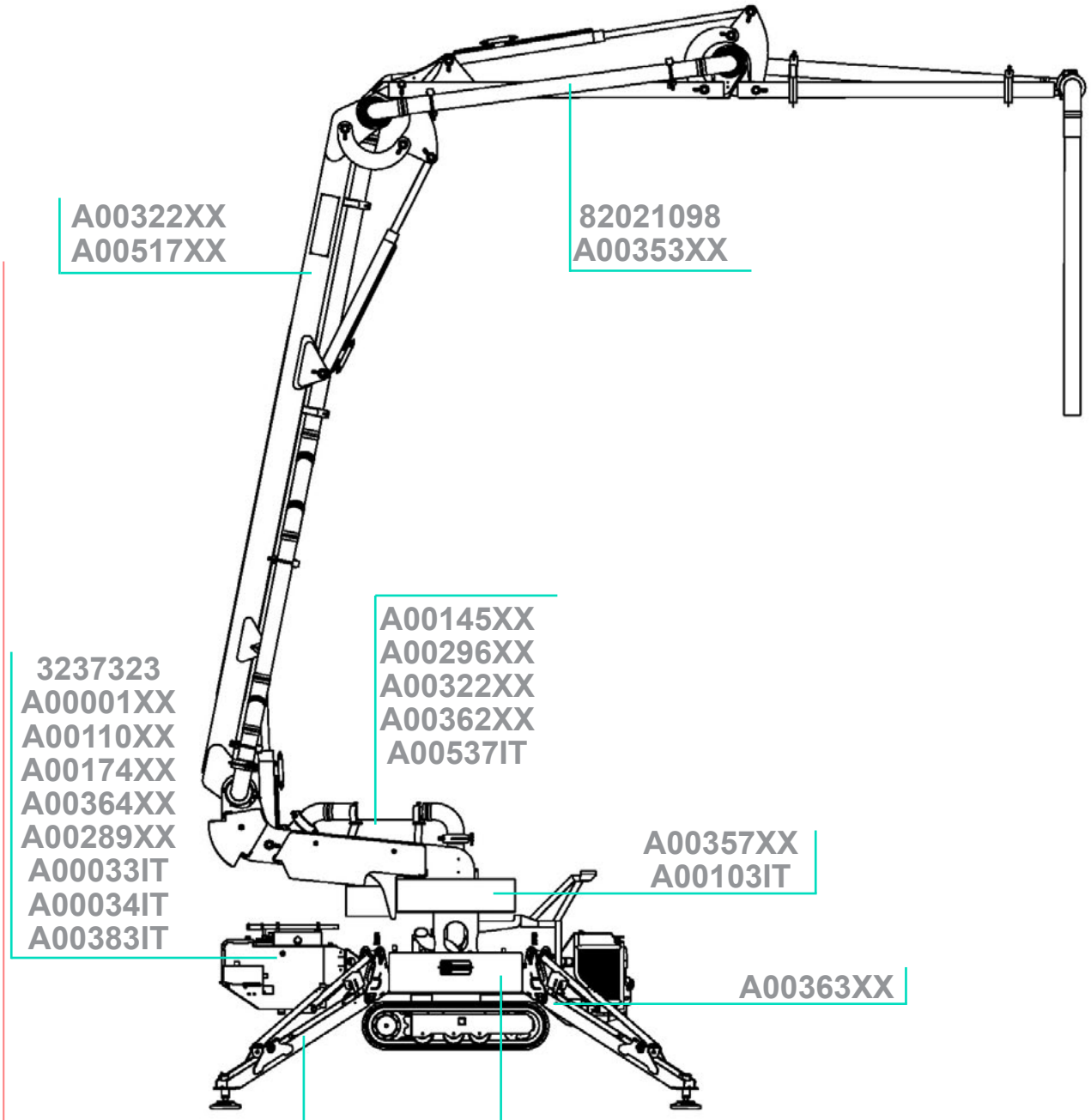

Identificazione

Una targa metallica fissata sulla torretta porta incise tutte le indicazioni che servono per identificare la macchina.

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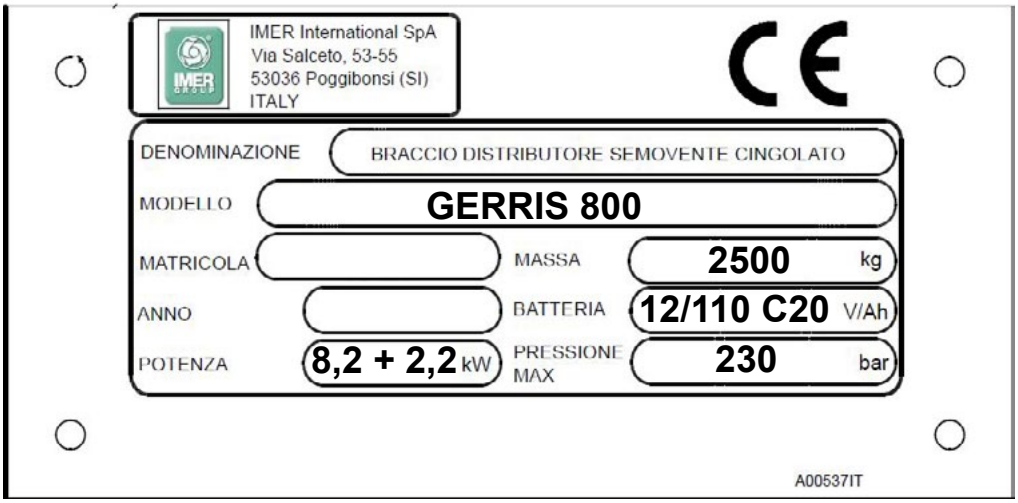

I dati sono riferiti alla versione standard

Allestimento standard

- Movimenti proporzionali e simultanei
- Kit tubazioni 4”
- Radiocomando wireless
- Elettropompa 230 V - 16 A per utilizzo da rete elettrica
- Motori a doppia velocità
- Freni negativi di stazionamento
- Cingoli in gomma
- Cingoli allargabili idraulicamente
- Rotazione torretta di 355°
- Stabilizzazione automatica con inclinometro elettronico
- Valvole di blocco sui cilindri
- Discesa manuale d’emergenza
- Doppi comandi da terra e da pulsantiera
- Contaore elettronico
- Avvisatore acustico movimenti
- Spina stacca batteria
- Presa, spina e salvavita per linea 230 V
- Marcatura CE–EN280
- Kit abilitazione trazione a macchina aperta

Optional

- Kit cingoli no marking
- Elettropompa di emergenza 12 V
- Kit Imerview
- Kit piattelli speciali (d.350)
- Kit tubazioni 2”

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Movimenti della macchina

Movimenti di terra - Movimenti aerei

I movimenti si riferiscono a due parti della macchina: la parte di terra e la parte aerea.

La parte di terra è costituita dal carro (con cingoli e stabilizzatori).

I movimenti di terra sono:

- trazione e sterzo della macchina;
- apertura e chiusura dei cingoli;
- stabilizzazione.

La parte aerea è costituita dal sistema di sollevamento.

I movimenti della parte aerea sono:

- salita / discesa braccio principale;
- rotazione torretta;
- apertura / chiusura secondo braccio;
- apertura / chiusura terzo braccio.

In base alle posizioni che la macchina può assumere (vedi STATO DELLA MACCHINA) possono essere eseguiti i movimenti di terra e/o aerei.

I movimenti aerei non sono consentiti se è abilitata la trazione a macchina aperta.

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Movimenti di terra

Trazione e sterzo

Per fare trazione il carro base monta due motori idraulici che movimentano dei cingoli in gomma. Lo sterzo si ottiene muovendo i cingoli a velocità diverse.

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Allargamento cingoli

L'allargamento dei cingoli permette di ottenere maggiore stabilità negli spostamenti in cantiere o in zone impervie.

Il movimento è azionato da un cilindro idraulico posto nella parte interna del carro.

Stabilizzazione

La stabilizzazione avviene tramite 4 cilindri idraulici.

Può essere automatica o manuale.

Automatica

Oltre alla discesa contemporanea degli stabilizzatori, la stabilizzazione automatica prevede anche il livellamento della macchina con tolleranza inferiore a 1° (con un errore di ± 0,1°).

Manuale

Ogni stabilizzatore viene abbassato od alzato singolarmente.

Il non raggiungimento del livellamento è una condizione non ottimale; tuttavia il sistema elettronico della macchina non impone nessun blocco dei movimenti, poichè si è comunque in sicurezza, fino alla soglia dei 2° (in tal caso i movimenti vengono bloccati - riferirsi al paragrafo 'Controllo inclinazione carro'). È discrezione dell'operatore continuare ad utilizzare la macchina o portare la macchina in stabilità (entro 1° di inclinazione).

Se la macchina non è correttamente livellata se ne pregiudica la stabilità creando rischi per l'operatore e per le persone che lavorano in prossimità della macchina.

Movimenti aerei

Salita / discesa braccio principale

Il movimento è azionato da un cilindro idraulico posto tra la torretta e il braccio.

Rotazione torretta

Il movimento è azionato da un motore idraulico che muove una ralla posta sulla colonnetta. La torretta ruota di 355°.

Apertura / chiusura secondo braccio

Il movimento è azionato da un cilindro idraulico posto tra il braccio principale e il primo bilanciere.

Apertura / chiusura terzo braccio

Il movimento è azionato un cilindro idraulico posto tra il telaio del secondo braccio e il secondo bilanciere.

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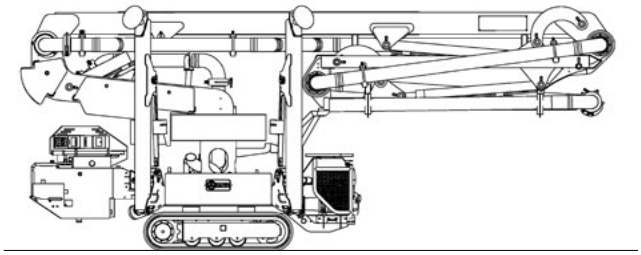
Stato della macchina

Nel presente manuale vengono utilizzati dei termini per indicare lo stato o posizione della macchina, in base al quale è possibile eseguire movimenti diversi.

Ogni stato della macchina viene visualizzato sul display della pulsantiera.

Macchina ricoverata

La macchina è RICOVERATA quando il braccio distributore è in appoggio sul supporto del carro e nessuno stabilizzatore in appoggio.



Lo stato di macchina ricoverata permette:

- lo SPOSTAMENTO della macchina mediante trazione e sterzo;
- la STABILIZZAZIONE della macchina.

Lo stato di macchina ricoverata è l'unica posizione che permette il movimento degli stabilizzatori.

Lo stato di macchina ricoverata è la posizione in cui si deve trovare la macchina ad inizio e a fine lavori.

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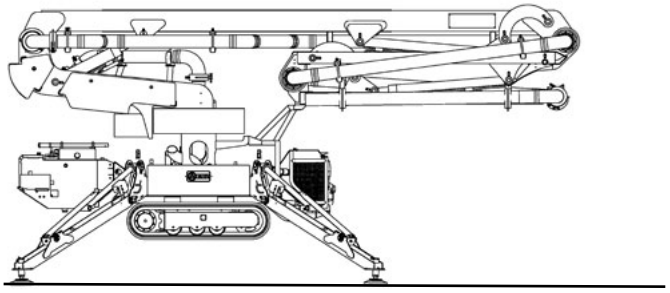
Macchina stabilizzata ricoverata

La macchina è STABILIZZATA RICOVERATA quando tutti e 4 gli stabilizzatori sono in appoggio, la torretta è allineata e il braccio distributore è in appoggio sul supporto del carro.

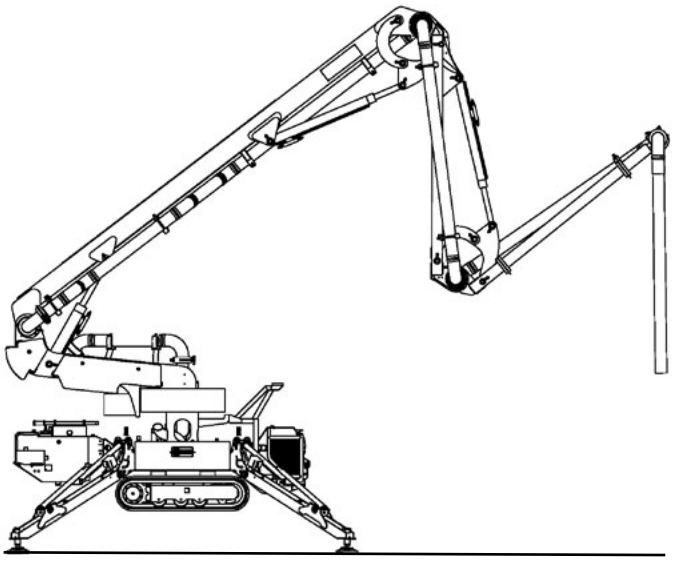


Lo stato di MACCHINA STABILIZZATA RICOVERATA permette di:

- iniziare ad aprire il sistema di sollevamento alzando il braccio principale ad inizio lavori;
- ritornare allo stato di MACCHINA RICOVERATA sollevando gli stabilizzatori a fine lavori.

Macchina aperta

La macchina è considerata APERTA quando dallo stato STABILIZZATA RICOVERATA viene attivata la parte aerea.



Dalla posizione di MACCHINA APERTA si possono eseguire tutti i movimenti della parte aerea ad esclusione di quelli riguardanti il secondo e terzo braccio (per quest'ultimi devo aver prima sollevato il braccio principale di 10° rispetto al piano ralla).

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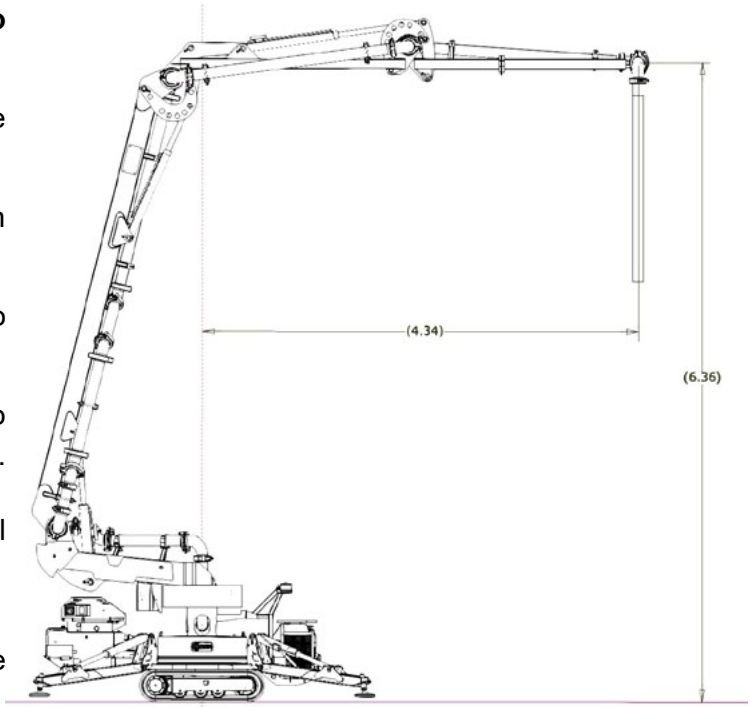
Abilitazione trazione a macchina aperta

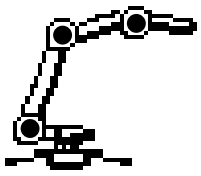
Il kit **abilitazione trazione** permette la traslazione della macchina aperta nel rispetto **contemporaneo** dei seguenti vincoli:

- **braccio di sollevamento principale aperto** secondo le quote in figura;
- **secondo braccio aperto** secondo le quote in figura;
- **terzo braccio aperto** secondo le quote in figura;
- **torretta ruotata** massimo ±90° rispetto all'asse di braccio ricoverato;
- **carro base inclinato** massimo ±3° (in caso contrario viene visualizzata l'icona).



La corretta apertura dei tre bracci è segnalata dal riempimento dei pallini nell'icona .

Una volta posizionati tutti gli elementi, viene visualizzata l'icona:



Da questa posizione la macchina permette l'innalzamento degli stabilizzatori. Gli stabilizzatori si distanziano dal terreno per una quota sufficiente a permettere la trazione in sicurezza (icona **OK**). I **movimenti aerei vengono bloccati**. In caso di contatto di uno o più stabilizzatori con il terreno, la trazione verrà interrotta.

In modalità trazione a macchina aperta **è consentito**:

- traslare la macchina in velocità di sicurezza in tutte le direzioni;
- stabilizzare la macchina, tornando nello stato di macchina aperta.

La modalità trazione a macchina aperta **non è consentita** in caso di:

- apertura di uno dei tre bracci ad angoli diversi da quelli ammessi;
- rotazione torretta oltre i ±90°;
- inclinazione del carro oltre i ±3°;
- contatto di uno o più stabilizzatori con il terreno.

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Sistemi di sicurezza

Sulla macchina sono previsti dei dispositivi di sicurezza che ne bloccano il normale funzionamento per evitare danni a cose o persone.

La conoscenza delle caratteristiche e del funzionamento delle sicurezze è fondamentale; si consiglia pertanto di non far funzionare la macchina senza prima aver letto ed assimilato la seguente sezione.

Poichè in base alle posizioni che la macchina può assumere i dispositivi di sicurezza si attivano oppure no, è importante conoscere la CONFIGURAZIONE e il significato di STATO DELLA MACCHINA illustrati nelle pagine precedenti.

Il mancato funzionamento di un dispositivo di sicurezza, causato da un guasto o da una manomissione, può causare gravi danni alla macchina e, di conseguenza, mettere in pericolo la vita dell'operatore.

Verificare periodicamente i dispositivi di sicurezza secondo quanto descritto nel manuale.

I dispositivi di sicurezza non devono mai essere manomessi. Il costruttore declina ogni responsabilità per incidenti imputabili a interventi e manomissioni degli stessi.

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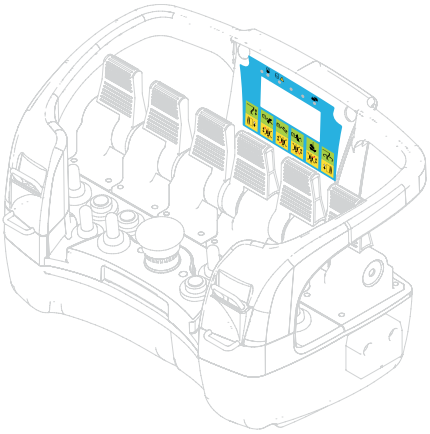
Anomalie

In caso di malfunzionamento rilevato dall'autodiagnosi delle centraline principali della macchina, sul display della pulsantiera verrà visualizzato un codice di errore.



Segnalazioni acustiche

Condizione anomala: viene segnalata da un suono intemittente ad alta frequenza. I movimenti della macchina vengono bloccati tutti o in parte fino a quando non si riporta la macchina in condizioni di funzionamento in sicurezza.

Normale funzionamento: qualsiasi movimento della macchina viene segnalato da un suono intemittente a bassa frequenza.

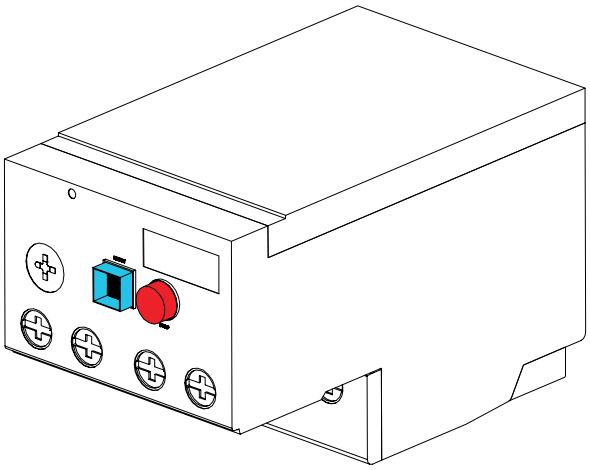
Relè termico

Il relè termico protegge il motore elettrico da eventuali sovraccarichi di corrente.

È posizionato nell'alloggio serbatoio, all'interno della scatola di protezione.

In presenza di un sovraccarico il relè termico interrompe il cicuito di alimentazione al motore.

Dopo aver verificato ed eliminato la causa del sovraccarico, per riarmare il motore premere il tasto blu di reset del relè.



Il tasto rosso si utilizza per eseguire il test del relè (vedi "Manutenzione del motore elettrico").

Sensore filtro olio ostruito

È costituito da un sensore posto sul filtro olio del circuito idraulico.
Se il filtro è ostruito tutte le movimentazioni sono rallentate al 40% del massimo consentito.

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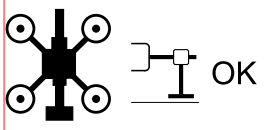
Sensore d'inclinazione e livella a bolla d'aria

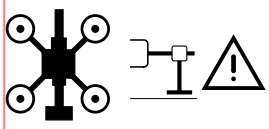
Si ricorda che la massima inclinazione del carro è 1 grado.

Sono due i dispositivi utilizzati per controllare l'inclinazione della macchina: **il sensore d'inclinazione** e la **livella a bolla d'aria**.

Il sensore d'inclinazione è integrato nel sistema di autolivellamento: è un sensore ad angolo che, posto nella parte anteriore del carro ne rileva l'angolazione. Sul display compaiono le seguenti icone:

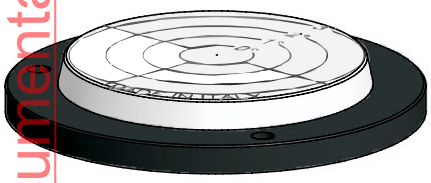


- il carro ha un'inclinazione massima di 1° rispetto lo zero, con un errore di ± 0,1°;



- il carro è inclinato di oltre 1°.

Il livellamento automatico è un aiuto elettronico che aumenta notevolmente la facilità d'uso della macchina. È comunque d'obbligo verificare SEMPRE durante e dopo la fase di livellamento la corretta inclinazione della macchina mediante la bolla ad aria.



La livella a bolla d'aria è posizionata nella parte anteriore del carro.

Durante la fase di livellamento della macchina utilizzare la livella a bolla d'aria per controllare che il limite ammesso di inclinazione di 1° venga rispettato.

Dopo ogni operazione di livellamento controllare sempre la corretta inclinazione della macchina.

Se la macchina non è correttamente livellata se ne pregiudica la stabilità creando rischi per l'operatore e per le persone che lavorano in prossimità della macchina.

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Microinterruttori

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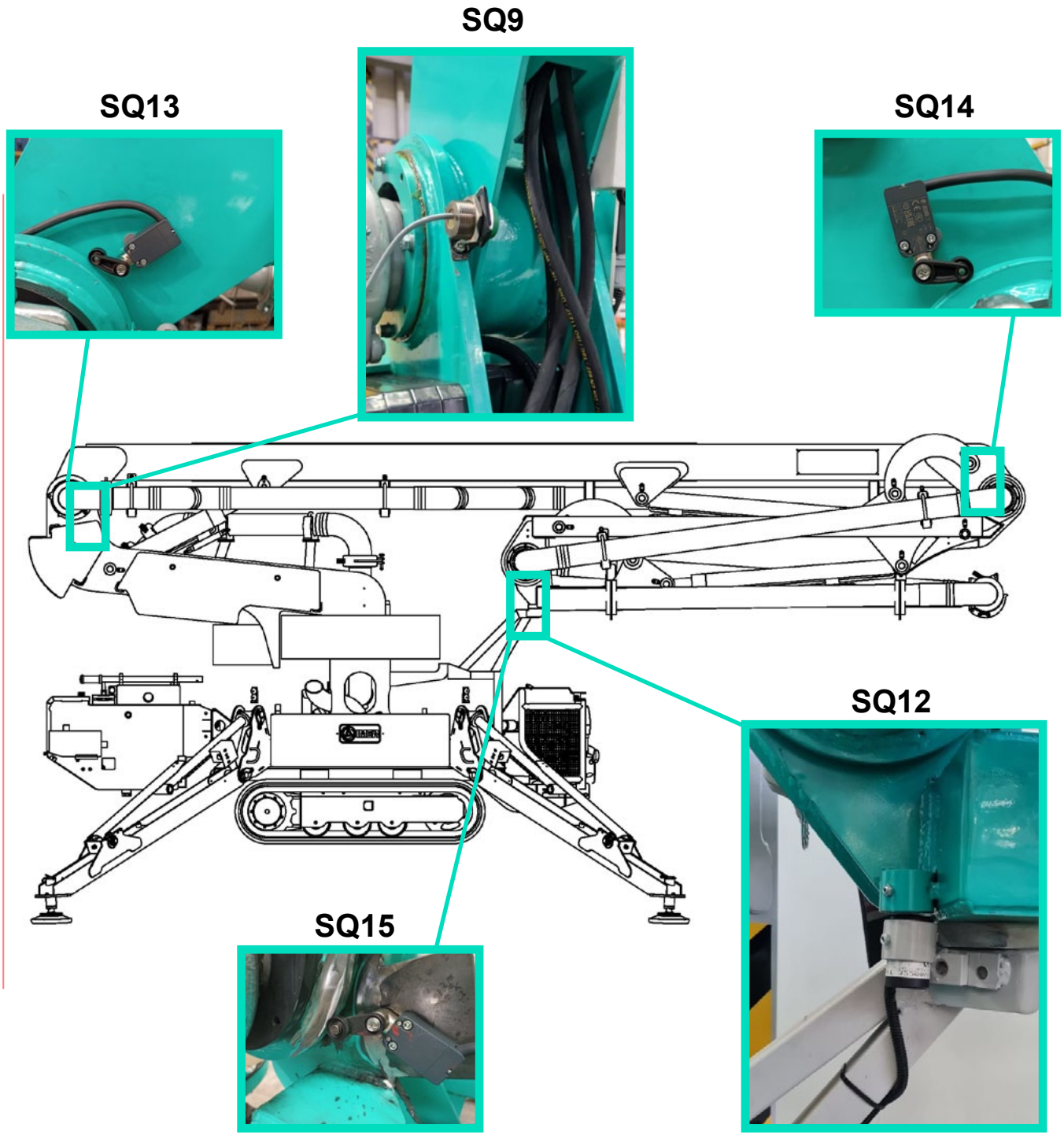

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Microinterruttore SQ12 (ricovero)

SQ12 è un magnete posto alla base del supporto braccio presente sul carro: l'avvicinarsi del braccio distributore ne verifica la corretta chiusura.

Con MACCHINA RICOVERATA (braccio distributore in sede) ***è possibile eseguire:***

- la trazione a tutte le velocità;
- la discesa e/o salita stabilizzatori.

Con MACCHINA RICOVERATA STABILIZZATA ***è possibile:***

- alzare il braccio principale.

Fatto questo, si può eseguire la rotazione della torretta.

Microinterruttore SQ9 (attivazione secondo e terzo braccio)

SQ9 è un magnete posto sull'incernieratura del braccio principale con la torretta e ne rileva la soglia di inclinazione necessaria all'attivazione del secondo e terzo braccio.

Con BRACCIO PRINCIPALE inclinato MENO di 10° rispetto al piano ralla ***è possibile eseguire:***

- i movimenti aerei del braccio principale e della torretta.

NON è possibile eseguire:

- i movimenti aerei del secondo e terzo braccio.

Con BRACCIO PRINCIPALE inclinato PIÙ di 10° rispetto al piano ralla ***è possibile eseguire:***

- tutti i movimenti aerei.

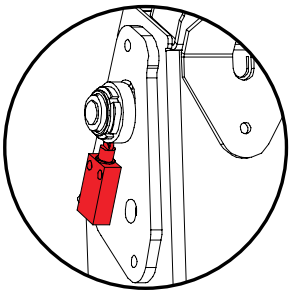
Microinterruttori SQ13-14-15

SQ13 SQ14 SQ15 sono posti in prossimità delle articolazioni dei bracci di sollevamento.

Controllano il posizionamento dei bracci per poter abilitare la trazione a macchina aperta.

- Quando tutti e tre i micro sono in posizione corretta (indicata sul display) è possibile abilitare la trazione a macchina aperta.
- Se uno dei tre bracci esce dagli angoli ammessi, la trazione viene disabilitata.

Microinterruttori SQ3-4-5-6



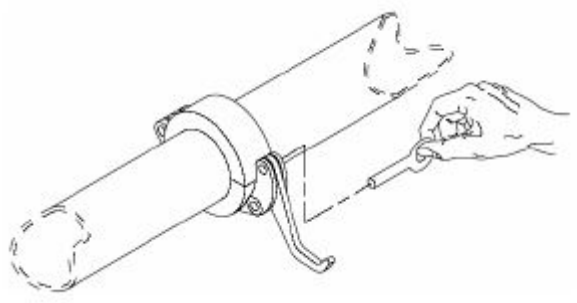
SQ3 SQ4 SQ5 SQ6 sono posti in prossimità del perno di fissaggio stelo dei cilindri stabilizzatori.

Controllano la messa in pressione degli stabilizzatori.

- Quando anche un solo stabilizzatore è in appoggio viene bloccata la trazione.
- Se tutti e 4 gli stabilizzatori sono in appoggio è possibile muovere la parte aerea.
- Se abilitata la TRAZIONE A MACCHINA APERTA, il contatto di uno o più stabilizzatori con il terreno blocca la trazione.

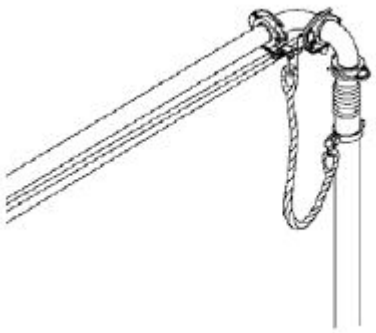
Spine di sicurezza giunti a leva

I giunti a leva della tubazione del calcestruzzo sono chiusi e bloccati per mezzo dell'apposita spina.



Cavo di sicurezza ancoraggio tubo terminale in gomma

Il tubo terminale in gomma è ancorato all'ultimo elemento del braccio per mezzo dell'apposito cavo di sicurezza.



Encoder torretta

L'encoder è un dispositivo elettronico collegato alla centralina principale tramite CANbus. Permette di rilevare, tramite l'angolo di rotazione, la posizione precisa della torretta.

Questo dispositivo permette di:

- rilevare la posizione di centraggio per il corretto ricovero;
- confermare la posizione della torretta per l'abilitazione della trazione a macchina aperta.

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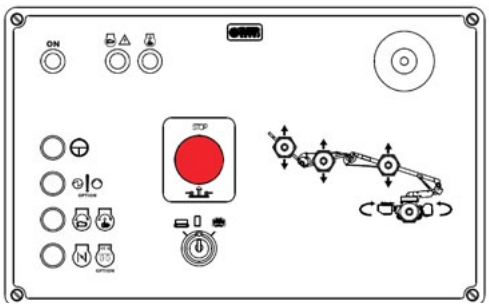
Dispositivi di emergenza

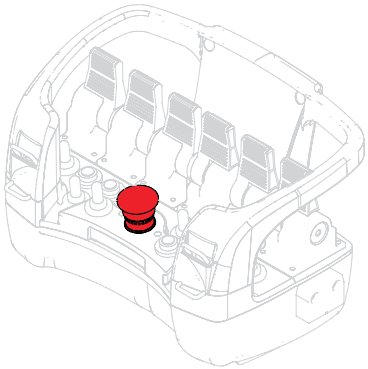
Sulla macchina sono previsti dei dispositivi di emergenza.

La conoscenza delle caratteristiche e del funzionamento delle emergenze è fondamentale; si consiglia pertanto di non far funzionare la macchina senza prima aver letto ed assimilato la seguente sezione.

Stop di emergenza

Il pulsante a fungo di emergenza si trova sul pannello comandi a terra e sulla pulsantiera.

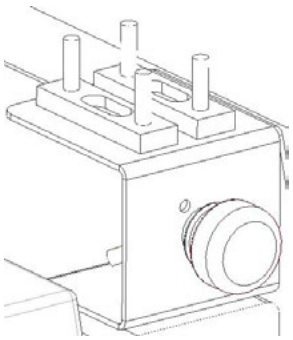




La pressione di uno o di entrambi i pulsanti blocca tutti i movimenti, permettendo l'arresto immediato di ogni funzione della macchina in situazioni di emergenza.

Per ripristinare le normali funzioni ruotare in senso orario il pulsante.

Staccabatterie



Lo staccabatterie è posizionato nel box anteriore (zona serbatoio).

Questo dispositivo di sicurezza interrompe i circuiti di potenza e di comando dalle batterie, bloccando tutti i movimenti.

Deve essere azionato in caso di fermo prolungato della macchina o per interventi di manutenzione alle apparecchiature elettriche.

Elettrovalvole per movimenti di emergenza

I blocchi idraulici presenti sulla macchina sono dotati di elettrovalvole utilizzate per i movimenti di emergenza.

Si rimanda il funzionamento al paragrafo "Procedure manuali di emergenza".

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Pompa a mano

La pompa a mano è posizionata sul lato sinistro del serbatoio olio, mentre la leva per azionarla è posta al di sopra dello stesso.

La pompa a mano serve a mandare olio in pressione per eseguire manovre in casi di emergenza o di guasto.

Si rimanda il funzionamento al paragrafo “Procedure manuali di emergenza”.

Elettropompa 12 V (optional)

L’elettropompa è posizionata sotto il serbatoio olio.

L’elettropompa serve a mandare olio in pressione per eseguire manovre in casi di emergenza o di guasto.

Si rimanda il funzionamento al paragrafo “Procedure manuali di emergenza”.

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Posti di comando

I posti di comando previsti per l'operatore sono:

- pulsantiera utilizzata a terra;
- pannello comandi a terra.

L'utilizzo della pulsantiera esclude il pannello comandi a terra e viceversa.

Il pannello comandi a terra viene utilizzato principalmente in casi di emergenza o durante la manutenzione. Dal pannello comandi a terra non è possibile eseguire trazione, sterzo e stabilizzazione.

La pulsantiera deve sempre essere accesa, anche se si utilizzano i comandi del pannello a terra.

I movimenti della macchina sono:

- Trazione (spostamento avanti e indietro)
- Sterzo
- Allargamento cingoli
- Stabilizzazione
- Salita / discesa braccio principale
- Rotazione torretta
- Apertura / chiusura secondo braccio
- Apertura / chiusura terzo braccio

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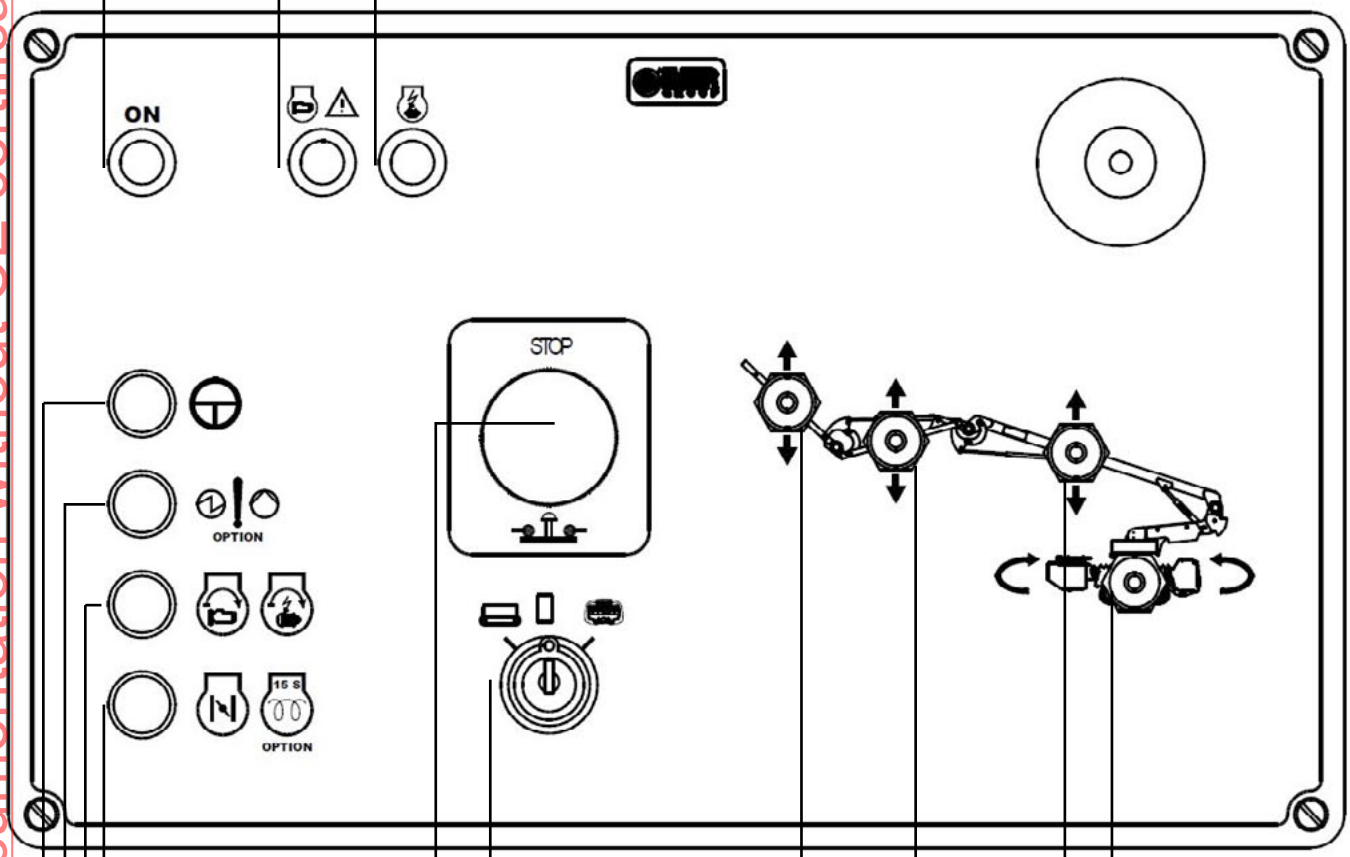
Pannelli comandi

Pannello comandi da terra



11 Spia luminosa macchina accesa (verde)

12 Spia rossa (A)

13 Spia verde (B)

6 Aria (motore benzina)

5 Start

4 Elettropompa di emergenza (optional)

3 Uomo presente

1 Selettore a chiave (3 posizioni)

2 Pulsante rosso arresto di emergenza

7 Rotazione **torretta**

8 Salita / discesa **braccio principale**

9 Apertura / chiusura **secondo braccio**

10 Apertura / chiusura **terzo braccio**

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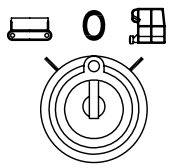
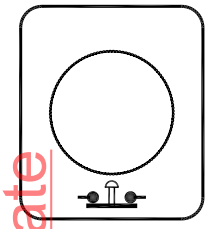


1 - Selettore a chiave (3 posizioni)

- Posizione al centro: la macchina è spenta.
- Posizione a destra: sono attivi i comandi da pulsantiera.
- Posizione a sinistra: sono attivi i comandi da pannello di terra.



2 - Pulsante rosso arresto di emergenza

- Premuto blocca tutte le funzioni della macchina.
- Rilasciato permette il funzionamento della macchina.

3 - Uomo presente

Ogni movimento della parte aerea, mediante i selettori da 7 a 10, viene eseguito solo tenendo premuto anche il pulsante 3, che ha la funzione di uomo presente.

4 - Elettropompa di emergenza (optional)

Accensione pompa elettrica di emergenza (optional).

5 - Start

Accensione motore endotermico (benzina). Se la macchina è collegata alla tensione di rete si accende il motore elettrico.

6 - Aria

Facilita l'accensione del motore se è freddo.

- Motore benzina: tenere premuto contemporaneamente con il pulsante 5 (start) per attivare l'aria del motore.

7....10 - Selettori movimenti parte aerea

Con i selettori 7 - 8 - 9 - 10 e il pulsante 3 (uomo presente), si eseguono i movimenti della parte aerea.

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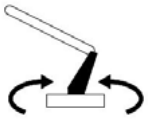
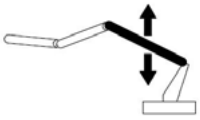


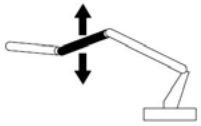
7 - Rotazione torretta

- Spostare il selettore 7 a destra per ruotare la torretta in senso antiorario.
- Spostare il selettore 7 a sinistra per ruotare la torretta in senso orario.



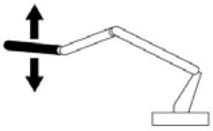
8 - Salita / discesa braccio principale

- Spostare il selettore 8 verso l'alto per sollevare il braccio principale.
- Spostare il selettore 8 verso il basso per abbassare il braccio principale.



9 - Apertura / chiusura secondo braccio

- Spostare il selettore 9 verso l'alto per aprire il secondo braccio.
- Spostare il selettore 9 verso il basso per chiudere il secondo braccio.



10 - Apertura / chiusura terzo braccio

- Spostare il selettore 10 verso l'alto per chiudere il terzo braccio.
- Spostare il selettore 10 verso il basso per aprire il terzo braccio.

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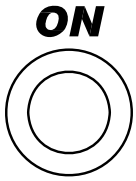
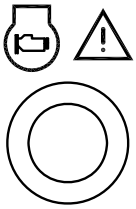


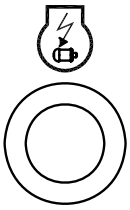
11 - Spia macchina accesa

La spia verde 11 si accende quando il selettore 1 non è in posizione centrale.



12 - Spia tensione di rete scollegata

Se la spia 12 rossa è accesa la tensione di rete è scollegata. All'accensione del motore endotermico la spia si spegne.



13 - Spia tensione di rete collegata

Se la spia 13 verde è accesa la tensione di rete è collegata. È possibile utilizzare il motore elettrico.

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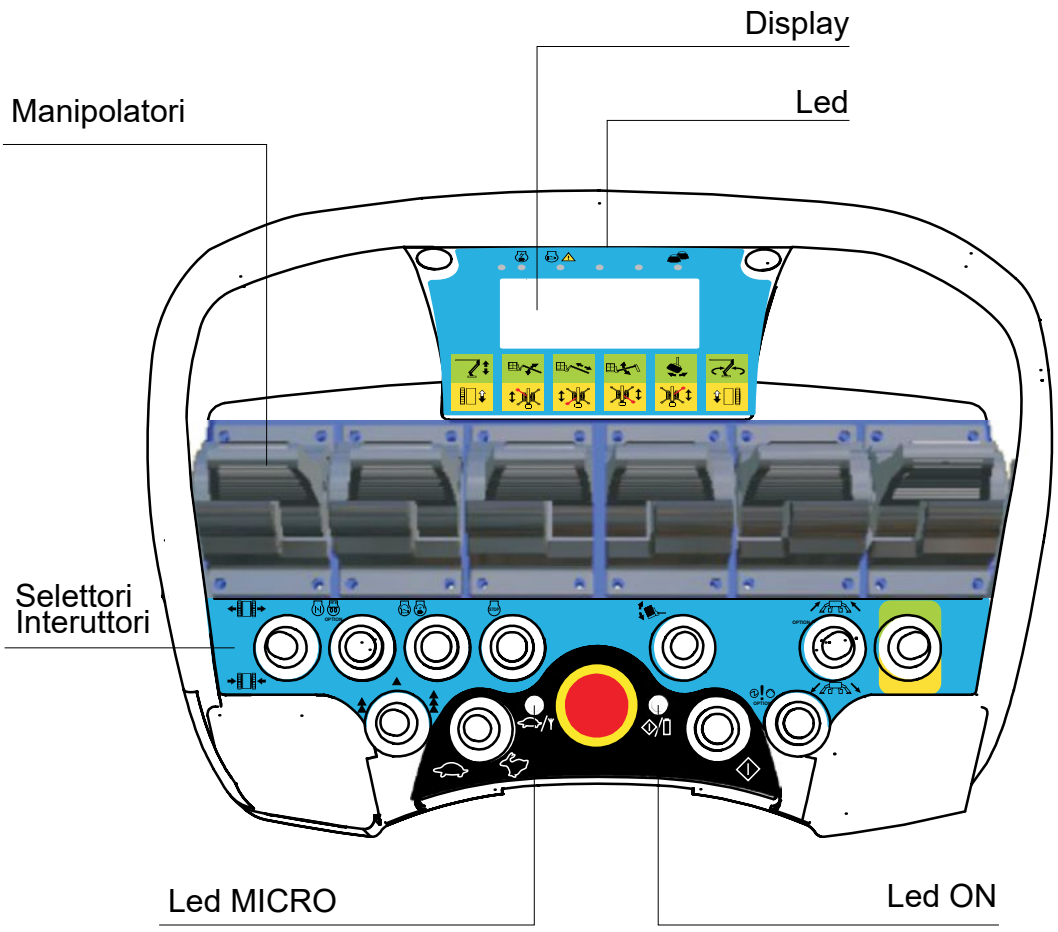
Pulsantiera

Accendere la pulsantiera con l'interruttore ed attendere l'accensione del LED ON rosso.



I LED ON e il LED MICRO indicano lo stato di funzionamento e gli allarmi.

LED ON rosso acceso: la pulsantiera è attiva e sta trasmettendo via cavo o via radio.

LED ON rosso che lampeggia una volta ogni secondo: la batteria si sta esaurendo. Questa indicazione è preceduta da tre segnali acustici emessi dal buzzer interno.

LED MICRO rosso acceso: comunicazione radio perduta.

LED MICRO verde spento: indica che è attiva la velocità LEPRE del motore endotermico.

LED MICRO verde lampeggiante: indica che è attiva la velocità TARTARUGA del motore endotermico.

Codice di errore

La pulsantiera esegue una verifica sulle proprie parti ad ogni accensione ed in caso riscontri anomalie manifesta un codice di errore facendo lampeggiare il LED ON rosso e suonare il buzzer interno un certo numero di volte, a seconda del tipo di errore riscontrato. Fare riferimento al manuale della pulsantiera allegato alla macchina.

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Selettori

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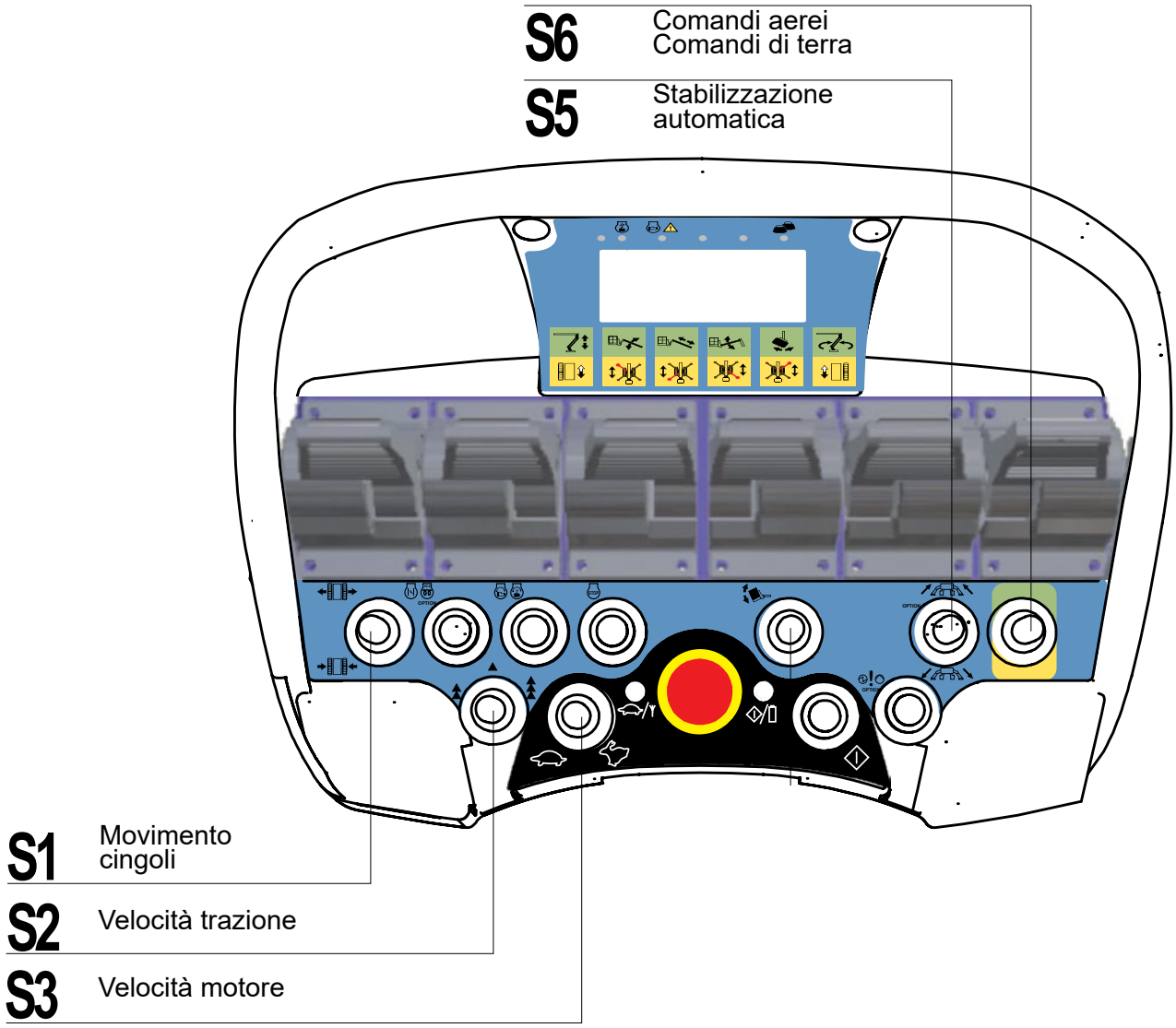
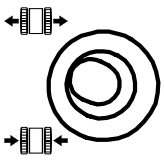


S1 - Movimento cingoli



- Avanti: allarga i cingoli.
- Indietro: restringe i cingoli.

L'allargamento cingoli è consentito a macchina ricoverata o stabilizzata.

S2 - Velocità trazione

- A destra: marcia veloce.
- Al centro e a sinistra: marcia di sicurezza.

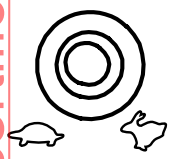
Con utilizzo motore endotermico

La selezione della velocità è attiva a macchina ricoverata.

Con utilizzo motore elettrico

La selezione della velocità non è attiva, la trazione avviene sempre in marcia di sicurezza.

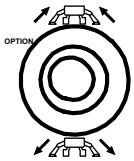
S3 - Velocità motore endotermico



- A destra: lepre - numero di giri più alto.
- A sinistra: tartaruga - numero di giri più basso.

In alcuni movimenti il motore utilizza il numero di giri più basso indipendentemente dalla posizione di S3.

S5 - Stabilizzazione automatica



- Avanti: sollevamento piedi destabilizzazione automatica.
- Indietro: discesa piedi stabilizzazione automatica.

La condizione necessaria per eseguire il movimento è il braccio distributore in sede di ricovero.

La macchina è LIVELLATA quando il carro ha un'inclinazione massima di 1° rispetto lo zero, con un errore di ± 0,1°.

S6 - Selezione movimenti

- Avanti: i manipolatori muovono la parte aerea.
- Indietro: i manipolatori eseguono i movimenti di trazione e sterzo (M1-M6), salita / discesa di ogni singolo cilindro stabilizzatore (M2-M3-M4-M5) per la stabilizzazione manuale.

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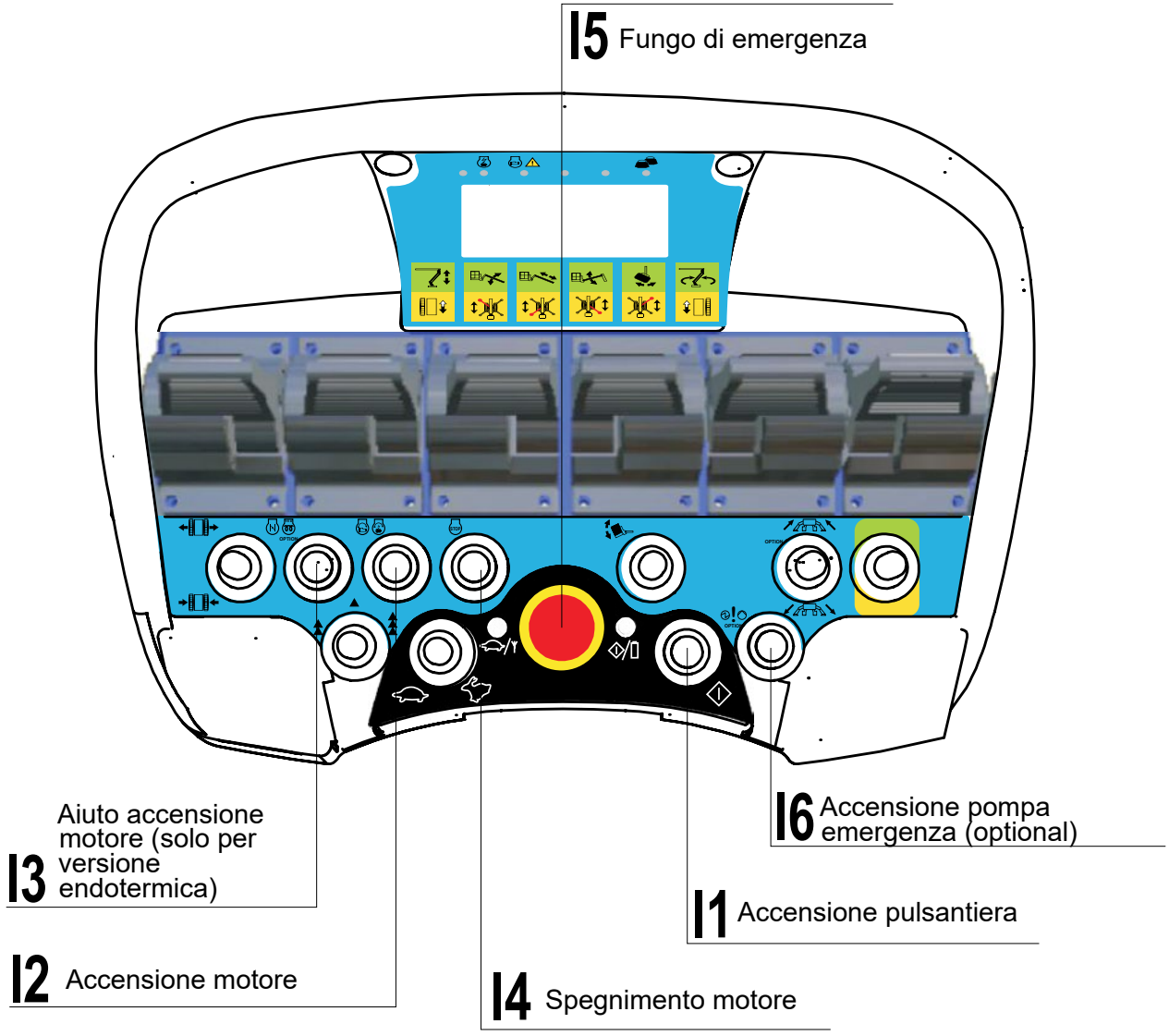
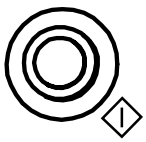
Interruttori



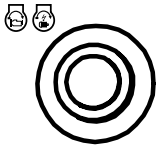
I1 - Accensione pulsantiera



Con l'interruttore I1 si accende la pulsantiera.

Per spegnere la pulsantiera si utilizza l'interruttore I5.

I2 - Accensione motore elettrico o endotermico



Se è collegata la tensione di rete si avvia il motore elettrico, se non è collegata la tensione di rete si avvia il motore endotermico.
Per avviare il motore endotermico a freddo vedi interruttore I3.

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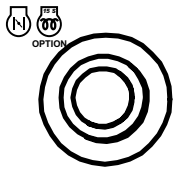
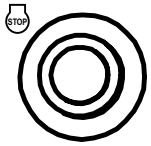
I3 - Aiuto accensione motore



Facilita l'accensione del motore a freddo.

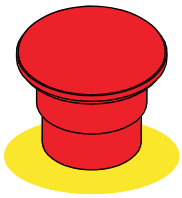
- **Motore benzina**: tenere premuto contemporaneamente con I2 per attivare l'aria del motore.

I4 - Spegnimento motore



Spegne il motore elettrico o endotermico.

I5 - Fungo di emergenza



Se premuto blocca tutta la macchina e spegne la pulsantiera. Per rilasciarlo ruotarlo in senso orario.

La pulsantiera deve essere riaccesa con I1.

I6 - Accensione pompa emergenza (optional)

Accende la pompa elettrica di emergenza (optional).

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Manipolatori

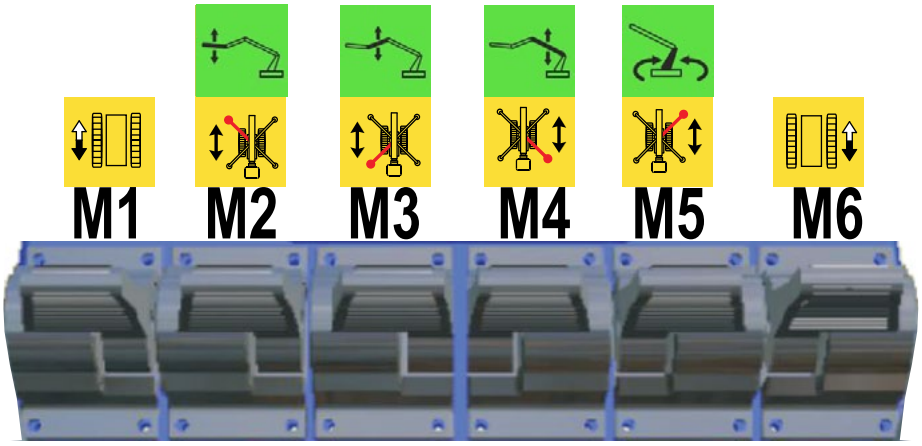

Tabella funzionamento manipolatori in base alla posizione del selettore S6.

S6 in avanti Movimenti parte aerea		
M1	Nessun utilizzo	
M2 - TERZO BRACCIO	Avanti	Chiusura
	Indietro	Apertura
M3 - SECONDO BRACCIO	Avanti	Apertura
	Indietro	Chiusura
M4 - BRACCIO PRINCIPALE	Avanti	Salita
	Indietro	Discesa
M5 - ROTAZIONE TORRETTA	Avanti	Rotazione in senso orario
	Indietro	Rotazione in senso antiorario
M6	Nessun utilizzo	

S6 indietro Movimenti parte di terra		
M1 - CINGOLO SINISTRO	Avanti	Avanti
	Indietro	Indietro
M2 - STAB. ANTERIORE SINISTRO	Avanti	Salita
	Indietro	Discesa
M3 - STAB. POSTERIORE SINISTRO	Avanti	Salita
	Indietro	Discesa
M4 - STAB. POSTERIORE DESTRO	Avanti	Salita
	Indietro	Discesa
M5 - STAB. ANTERIORE DESTRO	Avanti	Salita
	Indietro	Discesa
M6 - CINGOLO DESTRO	Avanti	Avanti
	Indietro	Indietro

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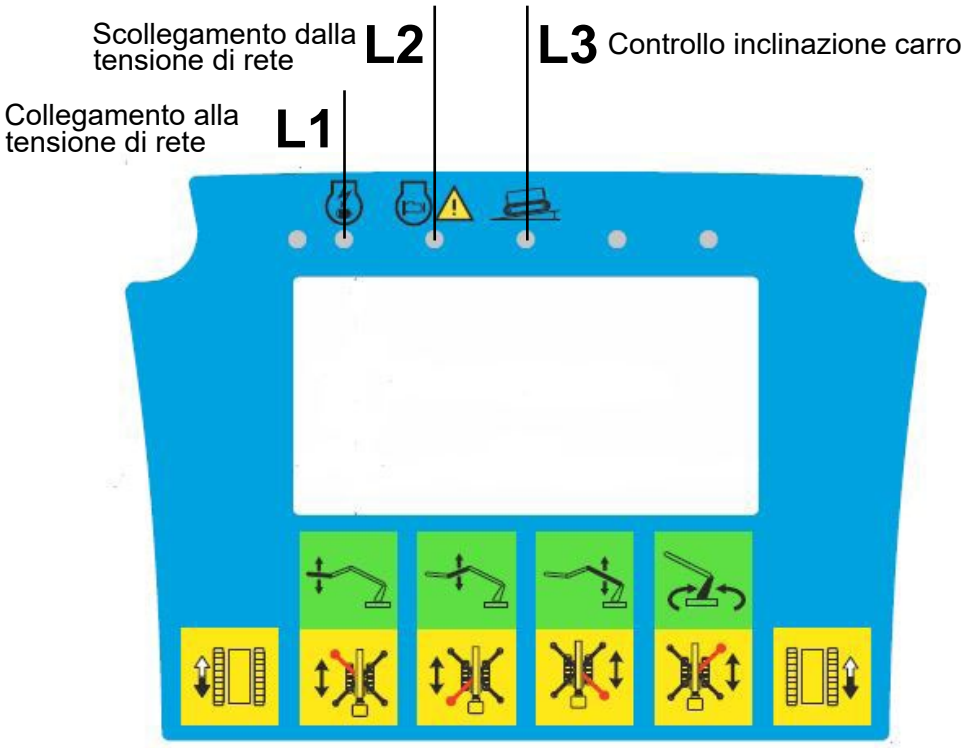
Barra dei Led



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L1 - Collegamento alla tensione di rete

Spia colore verde; se accesa la tensione di rete è collegata.

L2 - Scollegamento dalla tensione di rete

Spia colore arancio; se accesa la tensione di rete è scollegata. All'accensione del motore endotermico la spia si spegne.

L3 - Controllo inclinazione carro

Spia colore arancio; si accende, segnalando un preallarme e successivamente l'allarme, se l'inclinazione del carro in traslazione o durante il lavoro con macchina stabilizzata raggiunge i valori limite consentiti.

Display

Il display visualizza:

- Stato del motore
- Soglie di lavoro
- Stato della macchina

Stato del motore

Motore endotermico acceso

Olio nei motori

- Motore benzina: il livello olio è troppo basso.

Alternatore e stato della batteria d'accensione

- Spenta ad avviamento avvenuto: l'alternatore funziona.
- Accesa fissa: l'alternatore non sta funzionando.
- A motore spento, se lampeggia: indica che la batteria avviamento è scarica.

Filtro olio ostruito

- Il filtro olio del circuito idraulico è ostruito e occorre sostituirlo al più presto. Tutti i movimenti della macchina sono rallentati del 40% del massimo consentito.

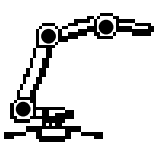
Soglie di lavoro

Inclinazione eccessiva

- L'icona segnala, sia in fase di traslazione (a macchina chiusa e a macchina aperta) sia quando la macchina è stabilizzata, se vengono raggiunte e superate le soglie di inclinazione.
- Macchina chiusa, icona intermittente: al raggiungimento della prima soglia (riduzione velocità di trazione e dei movimenti destabilizzanti in fase aerea).
- Macchina chiusa, icona fissa: al raggiungimento della seconda soglia.
- Macchina aperta, icona fissa e triangolo di avvertenza: al raggungimento della soglia di blocco trazione.

Centraggio torretta

- L'icona segnala il raggiungimento del centraggio della torretta (soglia per il corretto ricovero della macchina).



Stato di abilitazione trazione a macchina aperta

- L'icona segnala l'attivazione della trazione a macchina aperta (sono soddisfatti tutti i vincoli di posizionamento).

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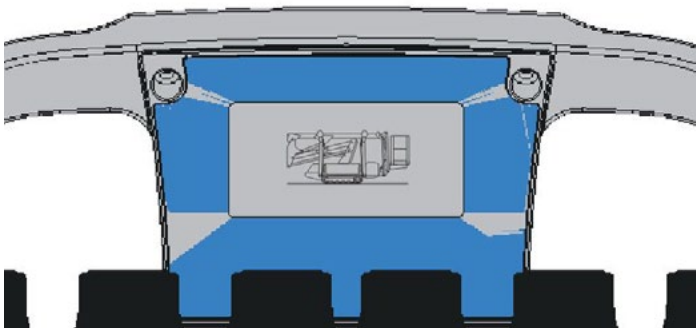
Stato della macchina

Lo stato della macchina è rappresentato dalle seguenti icone

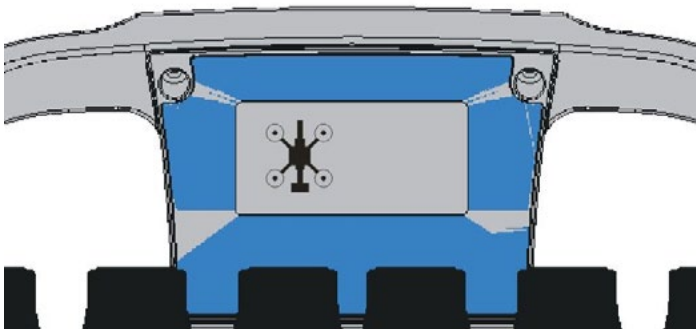
MACCHINA RICOVERATA

La macchina è RICOVERATA quando il braccio distributore è in appoggio sul supporto del carro e nessun stabilizzatore in appoggio.



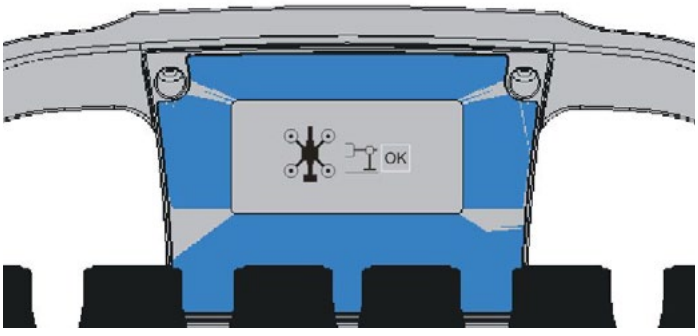
MACCHINA STABILIZZATA RICOVERATA

La macchina è STABILIZZATA RICOVERATA quando tutti e 4 gli stabilizzatori sono in appoggio, la torretta è allineata e il braccio distributore è in appoggio sul supporto del carro.



MACCHINA STABILIZZATA RICOVERATA E LIVELLATA

La macchina è STABILIZZATA RICOVERATA E LIVELLATA quando tutti e 4 gli stabilizzatori sono in appoggio, la macchina è livellata e il braccio distributore è in appoggio sul supporto del carro.



Verificare visivamente l'effettivo livellamento della macchina mediante l'apposita bolla ad aria.

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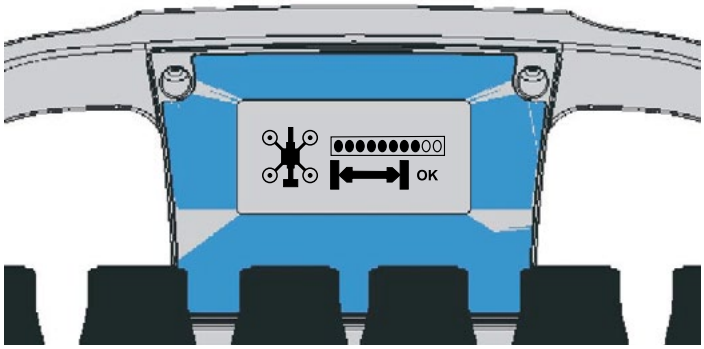
MACCHINA APERTA

La macchina è APERTA quando tutti e 4 gli stabilizzatori sono in appoggio e la macchina non è ricoverata.



Se sul display compare una di queste icone è stato perso l'appoggio di uno o più piedi stabilizzatori.

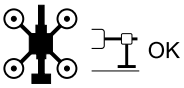
La macchina non è più stabilizzata.

Ripetere la fase di stabilizzazione.

La macchina è STABILIZZATA e NON PIU' RICOVERATA.

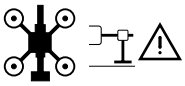
Viene bloccato il movimento degli stabilizzatori.

Alzando il braccio principale si attiva la rotazione della torretta; oltre i 10° rispetto al piano ralla, si attivano i movimenti del secondo e terzo braccio.

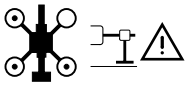


La macchina è STABILIZZATA, LIVELLATA e NON PIU' RICOVERATA.

La macchina È INCLINATA OLTRE 1°.

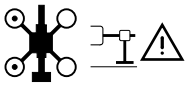


La perdita del livellamento è una condizione non ottimale; tuttavia il sistema elettronico della macchina non impone nessun blocco nei movimenti (fino a massimo 1,5°) poichè si è comunque in sicurezza. È discrezione dell'operatore continuare ad utilizzare la macchina o chiudere la parte aerea e riportare la macchina in stabilità.



La macchina HA PERSO L'APPOGGIO DI UN PIEDE STABILIZZATORE

Il sistema elettronico della macchina non impone nessun blocco nei movimenti poichè si è comunque in sicurezza. È discrezione dell'operatore continuare ad utilizzare la macchina o chiudere la parte aerea e riportare la macchina in stabilità.



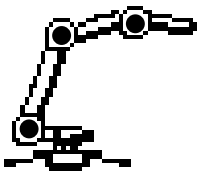
La macchina HA PERSO L'APPOGGIO DI DUE PIEDI STABILIZZATORI

La perdita dell'appoggio di due piedi stabilizzatori è una condizione di pericolo.

I movimenti della parte aerea vengono bloccati ad esclusione di:

- sollevamento braccio principale;
- chiusura secondo braccio;
- chiusura terzo braccio.

MACCHINA CON ABILITAZIONE TRAZIONE A MACCHINA APERTA



La macchina è ABILITATA ALLA TRAZIONE A MACCHINA APERTA quando sono soddisfatti tutti i vincoli citati nel paragrafo '*abilitazione trazione a macchina aperta*'.

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3. UTILIZZO DELLA MACCHINA

Prima di qualsiasi operazione leggere e capire il presente manuale e le istruzioni riportate su targhe e adesivi.

Controlli prima dell'utilizzo

Prima della messa in servizio e di ogni utilizzo, la macchina deve essere controllata come indicato di seguito; inoltre, alla messa in servizio è necessario eseguire la verifica delle sicurezze.

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Assicurarsi che NON vi siano:

- perdite di olio dai tubi o altri componenti idraulici;
- conduttori elettrici tagliati o disinseriti;
- tagli o usura irregolare nei cingoli in gomma;
- danni, deformazioni, viti e bulloni allentati o mancanti, saldature incrinate.

Verificare che:

- il terreno su cui si lavorerà sia duro e capace di supportare il carico massimo trasmesso dal cingolo e dal piattello;
- vi sia la presenza del manuale d'uso e manutenzione;
- vi sia la presenza e la leggibilità di tutte le targhe ed adesivi;
- l'area di lavoro sia sgombra e priva di dislivelli o buche.

Inoltre:

- verificare il livello dell'olio idraulico;
- assicurarsi che nel serbatoio vi sia carburante;
- assicurarsi del corretto tensionamento dei cingoli in gomma;
- accendere prima il pannello di terra e poi la pulsantiera; attendere circa dieci secondi per la fine della sequenza di accensione;
- assicurarsi che non siano segnalati errori sul display della pulsantiera o sugli indicatori luminosi della scatola di terra.

Per periodi di inattività superiori a 7 giorni, effettuare almeno 2 stabilizzazioni complete (far scendere gli stabilizzatori fino al raggiungimento del finecorsa meccanico) prima dell'utilizzo della macchina.

Primo utilizzo

- Si raccomanda di eseguire tutte le operazioni di familiarizzazione con le tubazioni di distribuzione VUOTE.
- Le tubazioni calcestruzzo nuove hanno l'interno rugoso e al primo utilizzo è necessario "rodarle" mediante BOIACCA. Questo al fine di evitare intasamenti di materiale all'interno delle tubazioni stesse.
- Il lavaggio lubrificante con boiacca deve essere eseguito immediatamente prima del pompaggio.

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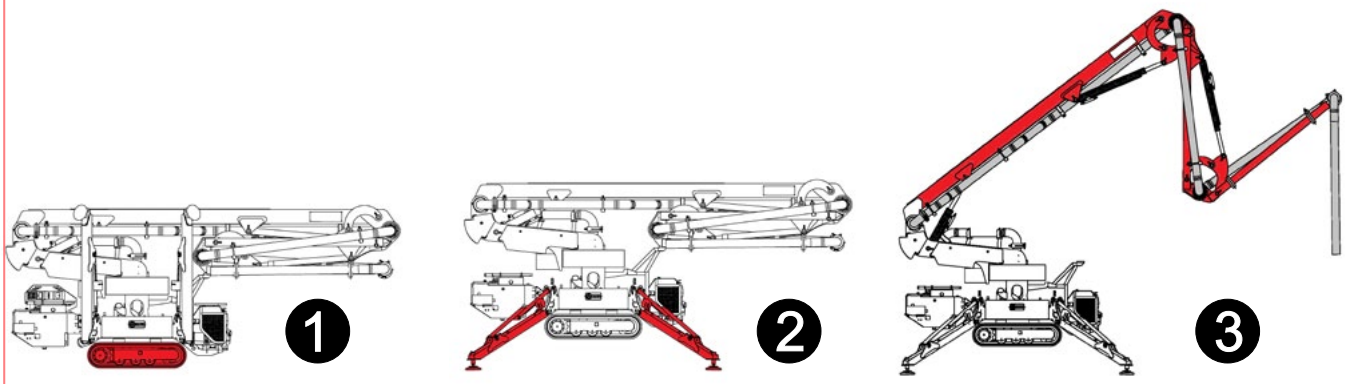
Modalità d'uso

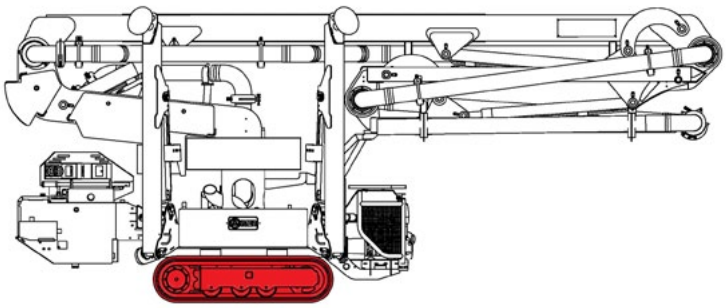
Per operare la distribuzione del calcestruzzo è necessario:

1. portare la macchina in posizione di lavoro mediante trazione e sterzo;
2. stabilizzarla;
3. sollevare il braccio principale e muovere la parte aerea fino al raggiungimento della posizione desiderata (se si intende abilitare la trazione a macchina aperta seguire le indicazioni a pag. 44).

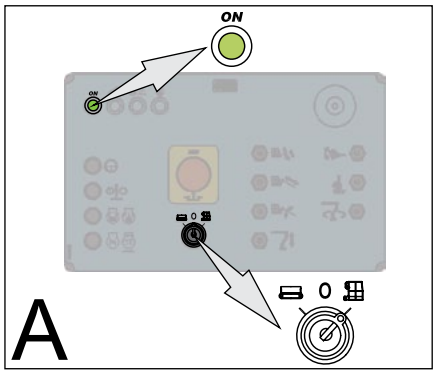


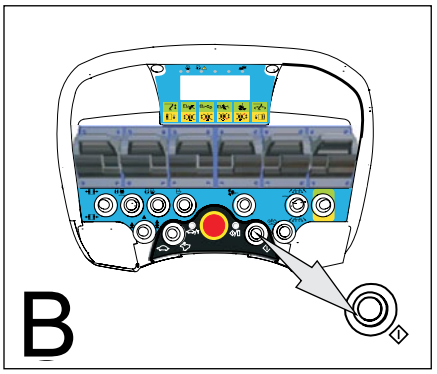
Accertarsi che il pulsante rosso arresto di emergenza non sia premuto sul pannello di terra e sulla pulsantiera.

Portare la macchina in posizione di lavoro



Accendere la macchina





A. Inserire la chiave nel selettore del pannello a terra e ruotarla a destra: si accende la spia ON. Ad ogni accensione le segnalazioni acustiche e luminose (spie e cicalino) si accendono per verificarne l'efficienza. Attendere il loro spegnimento prima di utilizzare la macchina.

B. Accendere la pulsantiera con I1.

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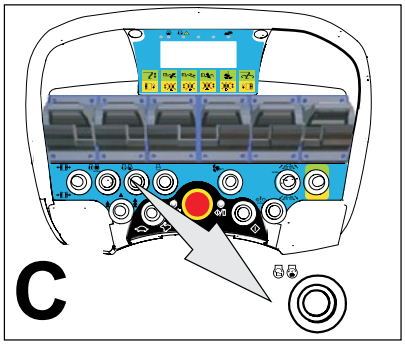
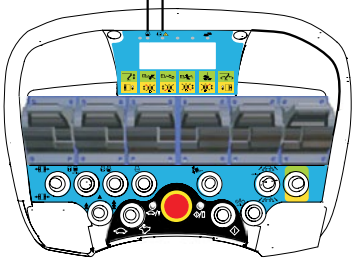
Avviare il motore

C. Avviare il motore endotermico o elettrico con l'interuttore I2.



Se la spia gialla è accesa la tensione di rete è scollegata e si avvia il motore endotermico.

Se la spia verde è accesa la tensione di rete è collegata e si avvia il motore elettrico.
Deve essere attivo il magneto termico differenziale.



Trazione e sterzo

Per fare trazione la macchina deve essere RICOVERATA.

Eseguendo la trazione da terra con pulsantiera mantenere una distanza di almeno 2 metri dalla macchina.

Verificare che l'area di lavoro sia libera da persone, animali ed ostacoli prima di effettuare qualsiasi movimento.

Controllare che sul percorso della macchina non ci siano buche, cunette, dislivelli, ostruzioni, detriti e coperture che possano nascondere buche o altri pericoli.

Dove il terreno lo consente allargare al massimo i cingoli per aumentare la stabilità della macchina.

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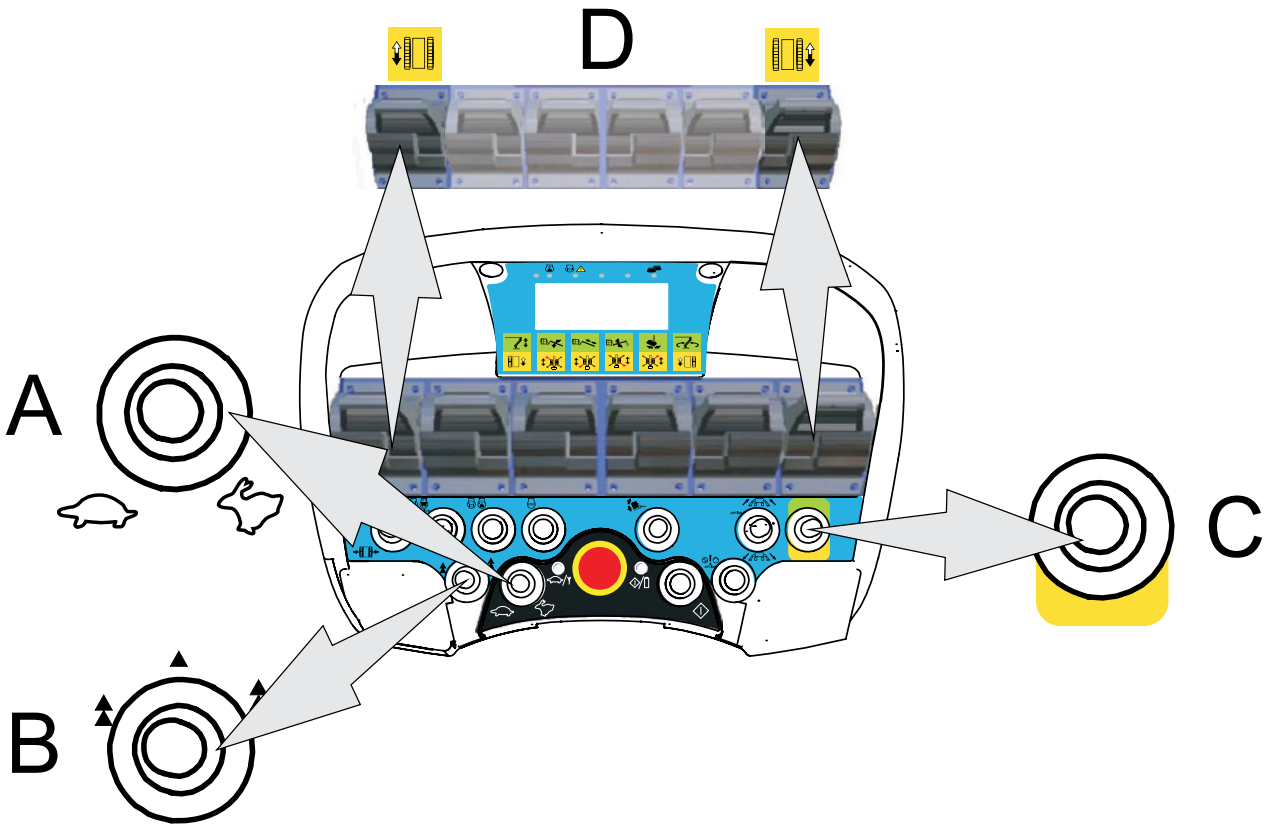


A Con il selettore S3 **impostare la velocità del motore** (se si utilizza il motore endotermico).

B Con il selettore S2 **selezionare la velocità**.

C Portare indietro S6 per **attivare i movimenti di terra.**

D Spostare avanti i due manipolatori dei cingoli M1 – M6.

Se necessario **allargare o chiudere i cingoli** con il selettore S1.

La variazione di carreggiata andrebbe eseguita, possibilmente, contemporaneamente alla trazione.

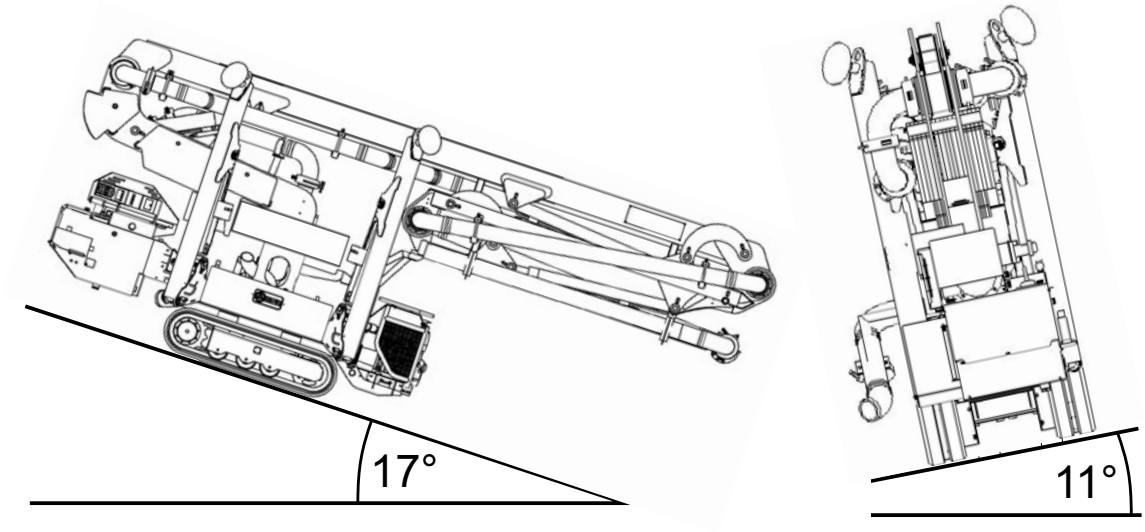
Per eseguire lo sterzo occorre che le velocità dei cingoli siano diverse quindi che **M1 e M6 abbiano inclinazioni diverse**.

- **Sterzo a destra**: dare maggiore inclinazione a **M1.**
- **Sterzo a sinistra**: dare maggiore inclinazione a **M6.**

La velocità ‘LEPRE’ viene inserita in automatico se la proporzionalità dei manipolatori supera il 50%.

Guida su terreni inclinati

- Non guidare la macchina in salita o discesa su terreni con pendenza superiore ai 17° (30%).
- Nella guida su pendenze laterali allargare al massimo i cingoli per aumentare la stabilità e abbassare gli stabilizzatori a valle fino a porli in prossimità del terreno. Non guidare la macchina su pendenze laterali che superino gli 11° (19%).



Durante la trazione l'inclinazione del carro è continuamente tenuta sotto controllo e si attivano un preallarme ed un allarme nel caso si raggiungano soglie limite di sicurezza.

Preallarme

Se l'inclinazione del carro supera 10° longitudinali e/o 6° trasversali scatta un preallarme costituito da:

- allarme acustico intermittente con frequenza elevata;
- allarme luminoso: la spia arancione L3 sulla pulsantiera si attiva con la stessa frequenza dell'allarme sonoro;
- la velocità di trazione della macchina viene automaticamente ridotta.

Allarme

Se l'inclinazione del carro supera 17° longitudinali e/o 11° trasversali scatta un allarme costituito da:

- allarme acustico intermittente con frequenza bassa;
- allarme luminoso: la spia arancione L3 sulla pulsantiera si attiva con la stessa frequenza dell'allarme sonoro;
- la trazione della macchina viene automaticamente bloccata.

Override

In caso di allarme con blocco della trazione, l'operatore può bypassare l'allarme per un tempo limitato così da far uscire la macchina dalla situazione di inclinazione eccessiva.
Per attivare questa funzione premere per 5 secondi il tasto di accensione della macchina.
Il cambio di segnalazione acustica e visiva informa il passaggio dalla situazione di allarme alla situazione di preallarme descritta in precedenza.
A questo punto si hanno a disposizione 30 secondi per manovrare a velocità ridotta e uscire dalla configurazione di eccessiva inclinazione.

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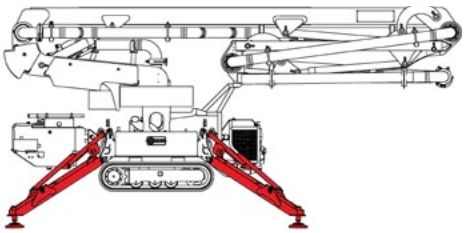
Stabilizzare la macchina

Collocata la macchina si procede con la stabilizzazione ed il livellamento.



Il movimento degli stabilizzatori è possibile solo con macchina RICOVERATA.

Il livellamento automatico è soltanto un aiuto elettronico che aumenta notevolmente la facilità d'uso della macchina. La semplicità d'impiego non deve far trascurare le raccomandazioni di seguito riportate.

Prima di procedere con le operazioni di stabilizzazione accertarsi che non vi siano persone nel raggio d'azione dei piattelli dei cilindri stabilizzatori.

Prima di iniziare l'operazione di stabilizzazione accertarsi che il terreno sotto gli stabilizzatori sia orizzontale (senza sconnessioni o buche), con buona aderenza e sia in grado di sopportare il carico massimo trasmesso al suolo dagli stabilizzatori, riportato dalle targhe applicate sulla macchina.

Se necessario, posizionare delle robuste piastre di ripartizione del peso sotto i piattelli degli stabilizzatori.

Controllare che gli stabilizzatori non vengano ad appoggiare su tombini o tubature.

La stabilizzazione sarà conclusa quando la macchina sarà posta in posizione orizzontale con tolleranza inferiore a 1°.

Stabilizzare la macchina con un grado di inclinazione superiore a quello ammesso può renderla instabile e causare gravi danni a cose e persone.
È assolutamente obbligatorio lavorare con la macchina stabilizzata con inclinazione inferiore al limite ammesso dal costruttore.

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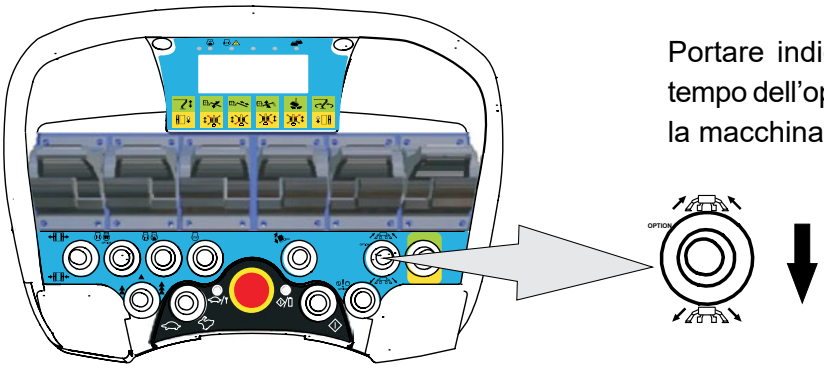
Stabilizzazione automatica



Portare indietro **S5** e tenerlo premuto per tutto il tempo dell'operazione: gli stabilizzatori si abbassano, la macchina viene stabilizzata e livellata.

Quando sul display della pulsantiera compare l'icona OK il livellamento è stato raggiunto e il movimento automaticamente si interrompe.

- Riportare il selettore in posizione neutra.
- Volendo alzare ulteriormente il carro da terra eseguire un'altra stabilizzazione automatica.
- Verificare sempre visivamente l'effettivo livellamento della macchina mediante l'apposita bolla ad aria.

Al termine della stabilizzazione automatica vengono disabilitati i manipolatori manuali del movimento dei piedi.

Con il braccio distributore in sede di ricovero

- Se la macchina si inclina oltre 1° l'icona sul display diventa segnalando la perdita del livellamento.
- Se viene perso l'appoggio di uno o più piedi stabilizzatori i movimenti della parte aerea vengono bloccati.

In entrambi i casi ripetere la fase di stabilizzazione.

Con parte aerea aperta

- Se la macchina si inclina oltre 1° l'icona sul display diventa segnalando il il pericolo di ribaltamento.
- Se viene perso l'appoggio di un piede stabilizzatore l'icona sul display diventa : sono consentiti i movimenti della parte aerea di rientro e non destabilizzanti.
- Se viene perso l'appoggio di due piedi stabilizzatori l'icona sul display diventa : i movimenti della parte aerea vengono bloccati ad esclusione dei movimenti che favoriscono il ritorno in condizioni di appoggio di almeno 3 piedi stabilizzatori:
  - sollevamento braccio principale;
  - chiusura secondo braccio;
  - chiusura terzo braccio.

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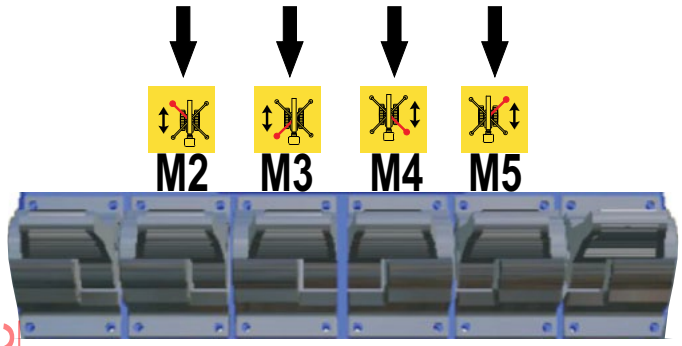
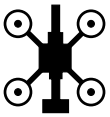
Stabilizzazione manuale



Portare indietro i 4 manipolatori **M2 – M3 – M4 – M5** per stabilizzare la macchina.

Sul display della pulsantiera deve comparire l'icona:



Un piede che appoggia il terreno non può più essere abbassato fino a quando tutti e quattro i piedi sono appoggiati.

Terminata la stabilizzazione:

- verificare che i **cingoli siano sollevati dal terreno**;
- ispezionare visivamente l'effettivo **appoggio dei cilindri**;
- verificare visivamente l'**effettivo livellamento della macchina** mediante l'apposita bolla ad aria.

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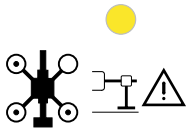
Controllo inclinazione carro

Terminata la stabilizzazione si può sollevare la parte aerea ed iniziare il lavoro.

Durante il lavoro l'inclinazione del carro è continuamente tenuta sotto controllo e si attivano un preallarme ed un allarme nel caso si raggiungano soglie limite di sicurezza.

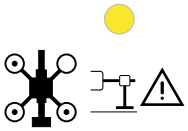
Preallarme



Se l'inclinazione del carro supera 1,2° si attiva un preallarme costituito da:

- allarme acustico intermittente con frequenza elevata;
- allarme luminoso: la spia arancione L3 sulla pulsantiera si attiva con una sequenza di tre lampeggi: breve - lungo - breve;
- compare l'icona di allarme stabilizzazione;
- tutti i movimenti sono consentiti ma la loro velocità viene automaticamente ridotta.

Allarme



Se l'inclinazione del carro supera 1,5° si attiva un allarme costituito da:

- allarme acustico intermittente con bassa frequenza;
- allarme luminoso: la spia arancione L3 sulla pulsantiera si attiva con una sequenza di un lampeggio lungo e una pausa;
- compare l'icona di allarme stabilizzazione;
- i movimenti della parte aerea vengono bloccati ad esclusione dei movimenti che favoriscono il ritorno in condizioni di preallarme:
  - sollevamento braccio principale;
  - chiusura secondo braccio;
  - chiusura terzo braccio.

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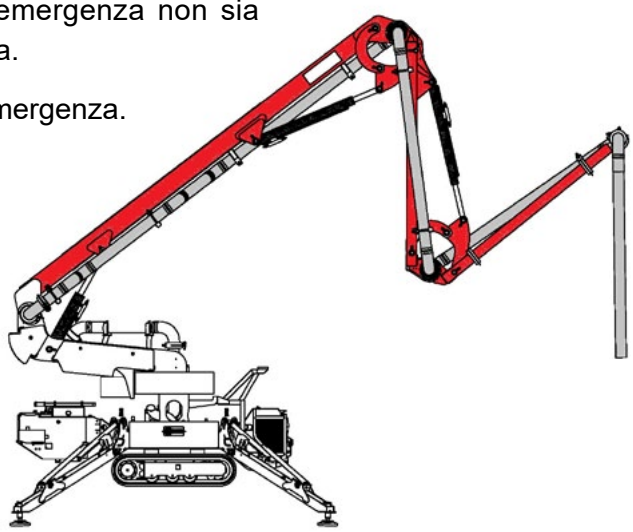
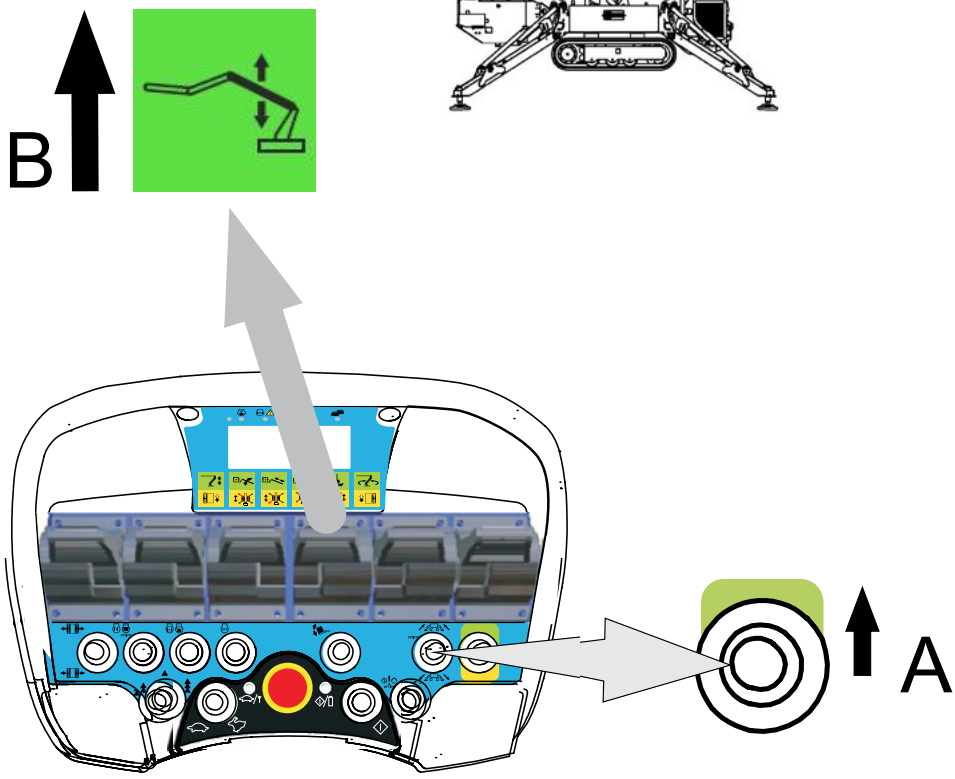
Muovere la parte aerea

- Accertarsi che il pulsante rosso arresto di emergenza non sia premuto sul pannello a terra e sulla pulsantiera.
- Verificare sempre la situazione delle spie di emergenza.





A Spostare avanti **S5.**

B Sollevare il braccio principale spostando avanti il manipolatore **M4.**

Alzando il braccio principale si attivano i movimenti della torretta comandati dal manipolatore **M5.**

Alzando il braccio principale oltre 10° si attivano i movimenti della parte aerea comandati dai manipolatori **M2** e **M3**.

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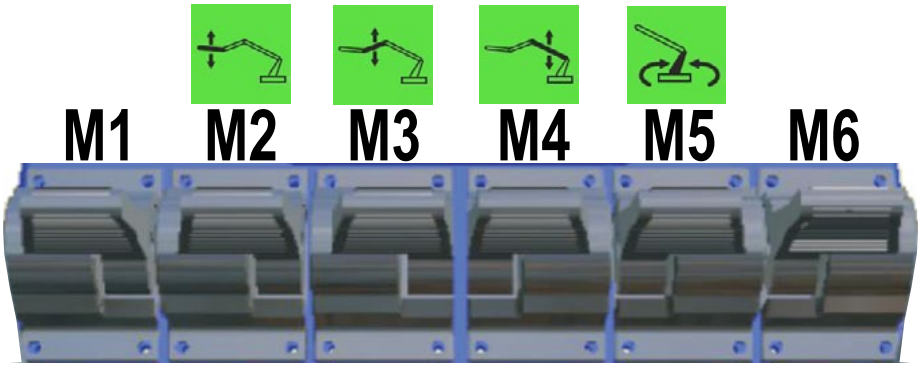

MANIPOLATORE		MOVIMENTO AEREO
M2 TERZO BRACCIO	Avanti	Chiusura
	Indietro	Apertura
M3 SECONDO BRACCIO	Avanti	Apertura
	Indietro	Chiusura
M4 BRACCIO PRINCIPALE	Avanti	Salita
	Indietro	Discesa
M5 ROTAZIONE TORRETTA	Avanti	Senso orario
	Indietro	Senso antiorario

I movimenti della torretta si abilitano nel momento in cui il braccio distributore si stacca dal supporto posto sul carro (disabilitando il micro magnetico di ricovero).

I movimenti del secondo e del terzo braccio si abilitano solo con il braccio principale alzato di 10° rispetto al piano ralla.

Accertarsi che il tubo terminale in gomma sia libero da ogni impedimento e che non si impigli durante l'apertura e la chiusura del braccio.

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Movimenti aerei contemporanei

Quando si eseguono movimenti aerei in contemporanea la macchina viene automaticamente accelerata.

I movimenti di due bracci e della torretta possono essere azionati nelle varie combinazioni di salita/discesa e uscita/rientro in contemporanea.

I movimenti aerei singoli vengono eseguiti in automatico dalla macchina al minimo regime del motore senza perdità di performance.

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Abilitare la trazione a macchina aperta

- Per l'abilitazione e le funzioni della trazione a macchina aperta riferirsi al paragrafo relativo a pagina 44.

I movimenti aerei non sono consentiti se è abilitata la trazione a macchina aperta.

Utilizzo del braccio distributore - raccomandazioni

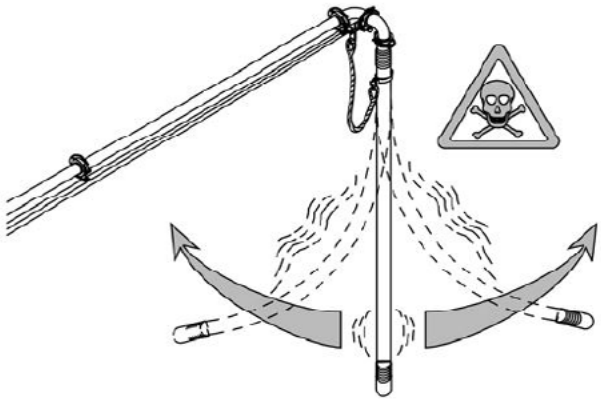
Prima di eseguire qualsiasi azionamento, l'operatore deve accertarsi che non sussistano pericoli per la propria o altrui persona.

È vietato manovrare o trattenere il tubo terminale in gomma.

Non sostare nel raggio d'azione del tubo terminale in gomma.

Sblocchi improvvisi di eventuali intasamenti nella tubazione, possono trasmettere violenti colpi di frusta.

Prestare attenzione all'oscillazione verticale del braccio, causato del pompaggio del calcestruzzo nelle tubazioni.



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Ritorno in macchina ricoverata

Terminati i lavori riportare la macchina nella stato di macchina ricoverata.

Se è abilitata la trazione a macchina aperta, tornare allo stato di MACCHINA APERTA operando la discesa degli stabilizzatori.

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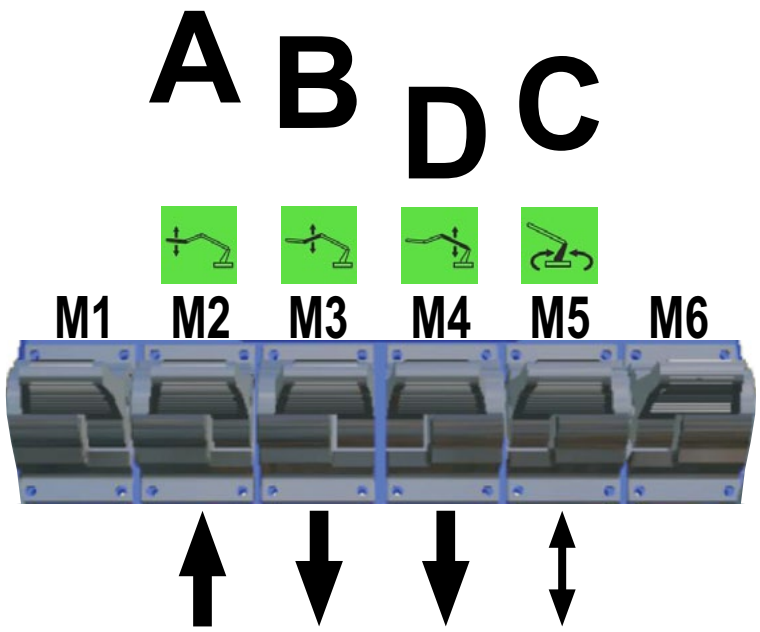
Rientro parte aerea



A Rientrare completamente con il terzo braccio portando **M2 avanti**.

B Rientrare completamente con il secondo braccio portando **M3 indietro**.

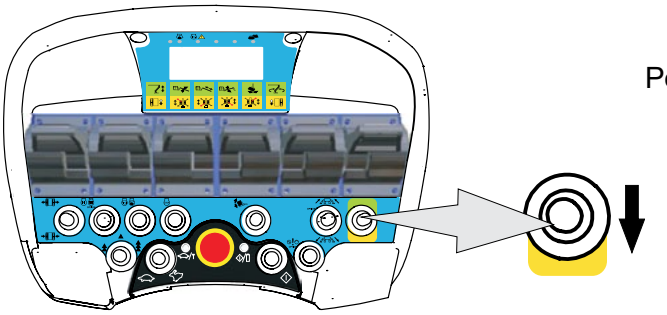
C Ruotare la torretta con **M5** fin tanto che non sia perfettamente in asse con il carro.

D Chiudere completamente il braccio principale portando **M4** indietro.

I movimenti del secondo e del terzo braccio si abilitano solo con il braccio principale alzato di 10° rispetto al piano ralla.

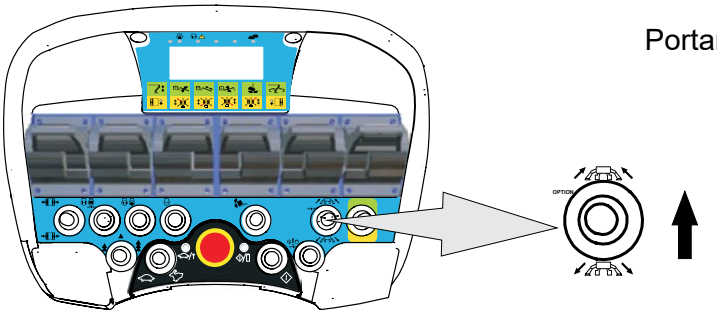
Rientro stabilizzatori

Il rientro degli stabilizzatori è abilitato solo con il braccio distributore in sede di ricovero.



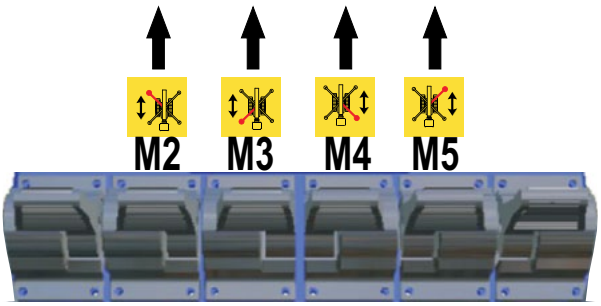
Portare indietro **S6** per **attivare i movimenti di terra**.

Procedura automatica



Portare avanti **S5** fino all'interruzione del movimento.

Procedura manuale



Portare avanti i 4 manipolatori M2 – M3 – M4 – M5 per far salire i piedi.

In questa fase non vi è nessun controllo sulla sequenza di movimento degli stabilizzatori, prestare molta attenzione cercando di abbassare la macchina mantenendola sempre il più livellata possibile.

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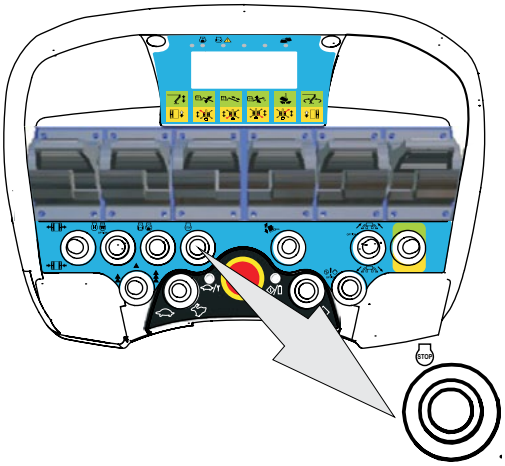
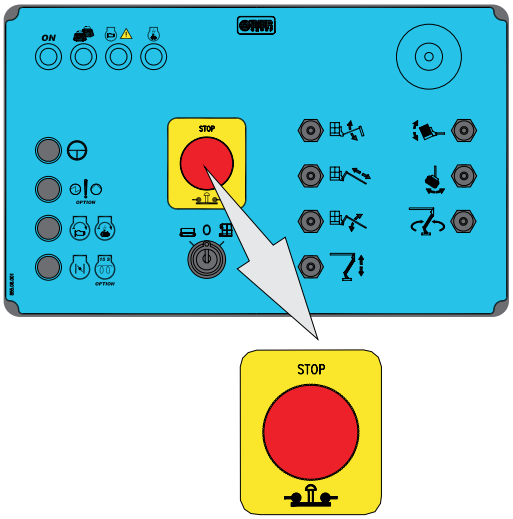
Spegnere il motore



Da pulsantiera

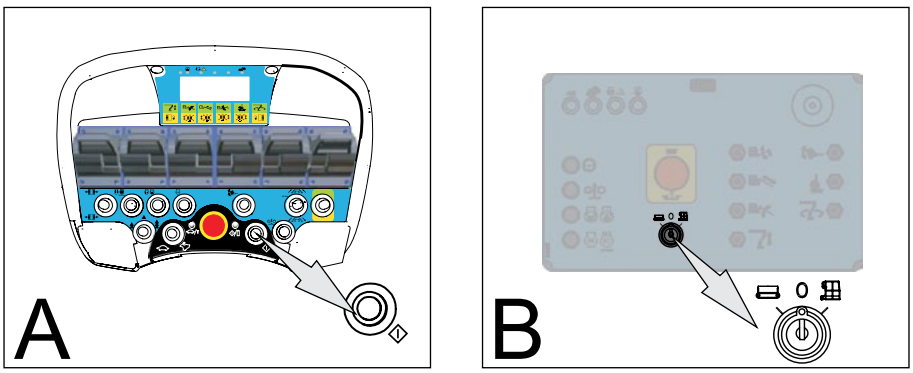
- Spegnere il motore endotermico con l'interruttore I4.



Da scatola comandi a terra

- Premere il pulsante di emergenza 2.

Spegnere la macchina



A . Spegnere la pulsantiera con l'interuttore I1.

B . Riportare in posizione centrale la chiave nella scatola comandi a terra.

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Operazioni di fine pompaggio e pulizia

Le operazioni di pulizia non devono arrecare alcun danno all'ambiente.

Il calcestruzzo residuo e tutti i materiali derivanti dal lavaggio dell'intera attrezzatura, devono essere gestiti rispettando le normative vigenti.

Dopo ogni ciclo di pompaggio è indispensabile procedere ad una accurata pulizia della tubazione, al fine di prevenire incrostazioni di calcestruzzo che potrebbero dare origine a frequenti intasamenti all'interno della tubazione stessa.

Fine lavori

- Estrarre sempre la chiave dal selettore.

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Procedure di emergenza

Movimenti manuali d'emergenza

Se la macchina si blocca a causa di un guasto meccanico o elettrico, è possibile intervenire riportandola nella configurazione di trasporto.

Nella **configurazione standard** della macchina la procedura d'emergenza prevede l'utilizzo delle elettrovalvole dei blocchi idraulici presenti sulla macchina e i movimenti vengono eseguiti mediante pompa manuale posizionata sul fianco del serbatoio.

Se sulla macchina è installata l'**elettropompa 12 V optional** i movimenti vengono eseguiti elettricamente.

Le procedure di emergenza con l'utilizzo dell'elettropompa 12 V sono due in base al tipo di problema:

- macchina bloccata senza segnalazioni di allarme;
- macchina bloccata in allarme.

La procedura da seguire quando la macchina è bloccata in allarme è la medesima utilizzata per la configurazione standard con pompa manuale.

L'elettropompa 12 V è collegata alla batteria di avviamento. L'uso prolungato ne determina una rapida scarica.

Prima di eseguire i movimenti di emergenza è indispensabile accertarsi dell'assenza di ostacoli.

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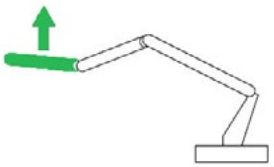
Procedura discesa manuale di emergenza

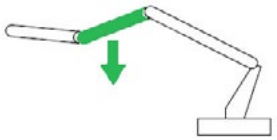
Quando è necessario utilizzare la pompa manuale per portare in sicurezza e chiudere la macchina, è raccomandato attenersi alla seguente procedura così da evitare movimenti destabilizzanti, prevenire una situazione maggiormente pericolosa e non incappare in interferenze tra il braccio distributore ed il carro.

Se è abilitata la trazione a macchina aperta, eseguire innanzitutto la discesa degli stabilizzatori finchè tutti e quattro siano ben appoggiati al terreno.

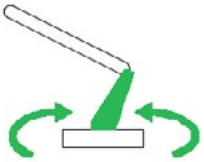
Fase 1: CHIUSURA del terzo braccio.



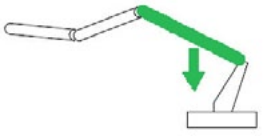
Fase 2: CHIUSURA del secondo braccio.



Fase 3: ALLINEAMENTO della torretta con il carro.



Fase 4: DISCESA del braccio principale.



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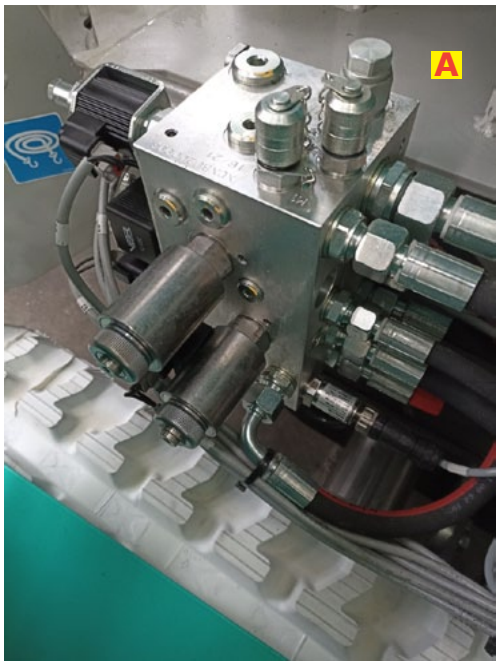
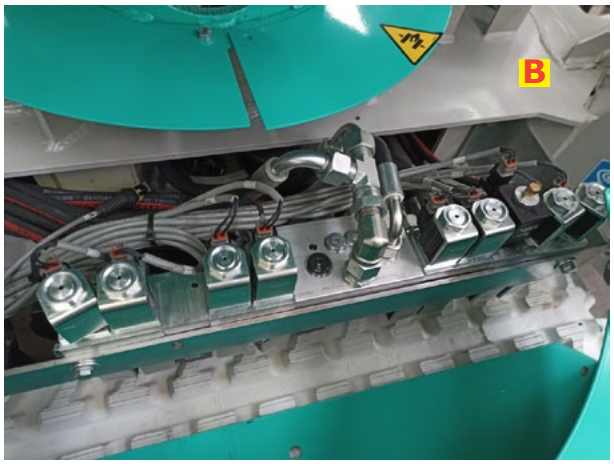
Con pompa manuale

Il blocco principale si trova nel box destro (A); i blocchi per le movimentazioni si trovano nel box sinistro (B) e sul lato anteriore della torretta (C).

La pompa manuale è posizionata sul lato sinistro del serbatoio.





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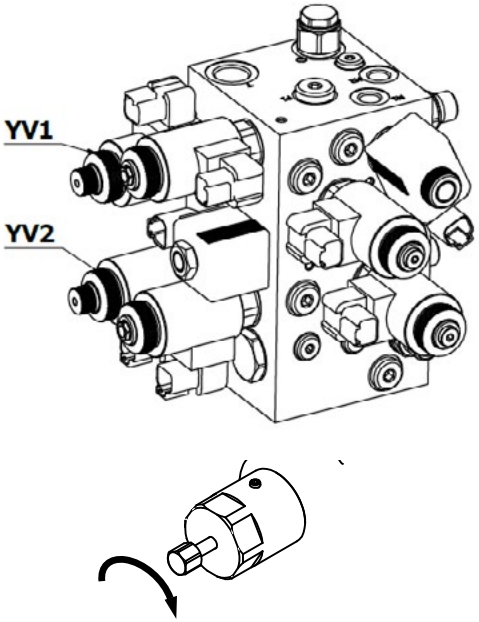
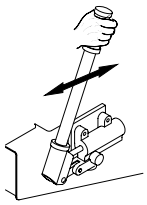
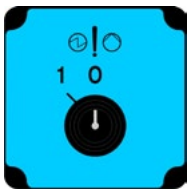
Per eseguire un movimento manualmente:

1. individuare le elettrovalvole YV1 e YV2 sul blocco principale A;
2. avvitare senza forzare il nottolino delle elettrovalvole fino a fine corsa;
3. individuare la valvola del movimento richiesto;
4. svitare la ghiera della bobina ed avvitare il nottolino d'emergenza per l'apertura del cassetto della valvola;
5. avvitare senza forzare il nottolino;



6. per eseguire il movimento azionare la pompa manuale con l'apposita leva oppure, se presente, azionare l'elettropompa 12 V girando l'interruttore di avviamento sulla posizione 1 mantenendolo fino al completamento del movimento.





L'interruttore di avviamento dell'elettropompa 12 V si trova nel box destro.

Al termine dell'operazione assicurarsi di aver riportato le elettrovalvole di emergenza all'impostazione iniziale come indicato di seguito.

Nel BLOCCO PRINCIPALE A:

1. svitare completamente la vite delle valvole YV1 e YV2.

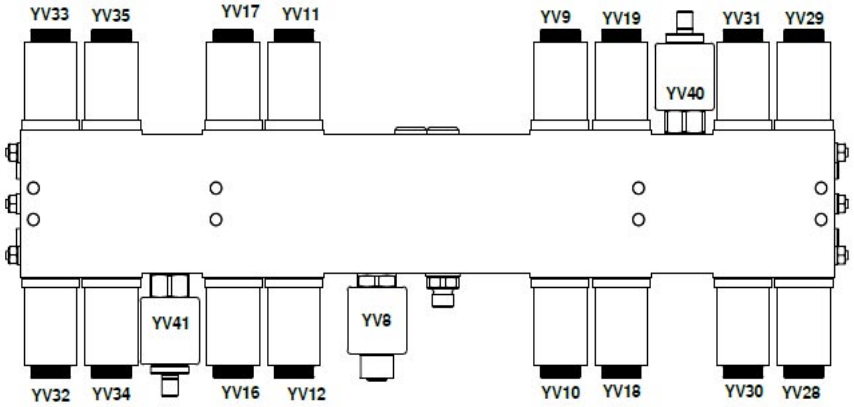
Nei BLOCCHI B-C:

2. svitare senza forzare il nottolino dell'elettrovalvola fino a fine corsa.

Blocchi idraulici

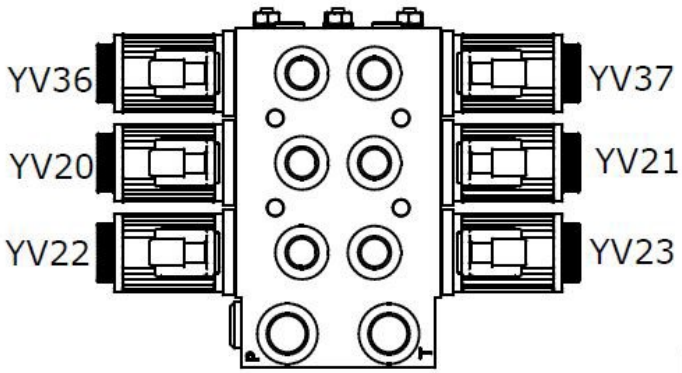
B

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



C

YV21	
YV20	
YV23	
YV22	
YV37	
YV36	



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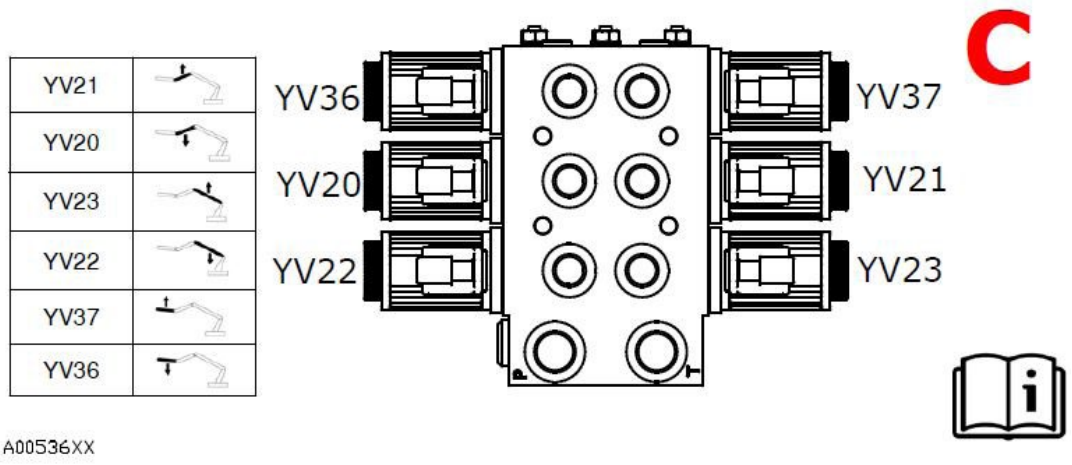
Esempio 1

Si rende necessario eseguire la **discesa del braccio principale**:

1. il movimento è associato all'elettrovalvola YV22 del blocco C;
2. avvitare le valvole YV1 e YV2 del Blocco A;
3. svitare il dado di protezione dell'elettrovalvola YV22 del Blocco C;
4. avvitare senza forzare il nottolino d'emergenza fino a fine corsa;
5. azionare la pompa manuale con l'apposita leva fino al completo abbassamento del braccio o, se presente, azionare l'elettropompa 12 V girando l'interruttore di avviamento sulla posizione 1 mantenendolo fino al completamento del movimento;
6. svitare senza forzare il nottolino d'emergenza dall'elettrovalvola YV22;
7. avvitare il dado di protezione dell'elettrovalvola YV22;
8. svitare le valvole YV1 e YV2 del Blocco A.



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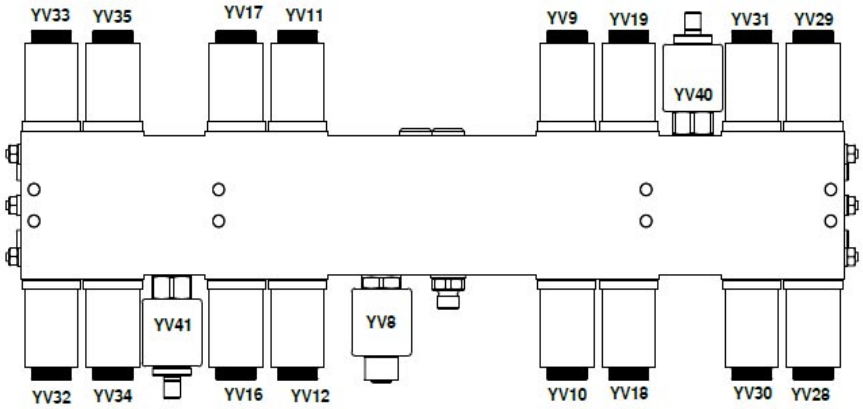
Esempio 2

Si rende necessario eseguire la **discesa dello stabilizzatore posteriore sinistro**:

1. il movimento è associato alle elettrovalvole YV29 e YV40 del Blocco B;
2. avvitare le valvole YV1 e YV2 del Blocco A;
3. svitare l'elettrovalvola YV40 del Blocco B;
4. svitare il dado di protezione dell'elettrovalvola YV29 del Blocco B;
5. avvitare senza forzare il nottolino d'emergenza fino a fine corsa;
6. azionare la pompa manuale con l'apposita leva fino al completo abbassamento dello stabilizzatore o, se presente, azionare l'elettropompa 12 V girando l'interruttore di avviamento sulla posizione 1 mantenendolo fino al completamento del movimento;
7. svitare senza forzare il nottolino d'emergenza dall'elettrovalvola YV29;
8. avvitare il dado di protezione dell'elettrovalvola YV29;
9. svitare l'elettrovalvola YV40;
10. svitare le elettrovalvole YV1 e YV2.

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



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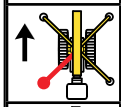
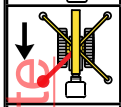
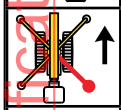
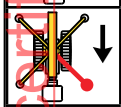
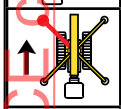
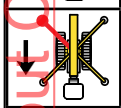
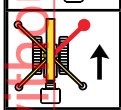
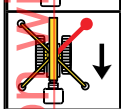
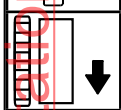
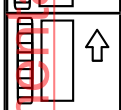
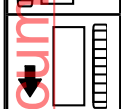
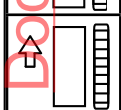
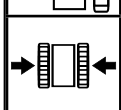
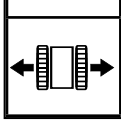
In questa pagina e nella successiva sono presenti 2 tabelle che riepilogano elettrovalvole e movimenti. Chiudere sempre le elettrovalvole YV1 e YV2 prima di effettuare il movimento di emergenza e svitarle al termine.

	B-YV40	B-YV28	B-YV29	B-YV30	B-YV31	B-YV41	B-YV32	B-YV33	B-YV34	B-YV35	B-YV9	B-YV10	B-YV11	B-YV12	B-YV16	B-YV17
	X	X														
	X		X													
	X			X												
	X				X											
						X	X									
						X		X								
						X			X							
						X				X						
											X					
												X				
													X			
														X		
															X	
																X

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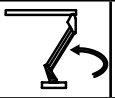
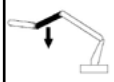
		X						
			X					
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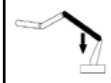					X			
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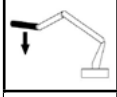
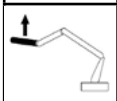
							X	
								X

Procedura con macchina bloccata senza segnalazioni di allarme - Con elettropompa 12 V (optional)

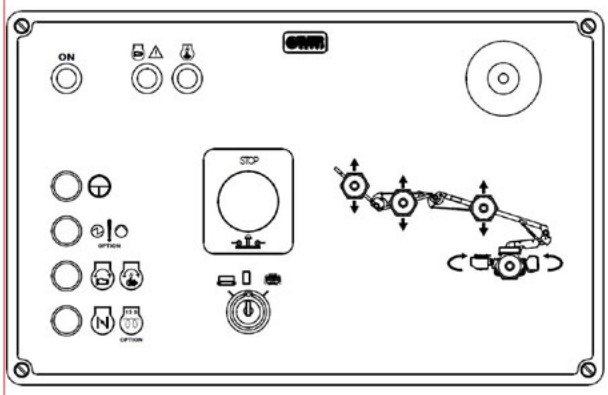
L'elettropompa 12 V è collegata alla batteria avviamento: l'uso prolungato ne determina una rapida scarica.

Assicurarsi che la macchina non sia collegata alla rete 230 V o che il magneto termico differenziale sia disattivato.

La pulsantiera deve essere accesa.

Da pannello a terra

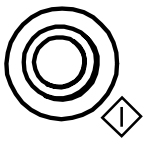
Eseguire le seguenti operazioni dal pannello comandi a terra:



1. girare a sinistra la chiave nel selettore;
2. premere il pulsante per accendere l'elettropompa 12 V;
3. tenere premuto il pulsante uomo presente e contemporaneamente muovere il selettore del movimento che si desidera compiere.

Da pulsantiera

1. Dal pannello comandi a terra girare a destra la chiave nel selettore;
2. accendere la pulsantiera con I1;



3. premere l'interruttore I6 per accendere l'elettropompa 12 V;
4. muovere il manipolatore del movimento che si desidera compiere.

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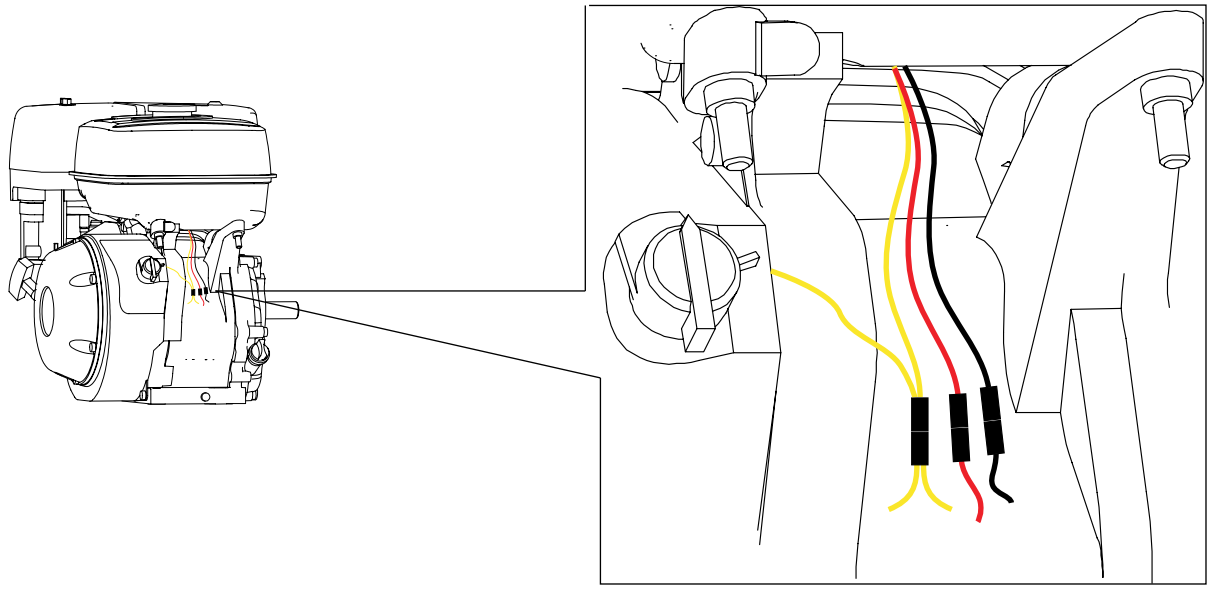
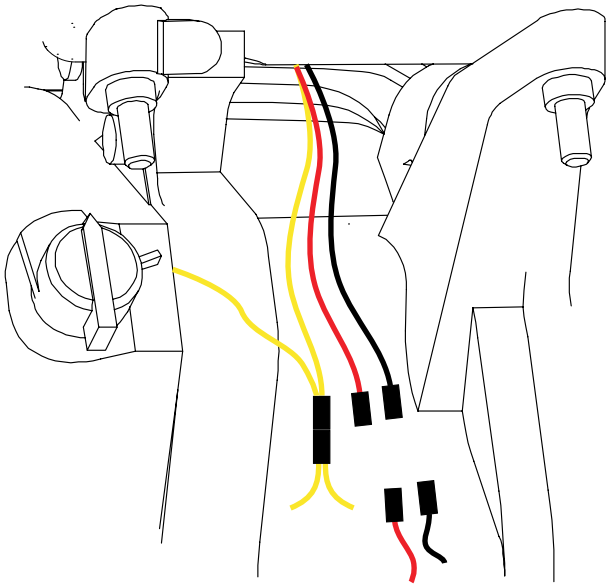
Avviamento manuale motore endotermico

Motore benzina

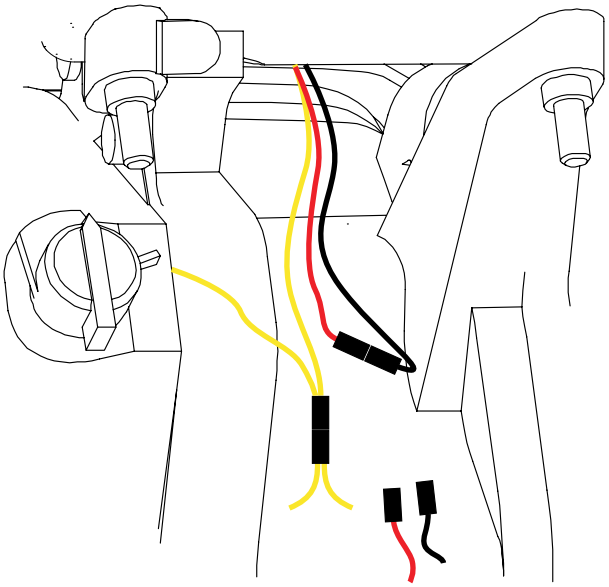
1. Sul lato destro del motore individuare i 4 fili indicati in figura (2 gialli - 1 rosso - 1 nero).



2. Staccare dai rispettivi connettori i fili rosso e nero.



3. Collegare i 2 terminali.



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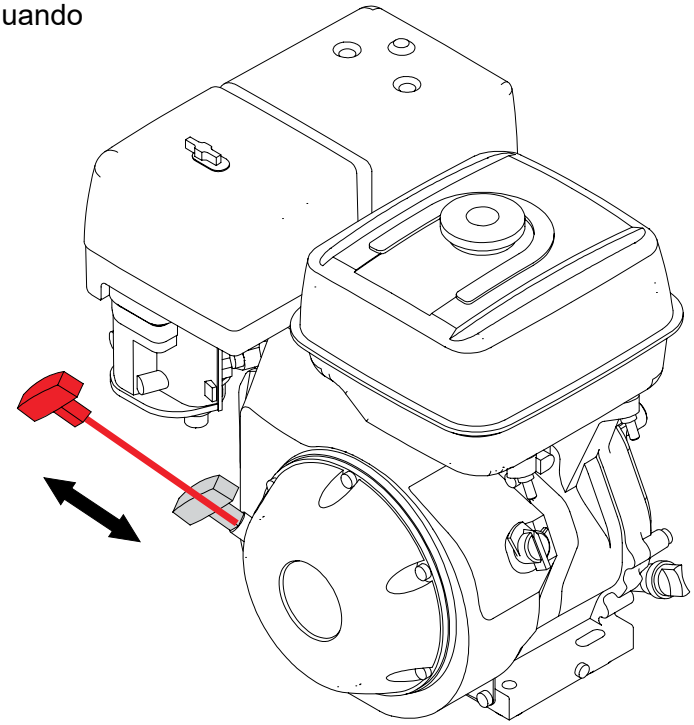
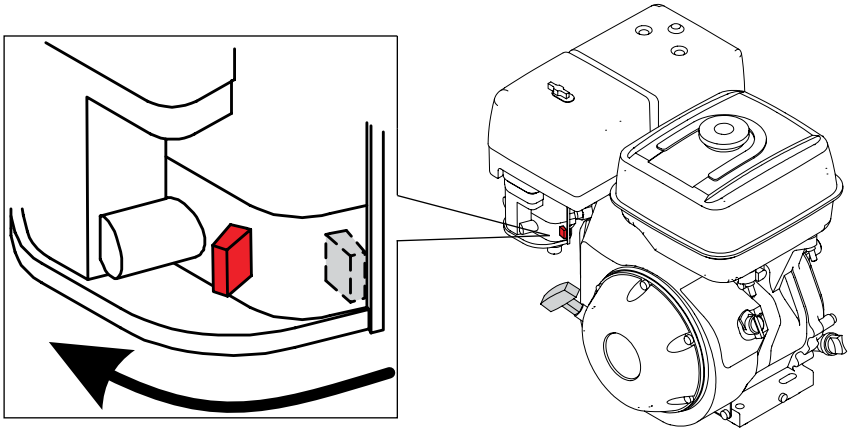
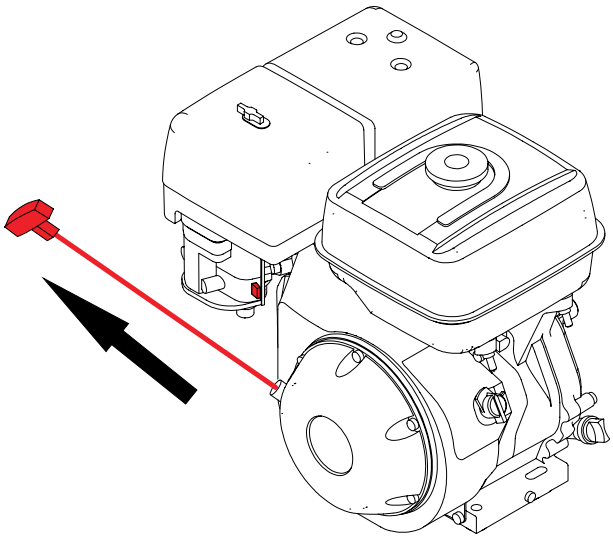
4. Tirare la leva dell'accensione motore fino a quando oppone resistenza e rilasciarla.



5. Tirare la leva dell'aria verso l'esterno.



6. Tirare la leva con decisione.



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Ricarica della batteria

L'icona sul display della pulsantiera, oltre a segnalare l'anomalia dell'alternatore (accesa fissa), indica lo stato della batteria di accensione.

- Accesa lampeggiante: la batteria d'accensione è sotto il livello di guardia ed occorre ricaricarla.

Per la ricarica occorre collegare la macchina alla rete 220 V e attivare il magnetotermico dell'elettropompa-caricabatteria.

Il caricabatterie accenderà una spia verde mentre sta effettuando la carica della batterie e una spia rossa quando avrà raggiunto la carica completa.

Caratteristiche raddrizzatore linea 220 V

- Caricatore 12 V 12 A
- Alimentazione 185/265 V – 47/62 Hz
- Temperatura di funzionamento da -10°C a +40°C
- Curva di carica IUoU
- Protezione contro il cortocircuito in uscita
- Protezione contro inversione di polarità
- Peso 1.3 kg

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Trasporto

Accertarsi che il mezzo utilizzato per il trasporto e/o il sollevamento supporti la massa della macchina.

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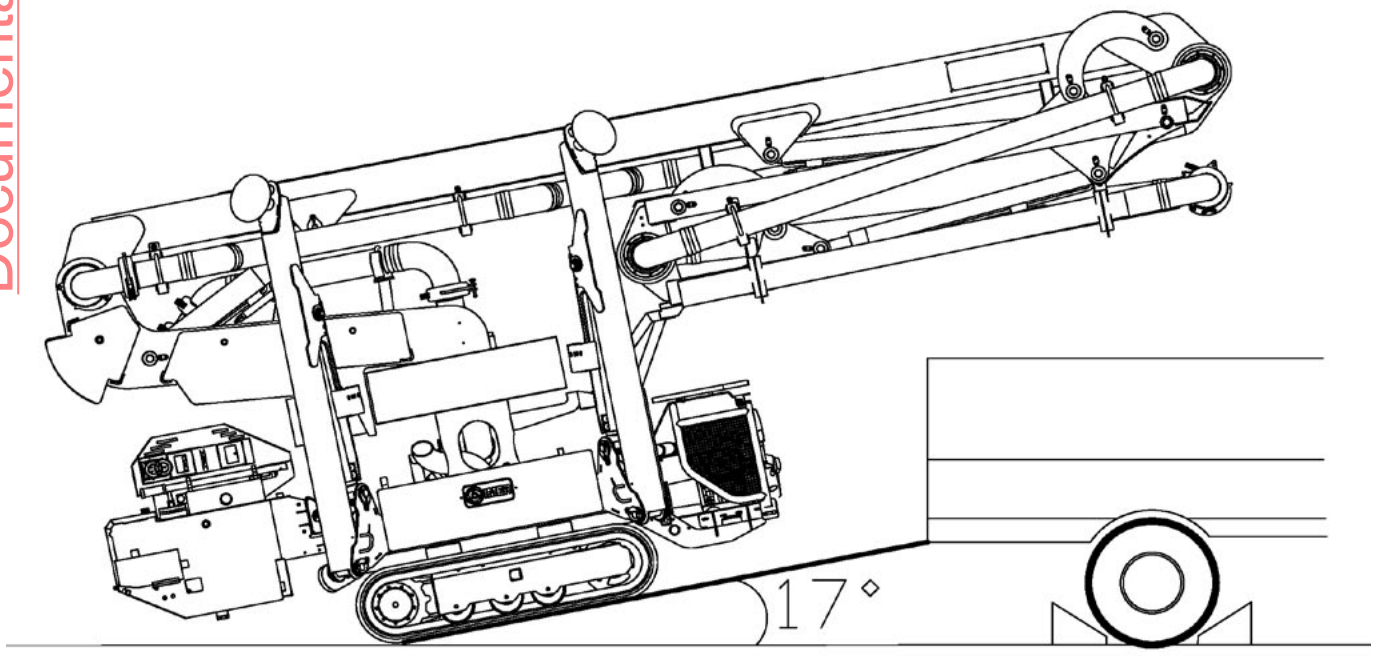
Carico scarico della macchina

Il carico e scarico della macchina sul pianale del mezzo di trasporto può avvernire:

- con l'utilizzo di rampe;
- mediante sollevamento.

Con l'utilizzo di rampe

- Parcheggiare il mezzo di trasporto su superficie piana.
- Posizionare le rampe parallele fra loro, ad una distanza pari a quella dei cingoli e con una inclinazione che non superi i 17°.
- Eseguire sempre le operazioni di carico scarico mantenendo la distanza di sicurezza.
- Procedere con cautela, alla velocità minima per evitare sobbalzi della macchina.
- Collocare la macchina in modo che nessuna sua parte fuoriesca dall'area del pianale.



Mediante sollevamento

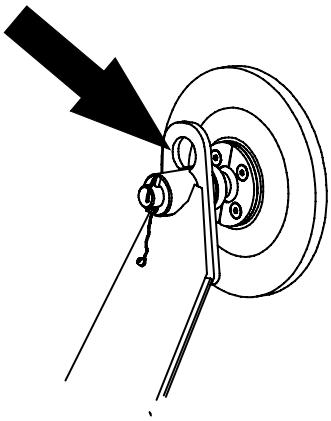
Il sollevamento va eseguito con gru o carri ponte.

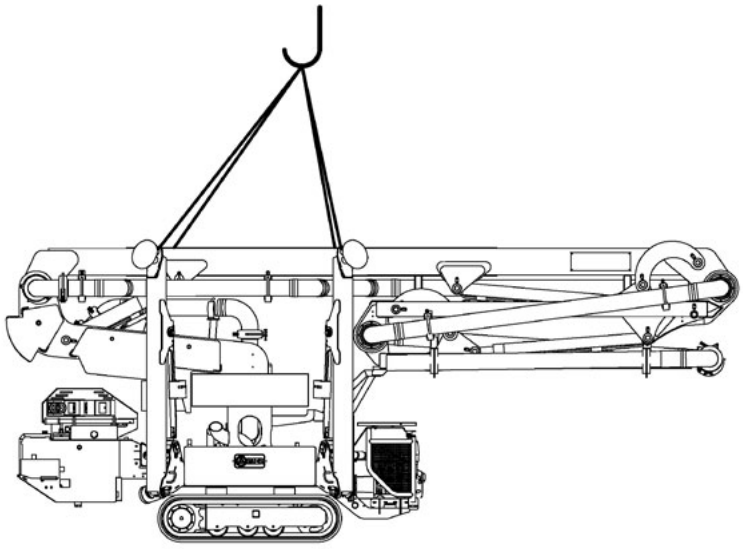
Utilizzo di gru o carri ponte

Utilizzare fasce, catene e ganci in perfetto stato di conservazione.

- Sollevare la macchina solo quando si trova in posizione ricoverata.
- L'area interessata al sollevamento deve essere sgombra.
- Non transitare con macchina sospesa sopra le persone.

Agganciare la macchina con funi o catene passanti attraverso i 4 punti di attacco indicati da appositi adesivi.





Non imbragare la macchina in modo diverso da come illustrato, ciò può provocare danni strutturali.

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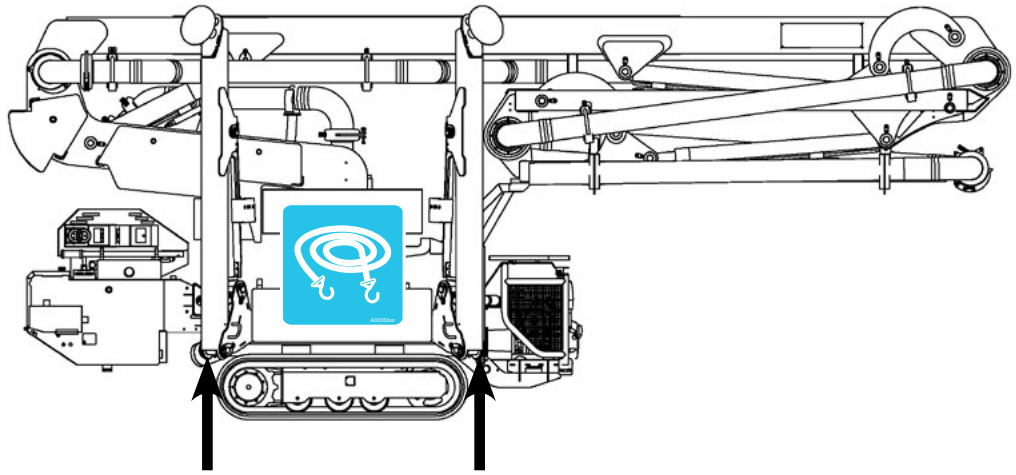
Fissaggio della macchina

Per il trasporto assicurare la macchina al piano dell'automezzo con fasce passanti attraverso i 4 punti di attacco, 2 anteriori e 2 posteriori, indicati da appositi adesivi.



Non assicurare la macchina a punti diversi da quelli indicati dagli adesivi.

È vietato far funzionare la macchina quando si trova posizionata sul pianale del mezzo di trasporto.

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Immagazzinaggio

In caso di lunghi periodi di immagazzinaggio ricoverare la macchina, con le batterie completamente cariche, in ambiente asciutto e ventilato. Se possibile lasciare collegato e alimentato il caricabatterie per consentire il mantenimento delle batterie, altrimenti ricaricare le batterie regolarmente ogni 2 mesi.

Temperatura di stoccaggio: -20/+50°C.

Prima di utilizzare la macchina dopo un periodo di immagazzinamento superiore a 90 giorni eseguire le verifiche riportate nella tabella riassuntiva della manutenzione, alla voce "dopo lunghi periodi di inattività".

Smaltimento e rottamazione

La macchina è composta principalmente da acciaio, alluminio, plastica, gomma sintetica e rame.

Particolare attenzione va rivolta allo smaltimento delle batterie elettriche (D.Lgs. 188/08) e dell'olio idraulico contenuto nel serbatoio e all'interno del circuito idraulico (DPR 691/82).

Di seguito elenchiamo i principali componenti della macchina.

- Ghisa
- Nylon
- Acciaio
- Teflon
- Rame
- Policarbonato
- PVC
- Ertalyte

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4. MANUTENZIONE

La lunga durata di esercizio della macchina e la massima sicurezza di funzionamento sono garantite da una manutenzione accurata ed assidua.

I tempi indicati nella tabella riassuntiva alla manutenzione si riferiscono a condizioni di utilizzo normali; in caso di condizioni di lavoro difficili (temperature estreme, atmosfera inquinante, umidità elevata, alta quota, ecc) devono essere ridotti.

La frequenza e l'estensione della manutenzione periodica e dei controlli può dipendere da regolamenti di carattere nazionale.

Eseguire le normali operazione di manutenzione con braccio distributore completamente abbassato e macchina ricoverata e spenta.

La movimentazione o il sollevamento di parti pesanti devono essere fatti mediante l'uso di un apparecchio di sollevamento di portata adeguata.

Durante la manutenzione indossare adeguati dispositivi individuali di protezione.

Durante la manutenzione recintare l'area di lavoro o esporre dei cartelli per impedire l'accesso agli estranei.

Pulizia della macchina

Al termine di ogni turno di lavoro o quando lo si ritiene necessario procedere alla pulizia della macchina:

- pulire tutte le superfici con un soffiaggio di aria compressa, cercando di non creare cumuli di sporco;
- spruzzare un normale prodotto sgrassante e rimuovere lo sporco rimasto con stracci di cotone.

Non usare mai prodotti diluenti, raschietti e spazzole di acciaio per non danneggiare le superfici verniciate.

Non pulire la macchina utilizzando getti di acqua in pressione; la penetrazione di acqua o umidità all'interno dei componenti elettrici potrebbe provocare malfunzionamenti e/o danneggiamenti agli organi elettrici/elettronici di comando.

Pulizia del braccio distributore

Al termine di ogni turno di lavoro o quando lo si ritiene necessario procedere alla pulizia di tutte le parti del braccio che sono state a contatto con il materiale pompato o con additivi e prodotti chimici in genere:

- evitare di dirigere getti d'acqua sui perni di articolazione, sugli steli dei cilindri e su tutti gli elementi dell'impianto elettrico;
- assicurarsi sempre che i perni di articolazione siano liberi da calcestruzzo; anche gli steli dei cilindri devono essere perfettamente puliti.

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Tabella riassuntiva ispezioni

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Tabella Riassuntiva Ispezioni				
Tipo	**Frequenza**	**Prima responsabilità**	**Qualifica del Service**	**Riferimenti documentali**
Ispezione di Pre-Avvio	Prima di ogni utilizzo e ad ogni cambio operatore	Utente o Operatore	Utente o Operatore	Manuale d'Uso e Manutenzione
Ispezione di Pre-Spedizione	Prima di ogni spedizione o noleggio	Costruttore o Noleggiatore	Meccanico Qualificato IMER	Manuale d'Uso e Manutenzione
Controllo Semestrale	Ogni 6 mesi	Noleggiatore	Meccanico Qualificato IMER - Centro Assistenza	Manuale d'Uso e Manutenzione
Controllo Annuale	Ogni 12 mesi; non oltre 13 mesi dalla data del precedente controllo	Noleggiatore	Centro Assistenza	Manuale d'Uso e Manutenzione
Manutenzione Preventiva	Annualmente	Noleggiatore	Centro Assistenza	Manuale d'Uso e Manutenzione

Tabella riassuntiva manutenzioni

Si consiglia un controllo annuale eseguito da un centro assistenza autorizzato.

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OPERAZIONI DA ESEGUIRE	DOPO LE PRIME 50 ORE	OGNI GIORNO	SETTIMANALE	MENSILE	100 ORE O 6 MESI	250 ORE O ANNUALE	DOPO LUNGHI PERIODI DIINATTIVITA' (90 gg)
Controllo targhe e adesivi		o					o
Verifica livello olio e sostituzione				o			o
Sostituzione cartuccia filtro olio	o					o	o
Ingrassare gli organi di movimento					o		o
Controllo serraggio viti	o				o		o
Verifica batteria di avviamento		o					o
Verifica sicurezze		o					o
Controllo movimenti manuali d'emergenza					o		o
Verifica freni					o		o
Controllo strutture	o			o			o
Controllo stato tubi idraulici						o	o
Controllo cavi di potenza e ausiliari						o	o
Controllo prestazioni						o	o
Manutenzione cingoli in gomma	o				o		o
Controllo giunzioni		o					o
Rotazione tubazioni			o				o
Controllo usura tubazioni				o			o

Nelle pagine seguenti vengono descritte le operazioni indicate in tabella.

Manutenzione motore endotermico

Di seguito viene riportata la tabella di manutenzione del motore benzina. Per le spiegazioni consultare il manuale di uso e manutenzione del motore allegato alla macchina.

Motore benzina **OPERAZIONI DA ESEGUIRE**	AD OGNI USO	20 ORE O MENSILE	50 ORE O 3 MESI	100 ORE O 6 MESI	300 ORE O ANNUALE
Controllo livello olio motore	X				
Cambiare olio motore				X	
Controllo filtro aria			X		
Pulire filtro aria			X		
Sostituire filtro aria					X
Pulire pozzetto del filtro				X	
Controllare - registrare candela				X	
Sostituire candela					X

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Manutenzione motore elettrico

Verificare periodicamente che:

- il motore funzioni senza vibrazioni o rumori anomali;
- l'ingresso dell'aria dal copriventola non sia ostruito;
- sul motore non ci siano tracce di polvere, olio o altre impurità.

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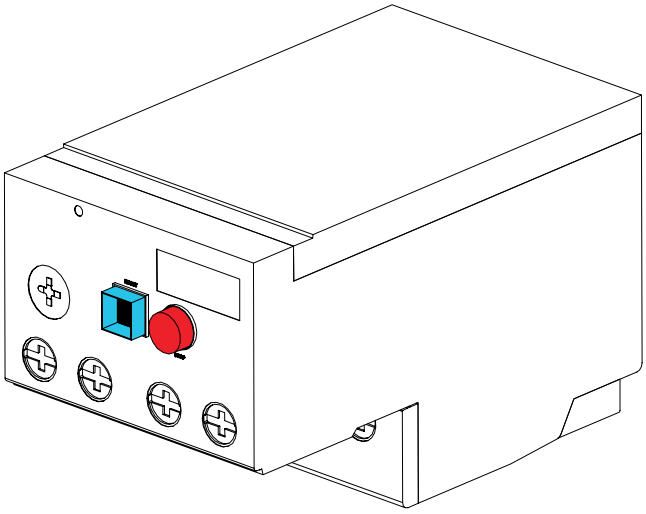
Relè termico

Per proteggere il motore elettrico da eventuali sovraccarichi di corrente è stato disposto sulla macchina un relè termico.

Effettuare il test per il buon funzionamento del relè.

1. Aprire la scatola di protezione del relè termico.
2. Accendere il motore elettrico.
3. Premere il tasto rosso di STOP del relè.
4. Verificare che il motore si spenga.
5. Riarmare il motore con il tasto blu di RESET.



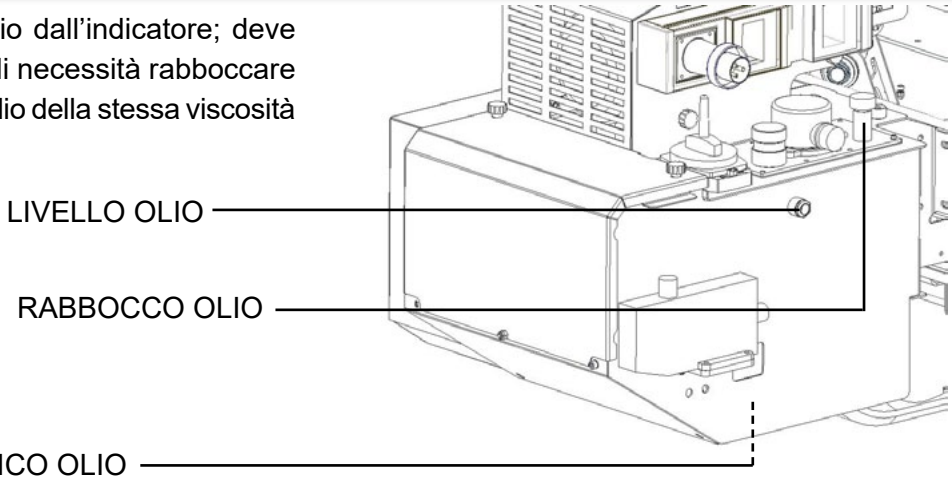
Controllo targhe e adesivi

Verificare la presenza e la leggibilità di tutte le targhe ed adesivi.

Verifica livello olio e sostituzione

La verifica del livello dell'olio e l'eventuale rabbocco devono essere eseguiti con macchina ricoverata.

Verificare il livello dell'olio dall'indicatore; deve essere a metà. In caso di necessità rabboccare dal tappo superiore con olio della stessa viscosità indicata sul serbatoio.



Le condizioni d'uso della macchina e la qualità dell'olio idraulico impiegato, eliminano la necessità di prescrivere la sostituzione dell'olio a intervalli regolari. Durante i controlli verificare che l'olio mantenga le sue caratteristiche di limpidezza, colore e viscosità; in caso di necessità eseguirne la sostituzione.

IMER consiglia comunque di **sostituire completamente l'olio ogni 3 anni.**

La completa sostituzione dell'olio deve essere eseguita con macchina ricoverata.

Per il totale scarico dell'olio il serbatoio è provvisto di tappo posto sotto il serbatoio stesso.

- Scaricare tutto l'olio dal serbatoio in apposito contenitore.
- Chiudere il tappo di scarico.
- Aggiungere nuovo olio dal tappo di carico.

L'olio idraulico è un prodotto inquinante.

Evitare perdite di fluido idraulico servendosi di vasche di raccolta e cautelarsi contro perdite accidentali e fuoriuscite del fluido idraulico con prodotti oleoassorbenti.

L'olio esausto deve essere raccolto e non disperso nelle normali condutture di scarico; ditte specializzate si incaricano di smaltire o eventualmente riciclare gli olii industriali, sotto la tutela delle leggi vigenti nei singoli stati.

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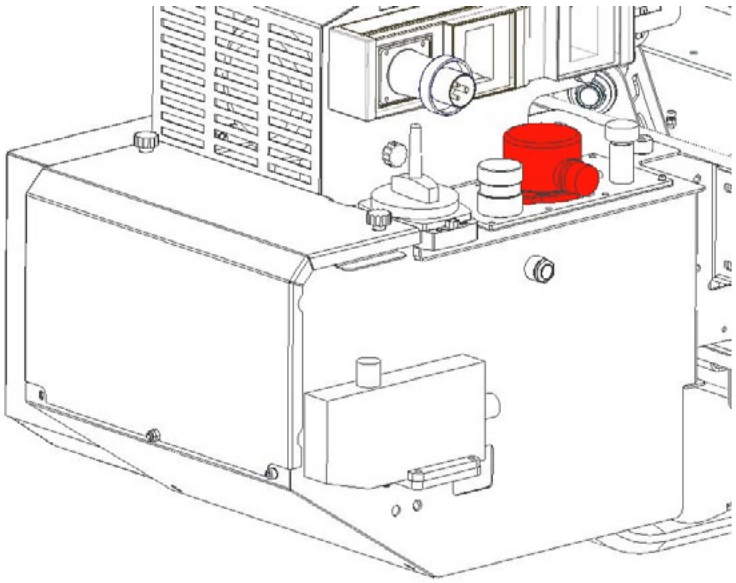
Sostituzione cartuccia filtro olio

La prima sostituzione della cartuccia deve essere effettuata dopo le prime 50 h di lavoro per eliminare dall'impianto idraulico i residui di lavorazione dei tubi e dei componenti idraulici.

La cartuccia, inoltre, deve essere sostituita:

- ad ogni cambio d'olio;
- in base agli intervalli previsti nella tabella di manutenzione;
- quando sul display della pulsantiera compare il codice errore 556 e tutti i movimenti vengono rallentati.



Prima di effettuare l'operazione assicurarsi che la macchina sia spenta e completamente abbassata.

L'operazione implica dei versamenti di olio idraulico e pertanto è consigliabile dotarsi di recipienti per la raccolta.

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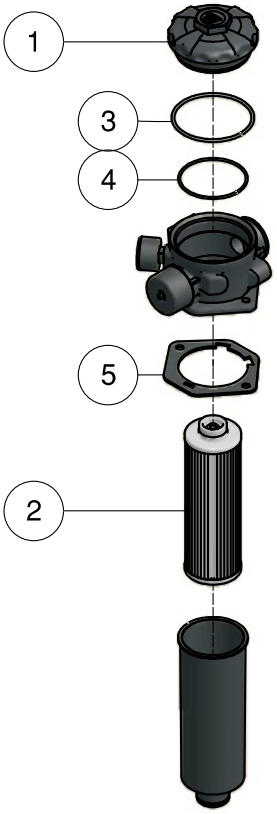
Filtro in scarico

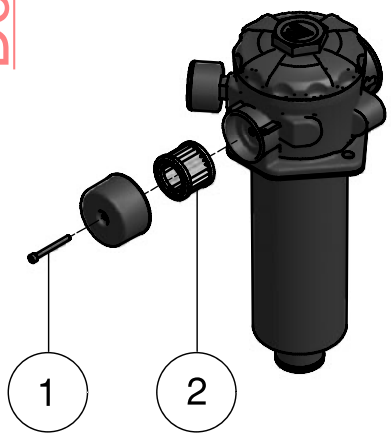
- Sollevare il braccio distributore.
- Abbassare il braccio distributore e, durante la discesa, controllare che il manometro del filtro dell'olio indichi una pressione inferiore ai 1,6 bar (zona verde).
- Se la pressione è superiore, sostituire la cartuccia del filtro.

Sostituzione cartuccia



- Svitare il tappo superiore del filtro (1).
- Estrarre la cartuccia filtrante (2).
- Assicurarsi che nel fondo del contenitore non vi siano depositati residui di particelle.
- Verificare che gli O-ring (3 - 4) e guarnizione (5) non siano danneggiati, in caso contrario provvedere alla sostituzione e di conseguenza al corretto posizionamento degli stessi.
- Inserire la nuova cartuccia filtrante lubrificando preventivamente l'O-Ring di tenuta.
- Avvitare il coperchio prestando attenzione all'imbocco della filettatura;. serrare con coppia di serraggio pari a 30 Nm.
- Riavviare la macchina per alcuni minuti.
- Assicurarsi che non vi siano perdite.
- Ripetere l'operazione di controllo filtro.

Filtro sfiato aria



Il filtro dell'aria va sostituito ogni volta che si sostituisce la cartuccia del filtro in scarico.

Se si lavora in ambienti molto polverosi occorre sostituirlo più frequentemente.

Sostituzione

Togliere la vite di fermo del cappuccio metallico (1).

Sostituire il filtro dell'aria (2) e riavvitare il cappuccio, facendo attenzione a non stringere troppo per evitare di schiacciare il filtro stesso.

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Ingrassare gli organi di movimento

Ralla

- 3 ingrassatori sulla vite senza fine.
- 2 ingrassatori ai fianchi del carro per la ruota dentata.

Stabilizzatori

- 1 sul cilindro.
- 1 sul perno.

Incastellatura

- Tutti i perni dei cilindri dispongono di ingrassatore.

Controllo serraggio viti

DESCRIZIONE	TIPO	Q.Tà	Coppia di serraggio	
			Nm	kgm
Viti di fissaggio ralla alla torretta	M16X110 UNI5931	12	250	25
	M16X60 UNI5739	4	250	25
Viti di fissaggio motore trazione a portacingolo	M10x25 UNI5931	16	50	5
Viti di fissaggio motore a ruota trazione	M10x30 UNI5931	16	50	5

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Verifica batteria di avviamento

La batteria AGM non richiede la verifica del livello dell'elettrolito.

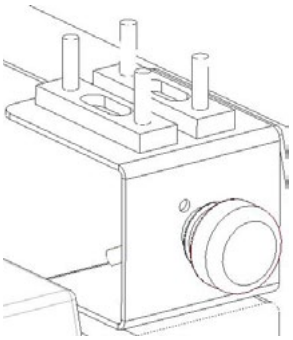
Pulire le superfici di contatto dei morsetti, lubrificare con grasso antiacido o vaselina.

Carica della batteria

Il livello di carica della batteria è visibile sulla pulsantiera.

Per ricaricare la batteria vedi paragrafo "Ricarica della batteria".

Sostituzione della batteria



- La batteria è alloggiata nella parte anteriore del carro.
- Portare in posizione OFF lo staccabatterie.
- Aprire il coperchio di protezione del vano batteria.
- Staccare i morsetti dalla batteria iniziando sempre dal polo negativo (-).
- Riattaccare i cavi elettrici cominciando sempre dal polo positivo (+).

Sostituire la batteria con una di equivalenti caratteristiche.

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Verifica sicurezze

I seguenti test permettono di verificare il corretto funzionamento di tutti i dispositivi di sicurezza della macchina.

I sistemi di sicurezza applicati alla macchina sono inevitabilmente soggetti ad usura e staratura, pertanto è indispensabile mantenerli controllati ed in stato di efficienza; altresì non è corretto affidarsi ciecamente al loro funzionamento nella valutazione delle condizioni operative e di sicurezza.

La loro presenza non può sollevare l'operatore dalla responsabilità di un utilizzo consapevole ed adeguato della macchina.

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Pulsante rosso arresto di emergenza

- Premere il pulsante di arresto di emergenza dal pannello comandi a terra e verificare che nessuna operazione sia possibile né dal pannello comandi a terra né da pulsantiera. Riportare il pulsante in posizione ON.
- Premere il pulsante di arresto di emergenza da pulsantiera e verificare che nessuna operazione sia possibile né dal pannello comandi a terra né da pulsantiera. Riportare il pulsante in posizione ON.

Velocità motore endotermico

Prima di eseguire il controllo accertarsi dell'assenza di ostacoli nelle immediate vicinanze della macchina.

Nessuno dei 4 stabilizzatori deve essere in pressione; il motore da utilizzare è il motore endotermico (benzina).

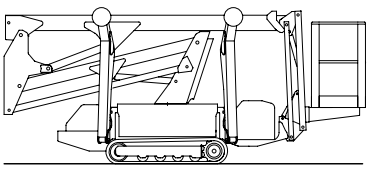
Iniziare il test da macchina ricoverata.

- Da pulsantiera accendere il motore, eseguire la salita del braccio principale fino all'arresto. Verificare che il motore non sia accelerato.
- Far scendere il braccio fino al raggiungimento della condizione di ricovero, verificare che il motore possa essere accelerato.

Microinterruttori

SQ12

1. Portare la macchina in posizione ***RICOVERATA*** e verificare l'accensione sul display della pulsantiera dell'icona:



2. In posizione di macchina ***STABILIZZATA E RICOVERATA*** alzare il braccio principale ed uscire dalla posizione di ricovero: verificare che la rotazione torretta sia abilitata.

Controllo movimenti manuali d'emergenza

Vedere paragrafo "Movimenti manuali d'emergenza".

Verifica freni

Buona tenuta

I freni di stazionamento devono essere in grado di trattenere la macchina sulla pendenza superabile indicata nella tabella "Dati tecnici".

Controllare la buona tenuta dei freni su una rampa con pendenza riportata nella tabella sopracitata, in entrambe le direzioni.

Spazi di frenata

Eseguire le prove con macchina in piano, motore endotermico acceso e in modalità "lepre".

MARCIA VELOCE

- Selezionare da pulsantiera la marcia veloce.
- Portare i manipolatori dei cingoli al massimo spostamento in avanti.
- Rilasciare i manipolatori e verificare che lo spazio di frenata sia inferiore a 60 cm.

MARCIA DI SICUREZZA

- Selezionare da pulsantiera la marcia di sicurezza.
- Portare i manipolatori dei cingoli al massimo spostamento in avanti.
- Rilasciare i manipolatori e verificare che lo spazio di frenata sia inferiore a 10 cm.

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Controllo strutture

Generale

- Controllare lo stato di protezione all'ossidazione delle strutture meccaniche e, se necessario, riprendere le zone ossidate.

Carro base

- Controllare visivamente o con liquidi penetranti le saldature più importanti.
  - Struttura portante.
  - Supporti ruote.
  - Perni di snodo.
  - Boccole; se necessario, sostituirle lubrificando con grasso.
  - Stato dei cingoli.

Torretta e colonnetta

- Controllo visivo o con liquidi penetranti delle saldature più importanti (supporto incernieratura braccio principale).
- Controllo del buon posizionamento e fissaggio dei vari componenti (ralla, perni incernieratura braccio principale, ecc).
- Controllo del buon posizionamento e fissaggio delle zavorre.
- Controllo dello stato della ralla e del pignone di rotazione.

Braccio distributore

- Controllo visivo o con liquidi penetranti delle saldature più importanti (braccio principale, secondo braccio, terzo braccio).
- Controllo del buon posizionamento e fissaggio dei vari componenti (perni di incernieratura, giunzioni, ecc.).

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Controllo stato tubi idraulici

L'olio idraulico è un prodotto inquinante.

Evitare perdite di fluido idraulico servendosi di vasche di raccolta e cautelarsi contro perdite accidentali e fuoriuscite del fluido idraulico con prodotti oleoassorbenti.

- Controllare visivamente tutte le giunzioni idrauliche ed, eventualmente, eseguire un serraggio sui raccordi.
- Controllare lo stato dei tubi idraulici flessibili; se necessario, sostituirli.

Controllo cavi di potenza e ausiliari

Verificare il serraggio dei terminali elettrici, il corretto posizionamento dei cavi, l'assenza di corrosione e di abrasioni.

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Controllo prestazioni

Per effettuare i controlli illustrati di seguito è necessario munirsi di un cronometro.

Eseguire le prove con macchina in piano, con motore acceso.

Marcia di sicurezza

- Selezionare da pulsantiera la marcia di sicurezza.
- Portare i manipolatori dei cingoli al massimo spostamento in avanti.
- Verificare che la macchina percorra la distanza di 10 m in un tempo superiore a 65 s.

Salita / discesa braccio principale

- Selezionare da pulsantiera il sollevamento del braccio principale e verificare che impieghi circa 40 s per eseguire la salita completa.
- Eseguire la discesa del braccio principale e verificare che impieghi circa 30 s.

Rotazione torretta

- Selezionare dal pannello comandi a terra la rotazione torretta e verificare che impieghi:
  - circa 100 s per eseguire la rotazione completa verso destra;
  - circa 100 s per eseguire la rotazione completa verso sinistra.

Apertura / chiusura secondo braccio

- Selezionare da pulsantiera l'apertura del secondo braccio e verificare che impieghi circa 30 s per eseguirla completamente.
- Eseguire la chiusura del secondo braccio e verificare che impieghi circa 25 s.

Apertura / chiusura terzo braccio

- Selezionare da pulsantiera l'apertura del terzo braccio e verificare che impieghi circa 30 s per eseguirla completamente.
- Eseguire la chiusura del terzo braccio e verificare che impieghi circa 25 s.

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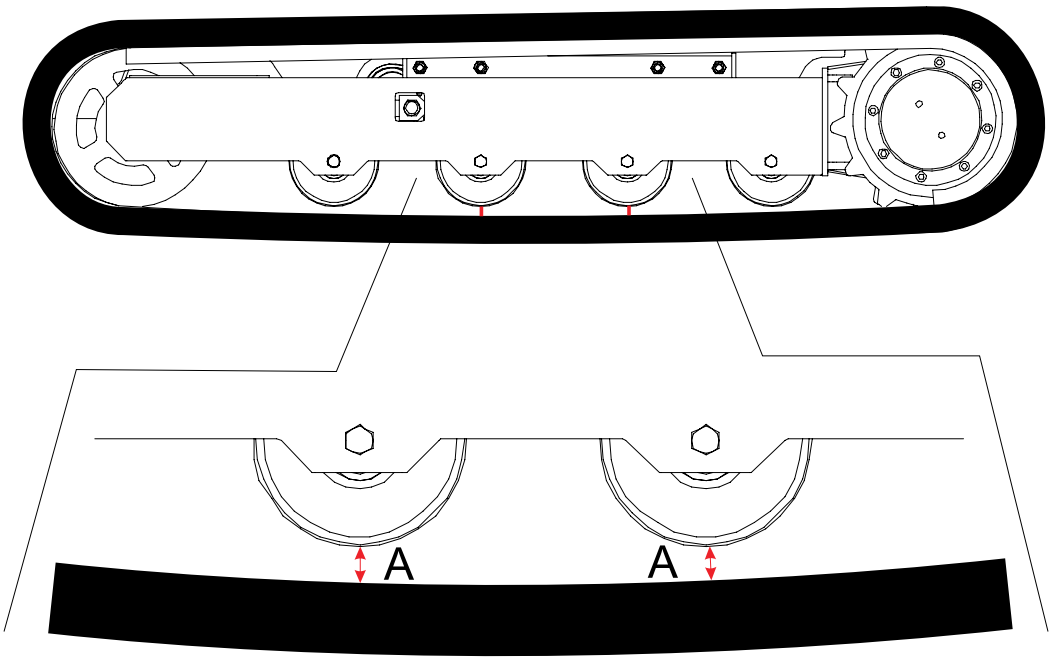
Manutenzione cingoli in gomma

Controllo tensione cingoli

- Portare la macchina su un terreno solido e pianeggiante.
- Eseguire la stabilizzazione della macchina.
- In corrispondenza dei 2 rulli centrali misurare la distanza A tra la parte esterna del rullo e la parte interna del cingolo in gomma.

La tensione è normale se la distanza è compresa tra 10 e 15 mm.



Se il valore di A non è compreso nei valori indicati, il cingolo è allentato o in tensione; vedi il paragrafo successivo: “Come allentare - tendere il cingolo”.

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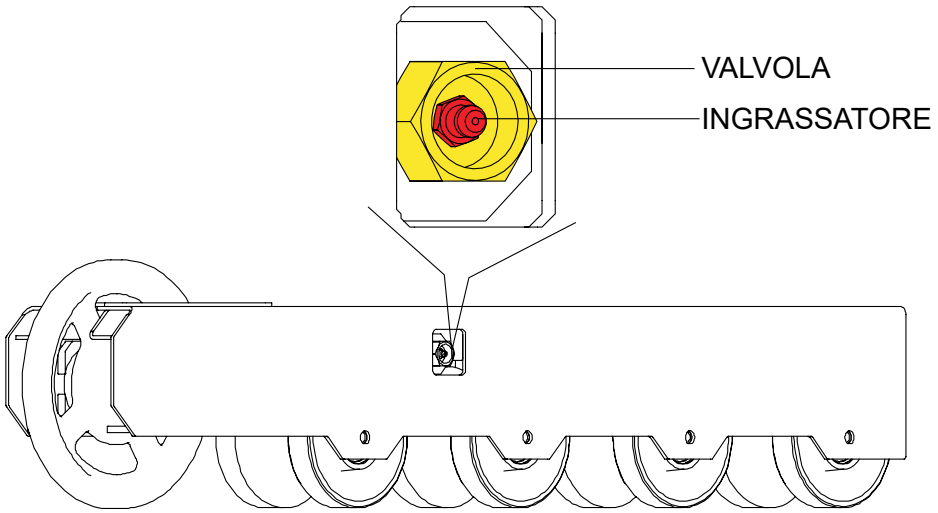
Come allentare - tendere il cingolo

Eseguire le operazioni con macchina stabilizzata.

Il grasso contenuto nel cingolo idraulico è sotto pressione. Non allentare la valvola per più di un giro; se la valvola viene allentata troppo, rischia di essere espulsa sotto l'effetto della pressione del grasso. Non allentare mai l'ingrassatore.



Per allentare il cingolo:

- svitare lentamente la valvola in senso antiorario per non più di 1/2 giro per far drenare il grasso; se il grasso non esce fate ruotare lentamente il cingolo;
- quando è stata ottenuta la giusta tensione del cingolo avvitare e stringere la valvola girandola in senso orario;
- pulire l'eventuale grasso fuoriuscito.

Per tendere il cingolo:

- collegare una pistola a grasso all'ingrassatore;
- aggiungere grasso finchè la tensione del cingolo raggiunge il valore corretto.

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Come sostituire i cingoli

Eseguire le operazioni con macchina stabilizzata.

Il grasso contenuto nel cingolo idraulico è sotto pressione. Non allentate la valvola per più di un giro; se la valvola viene allentata troppo, rischia di essere espulsa sotto l'effetto della pressione del grasso. Non allentate mai l'ingrassatore.

- Allargare i cingoli.
- Eseguire l'operazione per allentare il cingolo da sostituire:
  - svitare lentamente la valvola in senso antiorario per non più di 1/2 giro per far drenare il grasso; se il grasso non esce fate ruotare lentamente il cingolo.
- Togliere il cingolo.
- Prima di montare il nuovo cingolo assicurarsi del corretto senso di marcia.
- Ingranare le maglie del cingolo con la ruota dentata e posizionare l'altro capo del cingolo sulla ruota tendicingolo.
- Far ruotare la ruota motrice in retromarcia.
- Accertarsi che le maglie del cingolo siano correttamente ingranate nella ruota dentata e nella ruota tendicingolo.
- Regolare la tensione del cingolo.

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Controllo giunzioni

Verificare la tenuta delle giunzioni:

- se una giunzione presenta tracce di calcestruzzo, significa che la guarnizione non garantisce la tenuta;
- verificare che la guarnizione sia collocata correttamente;
- in caso di guarnizione usurata, procedere alla sostituzione;
- controllare giornalmente lo stato dei giunti e sostituirli immediatamente con equivalenti se presentano deformazioni.

Rotazione tubazioni

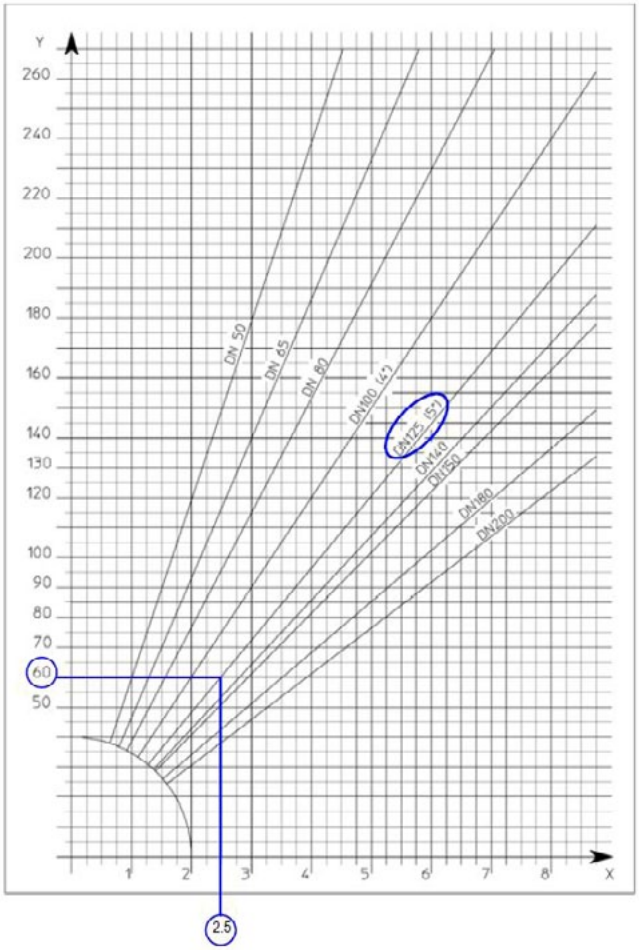
È consigliabile ruotare settimanalmente le tubazioni sul proprio asse per uniformarne l'usura e aumentarne la durata:

- ruotare tutte le tubazioni per il calcestruzzo di 120° in senso orario e le curve di 180°, al fine di distribuire meglio l'usura ottenenendo così una maggior durata;
- rispettare i valori minimi riportati al capitolo "controlo usura tubazioni".

Controllo usura tubazioni

Controllare lo spessore delle tubazioni per il calcestruzzo, mediante un misuratore di spessore:

- nel caso in cui lo spessore misurato dovesse essere inferiore a quello riportato sulla tabella sostituire i pezzi usurati con parti di ricambio originali.



Asse X = spessore minimo delle pareti [mm]
Asse Y = pressioni di lavoro [bar] (*) sul calcestruzzo
PL = Pressione di lavoro
DN = Diametro nominale

Esempio di lettura
PL = 60 [bar] (*)
DN = 125 [mm]

Tracciare una linea orizzontale a quota 70 sull'asse Y fino ad incrociare la retta DN 125.
Dal punto di incrocio tracciare una linea verticale fino ad incrociare l'asse X che determina lo spessore minimo delle tubazioni = 2.5 [mm].

(*) 1 bar = 0,1 MPa

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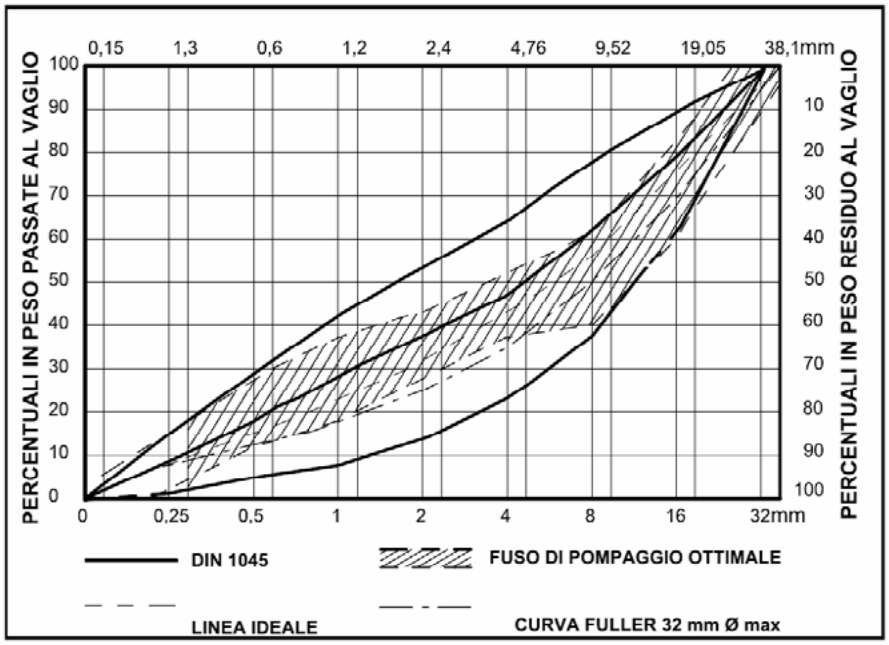
Note generali sui vari tipi di calcestruzzo in uso

Le note seguenti non hanno lo scopo di fornire notizie specifiche sul calcestruzzo, ma vogliono fornire informazioni utili al riconoscimento ed alla identificazione delle varie miscele.

Affinchè il calcestruzzo possa essere pompato e circolare senza difficoltà all'interno della tubazione è necessario che il medesimo risponda a determinate caratteristiche che ne garantiscano la pompabilità.



Il calcestruzzo è composto, essenzialmente, da quattro elementi:

1. cemento;
2. sabbia;
3. inerti;
4. acqua.

La composizione riferita al cemento

Il calcestruzzo può essere suddiviso, a grandi linee, in tre grandi categorie:

- **CALCESTRUZZO RICCO**: il contenuto di cemento è maggiore di 370 kg/m^3: alto indice di pompabilità;
- **CALCESTRUZZO MEDIO**: il contenuto di cemento è tra 300 - 370 kg/m^3: ha un buon grado di pompabilità e soddisfa la maggior parte delle esigenze di costruzione;
- **CALCESTRUZZO POVERO**: il contenuto di cemento è minore di 300 kg/m^3; il più economico, la cui pompabilità decresce rapidamente in rapporto al contenuto di cemento, per cui le precauzioni da adottarsi per la posa in opera devono essere maggiori.

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La funzione del cemento riferita alla pompabilità

Indipendentemente dalla funzione principale, che è quella di legante, il cemento agli effetti della pompabilità si comporta come lubrificante, riducendo notevolmente gli attriti che si creano fra gli inerti stessi e la tubazione.

Contenuti di cemento troppo bassi possono influire negativamente sulla resistenza meccanica del getto, peggiorando la pompabilità del calcestruzzo a causa degli attriti interni ad esso.

- **Contenuto basso di cemento**: aumento degli attriti, scarsa pompabilità e possibilità di intasamenti.
- **Contenuto corretto di cemento**: attriti contenuti, ottima pompabilità, assenza di intasamenti.
- **Contenuto elevato di cemento**: buona lubrificazione, aumento della viscosità, aumento delle perdite di carico.

Fatta questa prima classificazione in relazione al contenuto di cemento nel calcestruzzo, è bene stabilire chiaramente che il medesimo non è sufficiente a garantire una buona pompabilità, per quanto dia un valido contributo ad essa.

Resta inteso che non tutti i cementi hanno le stesse caratteristiche, per cui gli effetti risultanti non sono i medesimi.

Il metodo di produzione del cemento (Portland, Pozzolanico, Altoforno) e la sua classificazione rispetto alla macinazione (fine, media e grossa, cementi lunghi e corti) portano alla necessità di preferire il Portland come tipo ed i cementi lunghi ai corti.

Il Portland ha la virtù di trattenere bene l'acqua per la sua capacità di amalgamarsi ad essa; altri tipi non danno gli stessi risultati per cui l'acqua tende a separarsi e, come si dice in gergo, il calcestruzzo "piange"; è ovvio che tale effetto puó rendere difficoltoso il pompaggio.

La composizione riferita alla sabbia

Una buona sabbia, oltre che migliorare notevolmente il calcestruzzo come qualità, porta ad un minore costo del medesimo per il risparmio del cemento e, soprattutto, **rende il calcestruzzo molto più pompabile**.

La sabbia naturalmente deve avere una buona curva granulometrica (contenere nelle dovute proporzioni la varie grandezze dei grani).

Agli effetti di una buona pompabilità è desiderabile che la sabbia contenga delle parti molto fini, la cui misura sia al di sotto dei 0,2 mm. In genere il 7-12% in peso è un buon contenuto.

Gli inerti

Gli inerti possono essere classificati in due gruppi:

1. ghiaia naturale;
2. pietrisco di frantumazione.

Ghiaia naturale

È costituita da inerti a spigoli smussati, di forma grosso modo sferoidale dovuta all'usura avvenuta nel tempo in natura. **Si presta molto bene al pompaggio** dato che la sua forma presenta il minimo attrito sia tra gli inerti medesimi sia tra inerti e tubazione.

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Un calcestruzzo ben proporzionato può contenere inerti di dimensione massima pari a 1/3 del diametro della tubazione.

Se la percentuale di inerti maggiore è uguale o minore al 10% del totale, la dimensione degli inerti può essere leggermente maggiorata.

Pietrisco di frantumazione

A parte la difficoltà per alcuni cantieri di avere a disposizione ghiaia naturale, la tendenza attuale porta a preferire l'inerte di frantumazione la cui origine (roccia) è conosciuta e la cui durezza (resistenza) è classificata secondo il tipo di roccia (basaltica, granitica, dolomitica, ecc).

Con il frantumato **aumenta l'usura** per i seguenti motivi:

1. forma geometrica dell'inerte;
2. durezza dell'inerte.

Con la frantumazione l'inerte assume una forma geometrica a spigoli taglienti, che a contatto con il metallo delle tubazioni, rompe la pellicola lubrificante formata dal cemento e si comporta poi come un utensile da taglio che scava, poco a poco, la superficie metallica.

Si consiglia di ridurre la velocità massima di pompaggio al fine di aumentare la vita utile dei componenti.

L'acqua

Il corretto dosaggio dell'acqua è molto importante e viene normalmente definito col rapporto acqua - cemento.

Affinchè avvenga la reazione chimica di idratazione del cemento è sufficiente un contenuto di acqua di 30 litri per 100 kg di cemento.

Nella pratica però questa quantità di acqua viene aumentata per la necessità di ottenere un impasto sufficientemente plastico e quindi lavorabile.

Si ricordi comunque che in ogni caso deve essere usata la minima quantità di acqua compatibilmente con il grado di lavorabilità desiderato in quanto oltre il rapporto acqua-cemento di 0,30 la resistenza finale del calcestruzzo decresce in proporzione inversa a tale rapporto.

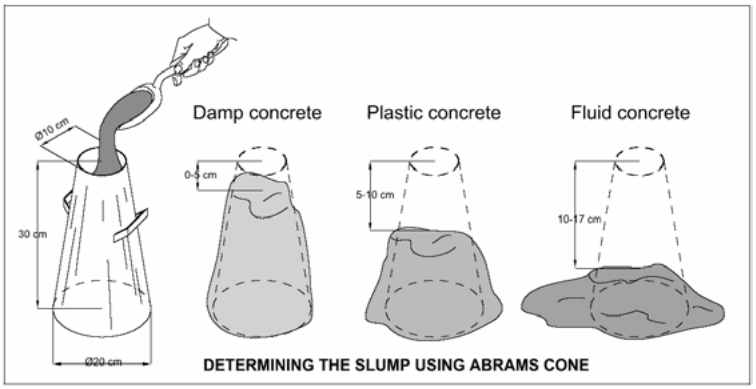
A seconda del tipo in opera detta consistenza può assumere un valore differente.

Consistenza elevata

Pannelli per prefabbricati, casseforme, travi ecc. La posa in opera richiede una energica vibrazione ed il rapporto acqua-cemento si aggira sullo 0,4%; la consistenza si aggira mediamente sui 3-8 cm di slump.

Consistenza bassa

Solette per copertura, getti con armature molto ravvicinate, ecc. Non è necessaria una vibrazione notevole, gli slumps generalmente usati si aggirano tra i 10 ed i 15 cm.



DETERMINING THE SLUMP USING ABRAMS CONE

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5. LIBRETTO DELLE ISPEZIONI

CONSEGNA DELLA MACCHINA AL PRIMO PROPRIETARIO

Il braccio distributore cingolato tipo _____

avente numero di fabbrica: _____

ed anno di costruzione _____

di cui al presente Registro di controllo è stata consegnata dalla _____

_____

in data _____

alla Ditta/Società:_____

_____

secondo le condizioni contrattuali stabilite, con le caratteristiche tecniche, dimensionali e funzionali specificate nel manuale di istruzioni.

_____

SUCCESSIVI TRASFERIMENTI DI PROPRIETA'

In data _____

la proprietà dela macchina in oggetto è trasferita alla Ditta/Società:

_____

_____

Si attesta che alla datasoprascritta le caratteristiche tecniche dimensionali e funzionali del braccio distributore cingolato sono conformi a quelle previste in origine e che eventuali variazioni sono state trascritte in questo Registro.

Il venditore L'acquirente

_____ _____

_____

SUCCESSIVI TRASFERIMENTI DI PROPRIETA'

In data _____

la proprietà della macchina in oggetto è trasferita alla Ditta/Società:

_____

_____

Si attesta che alla data soprascritta le caratteristiche tecniche dimensionali e funzionali del braccio distributore cingolato sono conformi a quelle previste in origine e che eventuali variazioni sono state trascritte in questo Registro.

Il venditore L'acquirente

_____ _____

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SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO IDRAULICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO IDRAULICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO IDRAULICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

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SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO ELETTRICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO ELETTRICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI COMPONENTI DELL'IMPIANTO ELETTRICO

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

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SOSTITUZIONE DI MECCANISMI O ELEMENTI STRUTTURALI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI MECCANISMI O ELEMENTI STRUTTURALI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI MECCANISMI O ELEMENTI STRUTTURALI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica_____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

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SOSTITUZIONE DI DISPOSITIVI DI SICUREZZA E RELATIVI COMPONENTI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica _____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI DISPOSITIVI DI SICUREZZA E RELATIVI COMPONENTI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica _____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

SOSTITUZIONE DI DISPOSITIVI DI SICUREZZA E RELATIVI COMPONENTI

In data _____ il particolare _____

di fabbricazione _____

E' STATO SOSTITUITO con _____

di fabbricazione _____ n. di fabbrica _____

note _____

_____

Causa della sostituzione _____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

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VERIFICHE DI MANUTENZIONE PERIODICA

L'utente ha l'obbligo di rispettare il programma di manutenzione e sorveglianza descritto sul presente manualedi istruzioni.

NR.	Data	Descrizione dell'intervento	FIRMA
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NR.	Data	Descrizione dell'intervento	FIRMA
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AVARIE DI UNA CERTA ENTITA' E RELATIVE RIPARAZIONI

Descrizione dell'avaria _____

_____

_____

Cause _____

_____

_____

Riparazioni effettuate _____

_____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

Luogo Data

_____ _____

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AVARIE DI UNA CERTA ENTITA' E RELATIVE RIPARAZIONI

Descrizione dell'avaria _____

_____

_____

Cause _____

_____

_____

Riparazioni effettuate _____

_____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

Luogo Data

_____ _____

AVARIE DI UNA CERTA ENTITA' E RELATIVE RIPARAZIONI

Descrizione dell'avaria _____

_____

_____

Cause _____

_____

_____

Riparazioni effettuate _____

_____

_____

Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

Luogo Data

_____ _____

AVARIE DI UNA CERTA ENTITA' E RELATIVE RIPARAZIONI

Descrizione dell'avaria _____

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_____

Cause _____

_____

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Riparazioni effettuate _____

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Il responsabile della ditta incaricata della sostituzione L'Utente

_____ _____

Luogo Data

_____ _____

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IMER International S.p.A.

Sede legale e amministrativa
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

Sede Operativa
Equipment Division
Via della Meccanica, 39 (Zona industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

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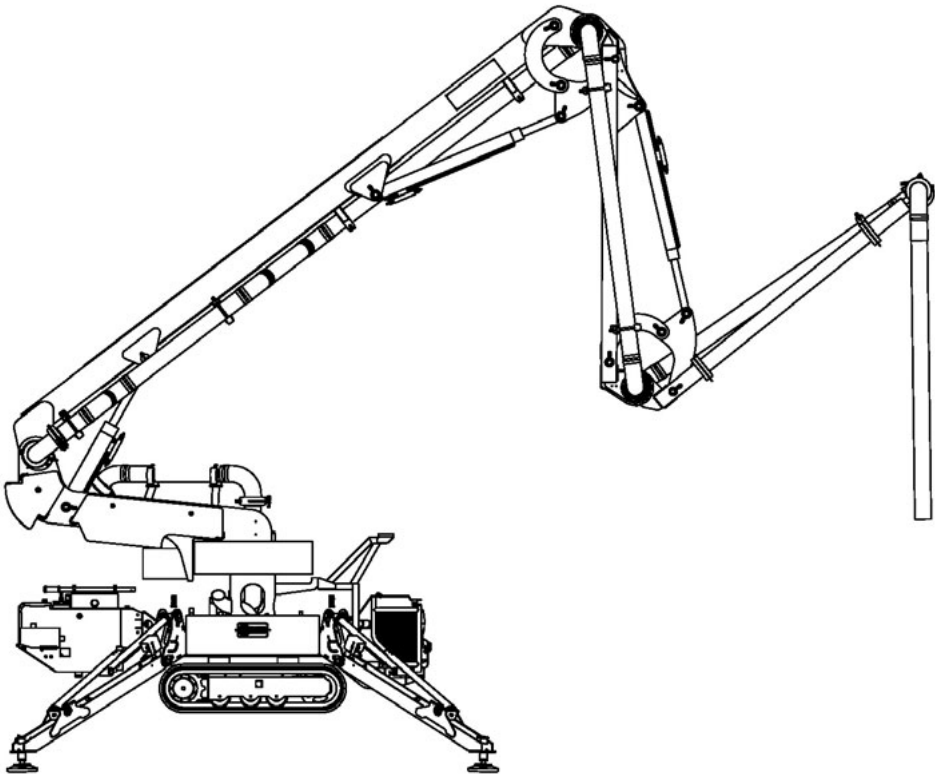
SELF-PROPELLED CRAWLER CONCRETE DISTRIBUTION BOOM USE AND MAINTENANCE MANUAL

MUM GERRIS 800 EN R01 05/2023

GERRIS 800



TRANSLATION OF THE ORIGINAL INSTRUCTIONS

CE

EN

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IMER International S.p.A.

Registered and administrative office
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

Operational Headquarters
Equipment division
Via della Meccanica, 39 (Zona Industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

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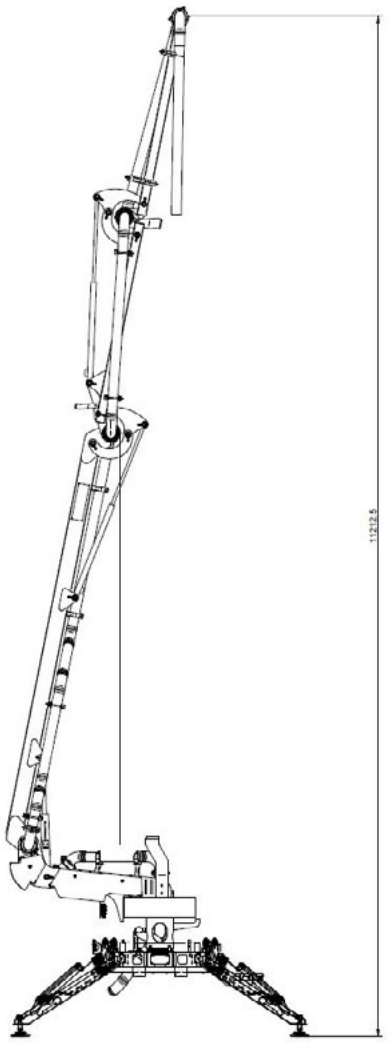
1. INTRODUCTION

This volume contains the use and maintenance manual of the self-propelled crawler concrete distribution boom:

GERRIS 800



Designed and manufactured with:

- petrol engine;
- hydraulic operation and proportional controls;
- remote control by radio remote control.

GERRIS 800 reaches a height of 11.20 m and can be used both outdoors and indoors.

Only trained and authorised personnel may use this machine.

The purpose of the use and maintenance manual is to provide the necessary instructions for correct and safe use of the machine to avoid serious damage to yourself and to others.

All the information in this manual is mandatory and must be read carefully and understood before starting to use the machine.

The use and maintenance manual is an important work tool and must be stored in the appropriate compartment and be available at any time.

All texts highlighted by the frame provide safety warnings and should be read with particular attention.

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Static and dynamic tests

Prior to commissioning, the static and dynamic tests required by the harmonised standard EN 280 in section 6.3 have been carried out.

Assistance service

For interventions, repairs and servicing, contact the authorised workshops. For further information, contact the Technical Assistance Service.

Spare parts service

A guarantee of good operation and durability can only be achieved by using original spare parts; for this purpose consult the “SPARE PARTS CATALOGUE”.

In the requests for spare parts as well as in the request for interventions always mention the data shown on the identification plates located on the chassis.

Responsibility

IMER International S.p.A. will remain exempt from any liability and obligation for any damage caused to persons or property due to one of the following reasons:

- failure to comply with the instructions indicated in this USE AND MAINTENANCE MANUAL with regard to operation, use and maintenance of the machine;
- incorrect manoeuvres in use and maintenance of the machine;
- changes made to the structure or components of the machine without prior authorisation from IMER International S.p.A. and/or without the use of appropriate equipment;
- events unrelated to normal and correct use of the machine described in this USE AND MAINTENANCE MANUAL;
- the use of non-original spare parts not authorised by the manufacturer.

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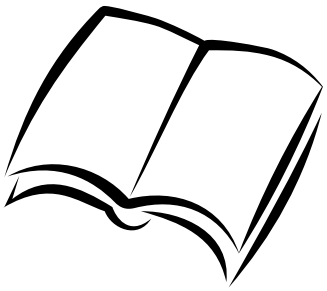
General safety recommendations

Manual



Adequate safety at work is essential to avoid serious personal harm and harm to others. It is therefore necessary to read and understand this manual which provides basic and precise instructions for use of the machine and for maintenance operations.

This manual is to be considered as part of the machine. It must always remain on board and be kept for subsequent reference.

The user manual must be kept by the user throughout the life of the machine, even in case of loan, rental or resale.

The images shown in this manual DO NOT always reproduce exactly the model described but are used for greater and easier understanding of the text.

Safety systems

The safety systems applied to the machine are inevitably subject to wear and calibration. It is essential to monitor them and to keep them in a state of efficiency. It is incorrect to rely blindly on their operation in the assessment of operational and safety conditions.

Their presence cannot exempt the operator from responsibility for informed and adequate use of the machine.

It is strictly forbidden to remove, modify or tamper with parts of the self-propelled distribution boom that are important for safety and stability.

Any tampering with the main parts and with the safety devices of the self-propelled distribution boom will invalidate the warranty conditions immediately.

If a safety-relevant defect is found, it must be recorded in the inspection booklet and the manufacturer must be informed in writing.

Labels and plates

Potential hazards and requirements concerning the machine are indicated by labels and plates; it is therefore necessary to ensure that they are legible and in a good condition.

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Operator requirements

Only trained and authorised personnel may use this machine.

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The operator must:

1. have readand understood all the documentation annexed to the machine, be instructed in correct use of the machine and be aware of the safety devices and regulations;
2. be physically fit and must not use drugs, alcohol or medication that could affect their attention, reaction, vision or hearing;
3. always give priority to safety and refuse to operate when they feel they cannot work safely;
4. when working at a height, use suitable fall arrest systems;
5. always have a suitably trained ground assistant in areas lacking a clear view;
6. always use an assistant in areas where visibility is obstructed;
7. always work in maximum safety, order and cleanliness;
8. before using the machine, check the controls and safety devices daily and make sure they are effective and efficient;
9. check that the work area is free from persons, animals and obstacles before carrying out any movement of the machine;
10. check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards;
11. always remove the key at the end of work and when the machine remains unattended in order to prevent unauthorised persons from using it in any way;
12. remove the key when work is finished or during breaks, in order to avoid unauthorised or unintentional use. A spare key must be kept by the safety manager so that the ground control station can be used as an emergency station (in the event of a fault, emergency descent is possible).

In particular

- Be aware that remotely controlled tracked machine can only be used by qualified personnel.
- Do not hand over the push-button panel to persons who have not received adequate training.
- Become familiar with the symbols and positions of the levers for the performing of functions and movement.

- Always check, before starting work, the functionality of the emergency stop button on the push-button panel.
- When moving the machine, use the push-button panel from the ground to remain at an appropriate distance from the machine. Unauthorised persons must not remain inside the work area of the machine.
- Release all levers if the movement of the machine becomes uncontrollable and immediately press the emergency stop button on the push-button panel.
- Always press the emergency button on the push-button panel when the unit is not in use. This also applies to short interruptions.
- Always press the emergency button on the push-button panel at the end of the work. The push-button panel must be kept out of the reach of unauthorised persons.
- Repairs, maintenance work, etc. must be carried out with the boom stationary and resting on a suitable support; if necessary, stabilise and level the machine using the special hydraulic stabilisers.

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Distance from power lines

The machine is not electrically insulated and does not offer any protection against contact with active parts of unprotected or insufficiently protected power lines and electrical systems.

Below is a table of the safety distances to be complied with according to Italian law.

In other countries there may be laws with different limitations that the operator must respect.

Un (kV)	**Minimum permitted distance** (m)
≤ 1	3
10	3,5
15	3,5
132	5
220	7
380	7

Un = rated voltage

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Non-permitted operations

It is strictly forbidden to use the machine:

- driving on public roads;
- in the event that the ambient lighting does not guarantee sufficient visibility to carry out the work or to move safely;
- in case of severe thunderstorms, with or without rain, or with a wind speed greater than 12,5 m/s, sixth degree of the beaufort scale below;
- moving with the hoods open;
- if the work area is not clear of obstacles that could cause hazardous conditions;
- coming into contact with fixed or movable objects;
- in poor working condition;
- contrary to the user instructions;
- using the distribution boom as a crane or mechanical boom to move loads;
- altering or removing the safety devices;
- attaching it to adjacent structures;
- in an environment with insufficient ventilation and in atex environments;
- in the presence, in the entire work area, of unauthorised personnel; if this is the case, they must be sent away.

In addition, the following are forbidden:

- moving the aerial part when the machine is on the platform of a truck or other vehicle;
- using the boom for purposes other than unloading and distributing concrete, mortar, sand, gravel or similar materials with a specific weight not exceeding 2.4 kg/dm3;
- standing or walking within the operating range of the boom while it is being moved, used or maintained; keep a safe distance;
- climbing onto the machine to get on it;
- jumping from the machine to get off it;
- changing the diameter of the pipes secured to the boom structure and used for concrete distribution;
- using pipes of a different diameter than those supplied, which would change the load on the boom;
- connecting extensions to the concrete pipes of the boom;
- changing the length and the dimensions of the rubber end hose, connecting extensions or other devices;
- bending the rubber end hose or immersing it in concrete during pumping operations.

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Beaufort wind scale

	Wind description	Wind speed (km/h)	Wind speed (m/s)	Sea conditions	Ground conditions
0	Calm	0	0	Calm sea (mirror)	Smoke rises vertically
1	Gust of wind	1-6	0.3-1.5	Light ripples on the surface resembling fish scales. No white foam ridges yet.	Wind motion visible in smoke.
2	Light breeze	7-11	1.6-3.4	Minute waves, still very short but very obvious. The crests do not break yet, but they look glassy	The wind can be felt on bare skin. Leaves rustling
3	Light breeze	12-19	3.4-5.4	Waves with crests that begin to break with glassy foam. Wave foaming evident with a white foam crest.	Smaller leaves and branches in constant motion
4	Moderate wind	20-29	5.5-7.9	Waves tending to extend. Wave foaming is more frequent	Lifting of dust and paper. Branches are shaken
5	Stiff wind	30-39	8.0-10.7	Moderate waves with an elongating shape. Plentiful wave foaming and there is a possibility of sprays.	Swaying of bushes with leaves. Small waves form in inland waters.
6	Fresh wind	40-50	10.8-13.8	Large waves (rolling) with foam-white crests. Sprays are likely	Movement of large branches. Difficulty using umbrella.
7	Strong wind	51-62	13.9-17.1	Rolling waves becoming bigger. The foam formed by the breaking of waves is “blown” in strips in the direction of the wind.	Whole trees shaken. Difficulty walking against the wind
8	Gale	63-75	17.2-20.7	High waves. The crests break and form swirling sprays that are sucked in by the wind	Twigs torn from trees. It is generally impossible to walk against the wind
9	Strong gale	76-87	20.8-24.4	High waves with crests that begin to roll. Foam strips that become thicker.	Slight damage to structures (chimneys and tiles removed).
10	Storm	88-102	24.5-28.4	Very high waves topped by very long (swells) crests. The foam strips tend to compact and the sea looks whitish. The breakers are much more intense and visibility is reduced.	(Rare onshore) Tree uprooting. Considerable structural damage.
11	Violent storm	103-117	28.5-32.6	Huge waves that could even hide medium-sized ships from view. The sea is covered with foam banks. The wind mists the summits of crests and visibility is reduced.	Severe devastation. Extensive structural damage
12	Hurricane	> 117	> 32.5	Very high waves; air full of foam and spray, sea completely white	Very serious catastrophes Extensive and substantial damage to structures

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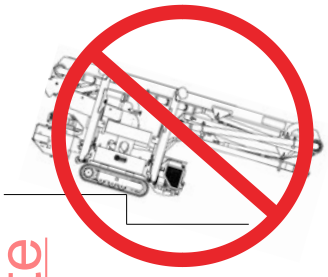
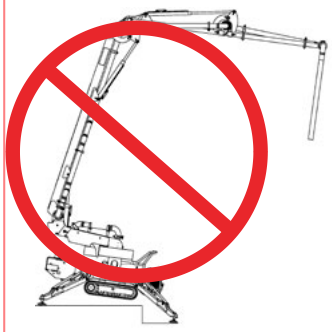
To reduce risks

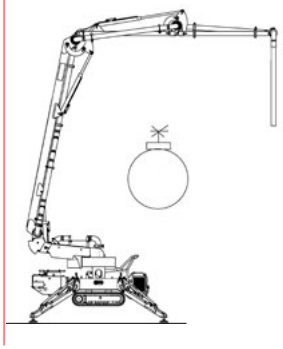
Follow the instructions below



Overturning risks

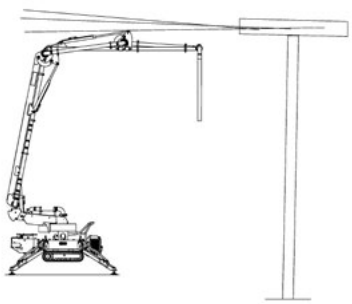
- Check that the soil is of proven consistency and solidity.
- Do not use the machine on slippery, icy, muddy or uneven ground or in the presence of holes, which have a slope greater than the permitted limit.
- Maintain a distance of at least 2 m from steep slopes (ditches, steep terrain, etc.).
- Check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards.
- Avoid collisions against fixed or mobile obstacles.
- Do not use the machine as a crane, with materials suspended from the lifting structures.
- During all movements check that there are no obstructions around, above or below the machine.
- Move only if the visibility of the workspace is complete.
- Do not apply elements (e.g. panels) to the machine that increase wind exposure.





Risk of explosions or burns

- Do not use the machine near naked flames or heat sources.
- Recharge batteries in ventilated environments, away from heat sources and explosive liquids.
- Do not use the machine if it has oil leaks.
- Do not use the machine in environments with an explosive atmosphere.
- Turn off the engine during refuelling.
- Refuel in a well-ventilated area.
- Dry any spilled fuel.
- Do not smoke while refuelling.



Electrical hazards

- As the machine is not electrically insulated, special care must be taken by the user to avoid any contact with potentially live parts.
- Work may not be carried out near power lines at a distance less than that indicated in the table on page 14.

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Risks related to the use of the distribution boom

- Periodically check the thickness of the pipes (see the “Maintenance” chapter).
- Should it be necessary to replace them, use original spare parts only.
- The performance of the pump must be suitable for the size of the pipes and couplings.
- The couplings must not be opened during pumping operations and, before opening them, the pipes themselves must be depressurised by sucking out the concrete.
- Firmly close the couplings after laying the pipes.
- Grout leaks indicate wear or deformation of the coupling-gasket-pipe assembly.
- It is advisable to rotate the pipes on their axis once a week to even out wear and increase their service life (see the “Maintenance” chapter).
- Check the condition of the lever couplings every day and replace them immediately with equivalent ones if they are deformed in any way.
- Never open the lever couplings when the pipes are pressurised; carry out the suction manoeuvre for at least 30 seconds first.
- Even after this manoeuvre, always keep your face and limbs away when opening the lever couplings to avoid being hit by any residual pressurised concrete.
- The lever couplings of the concrete pipes must be closed and locked using the appropriate pin.

Risks related to the distributor becoming clogged

Clogging is the condition in which the concrete flow tends to become blocked as a result as an obstruction in the pipe. In order to overcome the resistance created by the obstruction, the hydraulic circuit rises to its maximum value, thus creating extremely dangerous conditions. In this condition, by continuing to push, the pads may unblock the obstruction; the result is a “water hammer” effect which discharges onto the rubber end hose, triggering a potentially fatal whiplash.

- **A further serious risk, in the event of pressure peaks during pumping due to an obstruction, is the possible explosion of particularly worn sections of the pipe** (see the table showing the minimum permissible values, in the “Maintenance” chapter).
- The operator must report any symptoms of clogging in good time and, at the first abnormal rise in pumping pressure, stop the pump and the suction action.
- Pumping must then be resumed at low speed and very carefully.
- If clogging is occasional, pumping can almost certainly be resumed thanks to this manoeuvre.
- If the blockage is not eliminated, suck out all the concrete in the pipe to relieve the pressure, switch off the machine and remove the section of pipe affected by the blockage.

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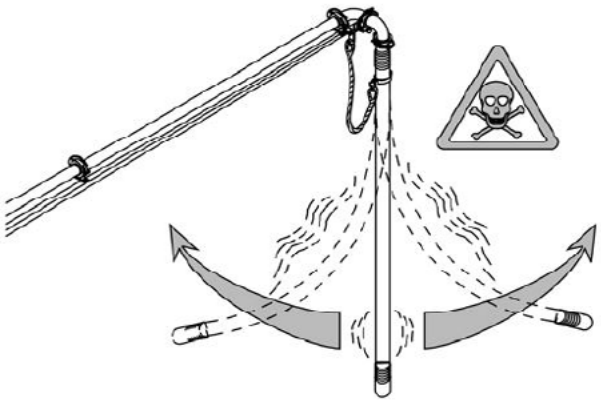
Risks related to the use of the rubber end hose



The rubber end hose must remain anchored to the last element of the distribution boom by means of the safety cable.

It is forbidden to manoeuvre or hold the rubber end hose.

Do not stand within the operating range of the rubber end hose.

The sudden release of any blockages may result in violent whiplash.

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Residual risks

The plates and stickers listed below indicate the residual risks that remain despite the protective measures integrated into the design of the machine and the safety devices adopted:

- risk of crushing;
- concrete splashes;
- pressurised hydraulic oil leaks;
- violent contact with the end hose due to sudden movements of the same;
- contact with hot parts.

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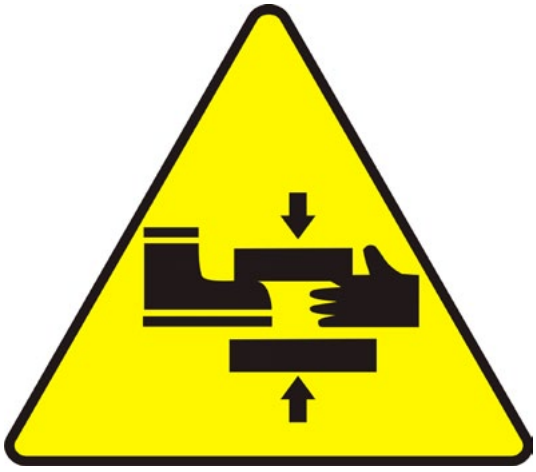

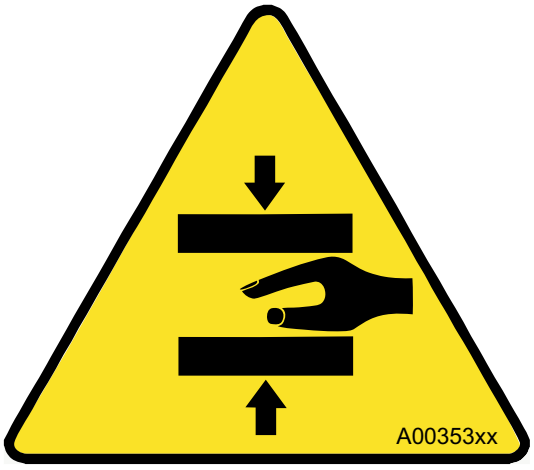

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2. DESCRIPTION OF THE MACHINE

The self-propelled crawler distribution boom GERRIS 800 is used for concrete distribution in any position within its working radius (see WORKING DIAGRAM on page 34), both outdoors and indoors.

It must be used in compliance with the technical data shown in the appropriate table, on soils of proven consistency and solidity and in conditions of verified operational safety by the Qualified Operator.

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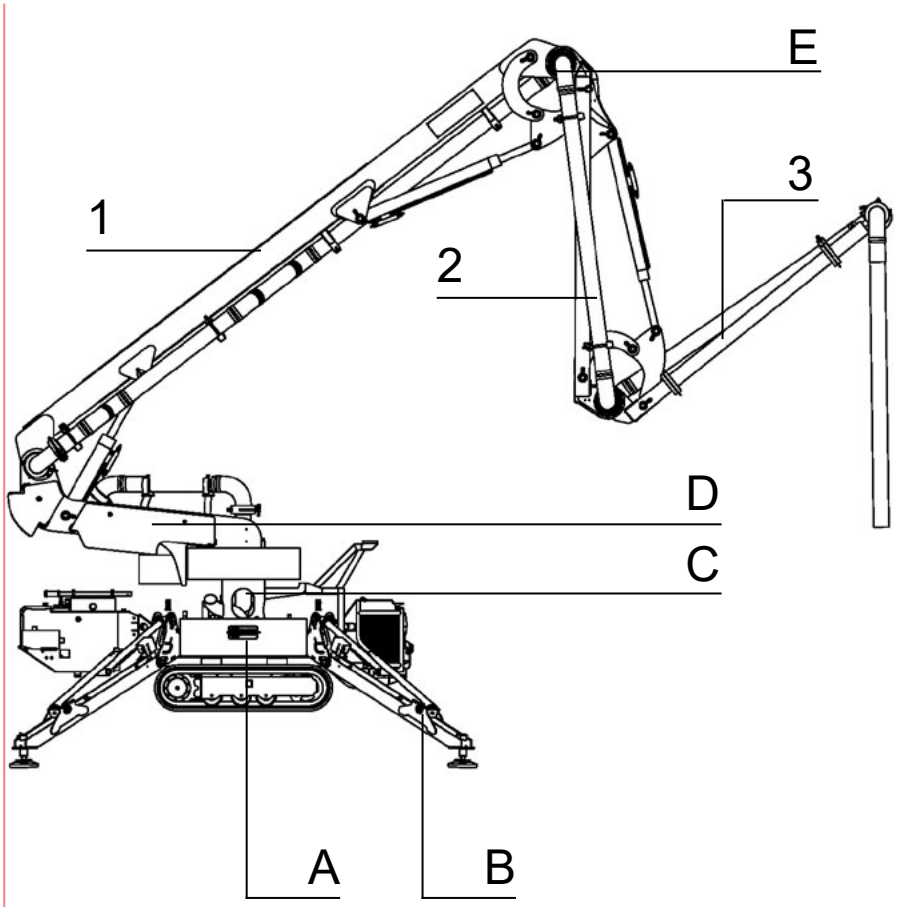

It consists of:

A. Base carriage
B. Stabilisers
C. Column
D. Turret
E. Distribution boom

The distribution boom lifting system 'E', supported by the turret, consists of 3 main structures operated by hydraulic cylinders:

1. Main lifting boom
2. Second boom
3. Third boom

Main components

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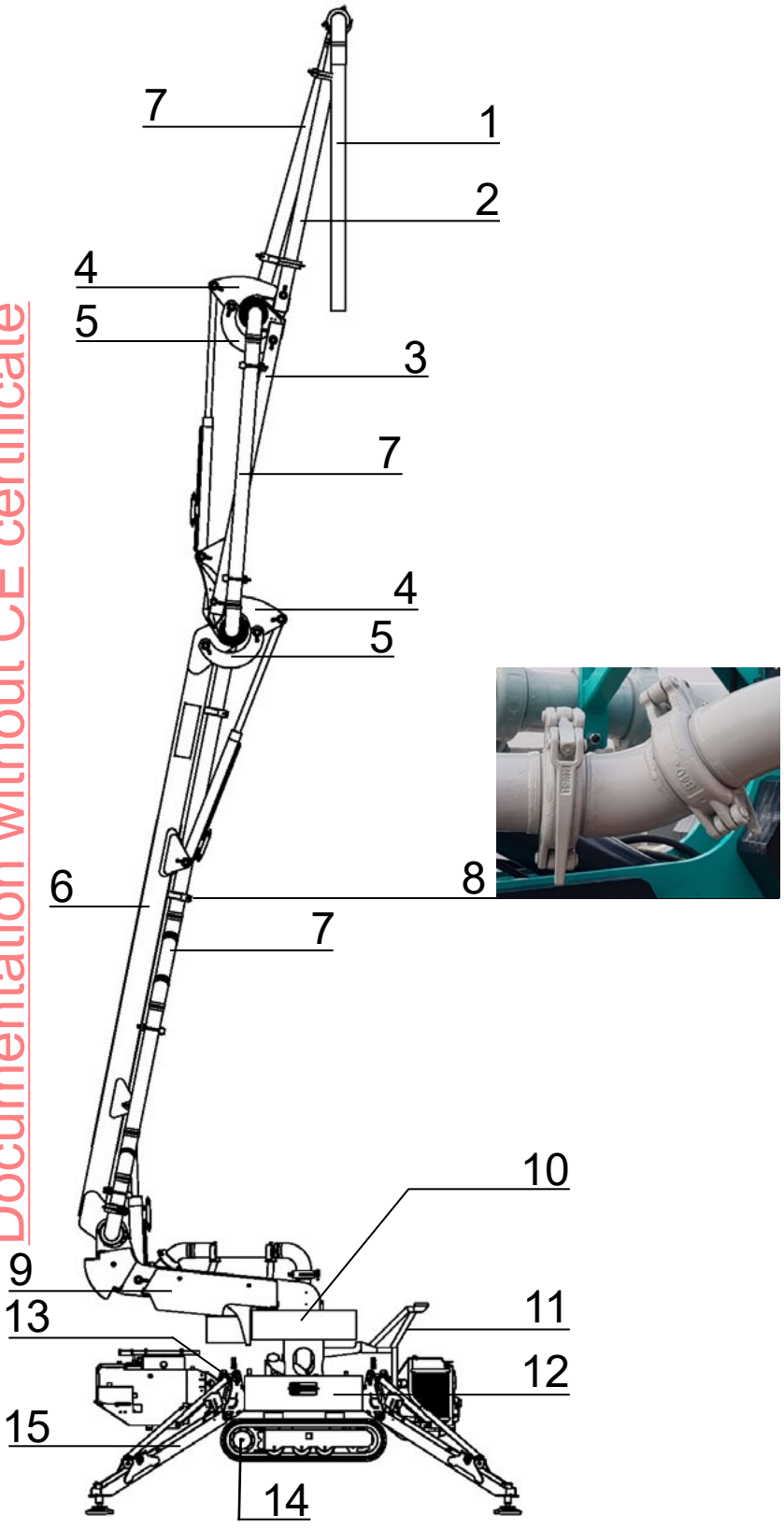
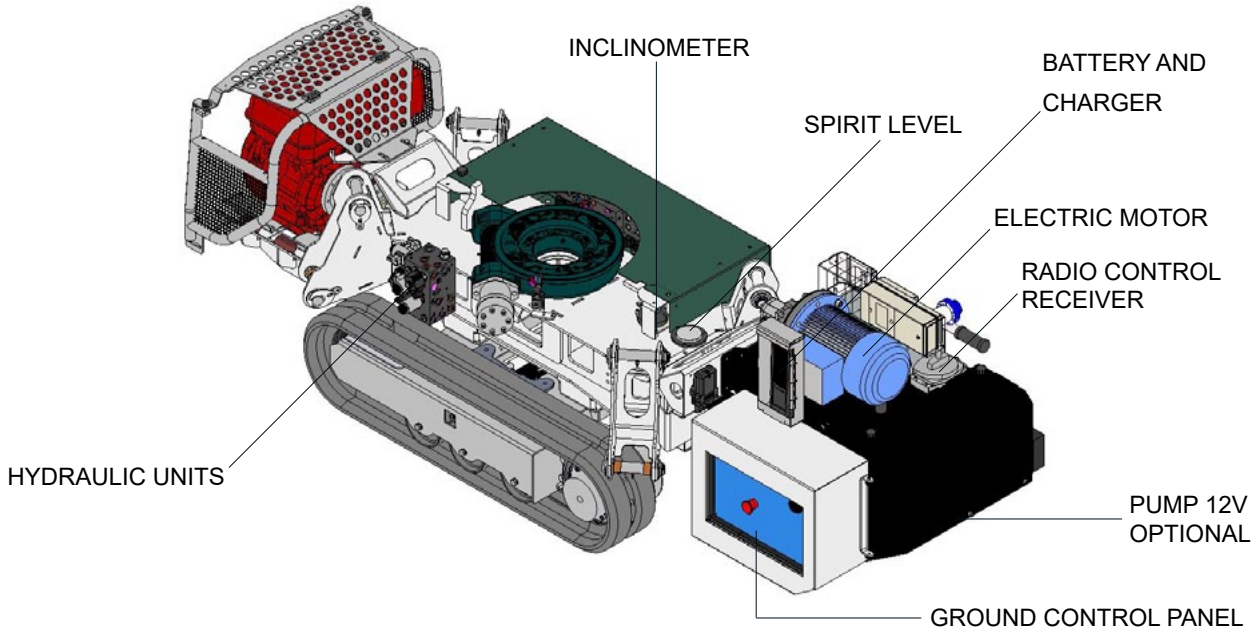


LEFT SIDE

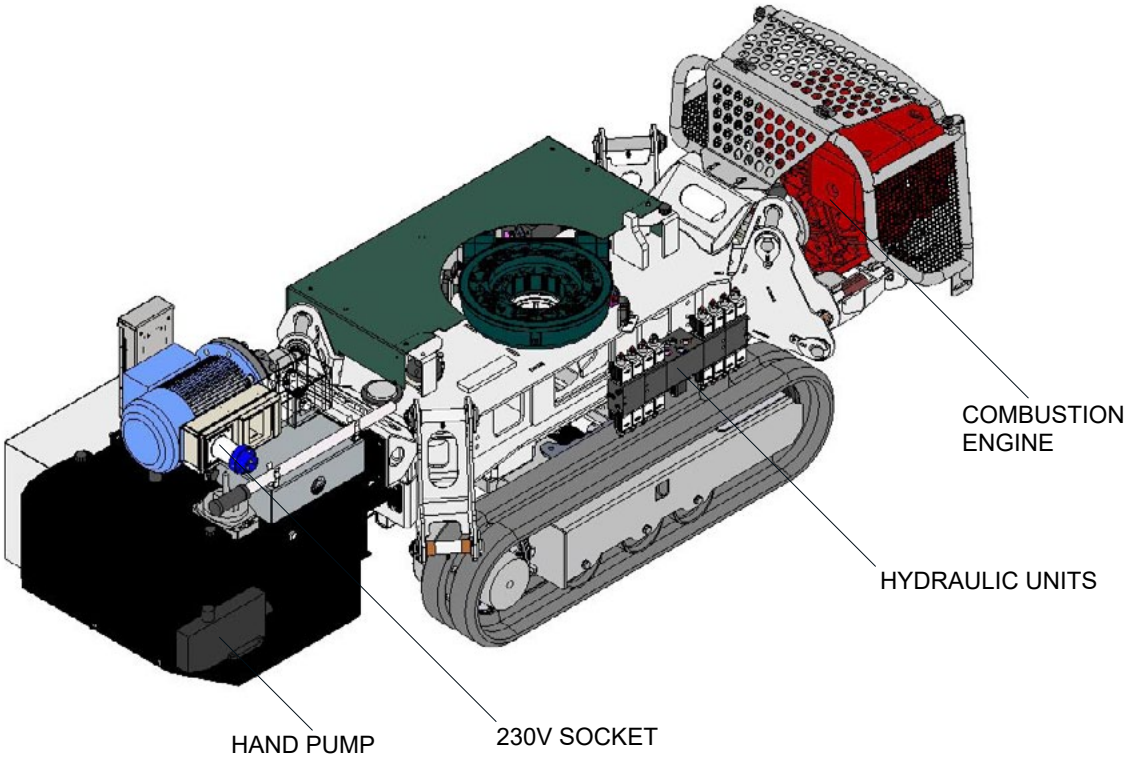
1. Rubber end hose
2. Third boom
3. Second boom
4. Spreader beams
5. Connecting rods
6. Main boom
7. Piping
8. Lever couplings
9. Turret and ballasts
10. Column
11. Distribution boom stowed away
12. Left box
13. Base carriage
14. Drive wheels
15. Stabilisers

Control and power devices

Right side



Left side



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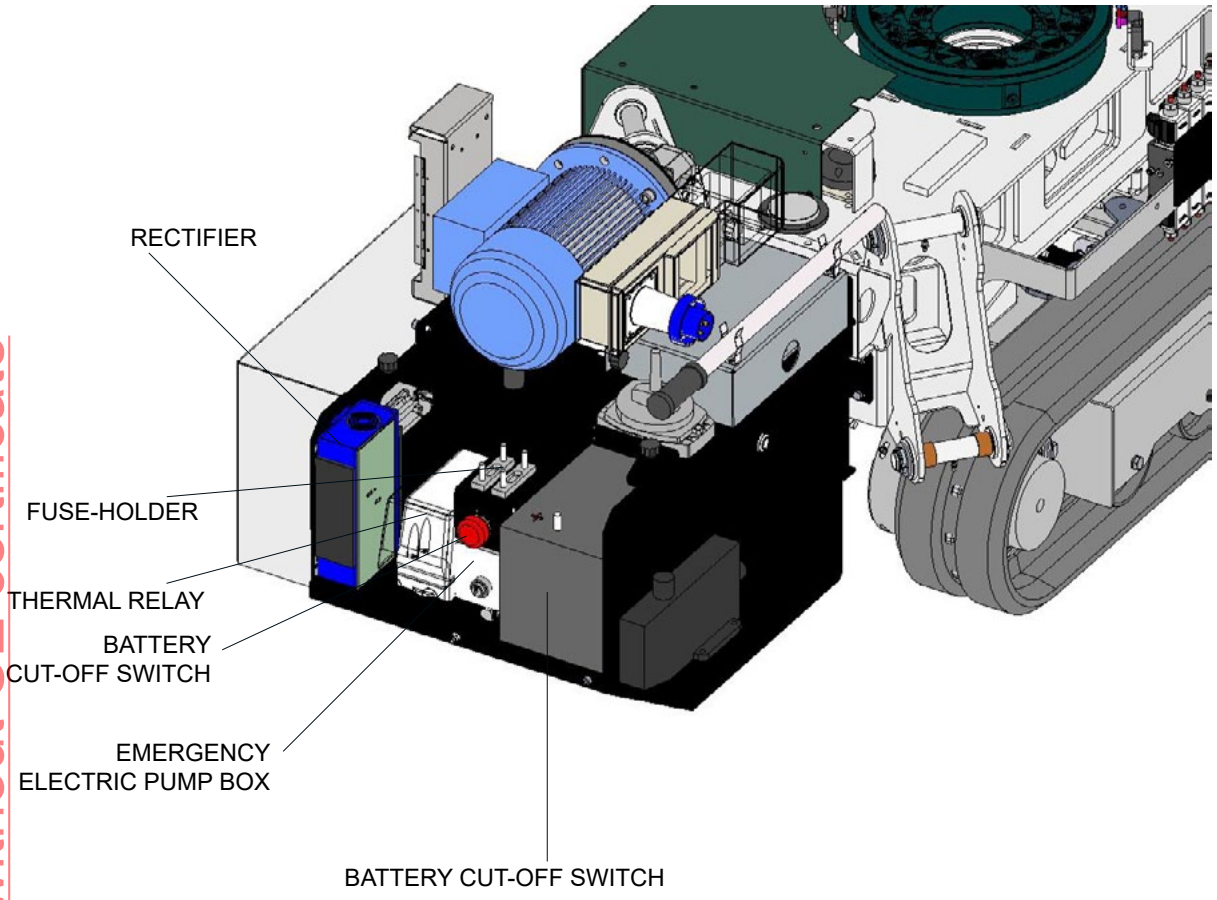
Tank side



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Electronic circuit

The electronic equipment includes the following microprocessor electronic devices for operation of the machine.

- Two main control units located behind the ground control panel.
- Receiver for radio control (communicating via the CAN Bus transmission protocol with the two main boards).
- Push-button panel with display (in communication with the receiver by wire or radio).

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Electrical circuit

The supply voltage must comply with the data plate of the electric motor. At full load, it must be between 205 V and 240 V.

To power the machine it is necessary to use a 2-pole + ground cable in order to ensure connection of the machine to the equipotential site system.

Power cord sizing

The power supply line must be adequately sized to avoid voltage drops. Avoid using winders. The sizing of the electrical supply cable conductors must take into account the operating currents and the length of the line to avoid excessive voltage drops

Cable section (mm^2)			
1.5	2.5	4.0	Cable length (m)
0 - 8	9 - 13	14 - 22	

The power cables used at the site must have a suitable external coating resistant to crushing, wear and weathering.

For the conformity of the power supply system, comply with the standard CEI-64-8 (CENELEC HD384 harmonisation document).

Proportionality of controls

The traction and all movements of the lifting system are proportional: based on the movements of the manipulators on the push-button panel, an electronic system provides a greater or lesser level of energy to the electro-hydraulic distributors that regulate the flow rate of oil to the hydraulic actuators.

Radio control

The radio control is a digital remote control system, based on microprocessor technology, protected against electromagnetic disturbances and radio disturbances.

The radio control consists of:

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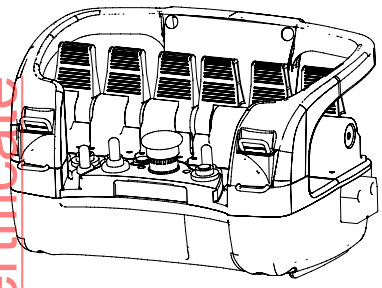
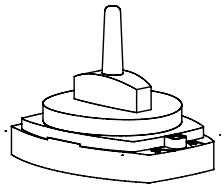
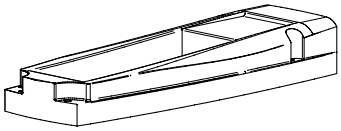


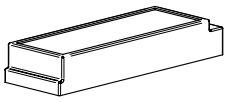
- a **PORTABLE CONTROL UNIT (PUSH-BUTTON PANEL)** with manipulators for proportional control of movements (switches and buttons for ON/OFF functions, warning lights, graphic LCD);



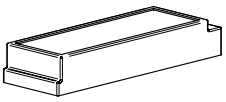
- a **RECEIVER UNIT;**



- a **BATTERY CHARGER;**



- two **batteries** for the push-button panel;



- a **SERIAL CABLE.**

The push-button panel and receiver are combined so that a radio control operates only the machine for which it is designed.

Where it is not possible to use the radio control (for example in airports) it is possible to connect to the push-button panel:

- on the ground via the serial control cable connected to the receiver (the cable is contained inside the document box).

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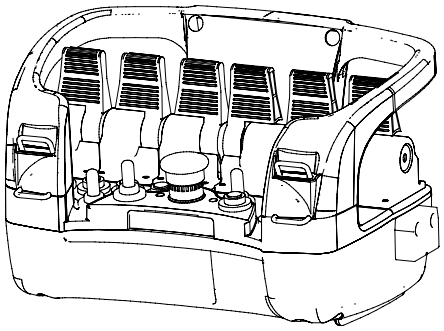
Push-button panel



The portable controller is sturdy, weatherproof, lightweight and compact.

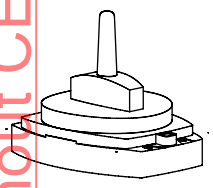
The operating levers and joysticks are proportional with spring return to the centre. The push-button panel is equipped with a mushroom button with an emergency stop function to stop all movements immediately.

The manipulators are surrounded by a protective frame against accidental activation and mechanical damage.

An LED and an acoustic signal are used to indicate regular operation, battery charge status and as a diagnostic tool for detecting any malfunctions.

For versions with radio control, the push-button panel uses a battery inserted at the bottom (see “Push-button panel battery”).

Receiver



The electronic control unit is contained in a sturdy plastic box and comes with connectors to which to connect the push-button panel.

The status and alarm indications are signalled through a 7-segment display located on the receiver.

In the event of a malfunction, the display will display "Er” followed by four characters divided into two blocks corresponding to the error code found.

If the problem encountered is considered “temporary”, the error code will be repeated 3 times and then the radio control will return to standby, as though just turned on.

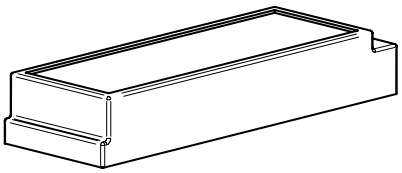
Otherwise, if the malfunction is considered “blocking”, the display will show the error code continuously until the radio control is switched off.

The error code can occur after the receiver is started or after the push-button panel is started (enabling of operating mode).

Push-button panel battery for radio control

The battery inserted at the bottom of the push-button panel allows use via radio. Another battery is supplied to always charge the battery charger.

Replacement is quick and very easy to perform. The operation of a charged battery is approximately 8 hours.



When the battery is about to run out, the push-button panel emits three beeps as a warning and the red ON LED starts flashing (LED to the left of the emergency mushroom). Under charged battery conditions the red ON LED is lit.

The battery must be used until the red ON LED turns off, after which it must be changed. If the battery capacity is too low, the push-button panel may not turn on.

Battery capacity and operating performance are reduced in extreme cold conditions. The battery recharges automatically when using the push-button panel with the serial cable.

In order to minimise battery consumption, and for safety reasons, the push-button panel automatically turns off after a 30-minute idle period.

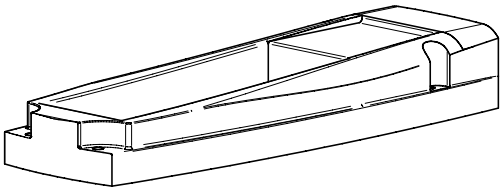
Battery charger

The battery charger is housed in the box on the right side of the electric motor door casing.

It is powered by the 12 V battery to start the engine and is designed not to damage the battery even if subjected to long cycles of continuous charging.

At the top of the charger there are two LED indicators:

- **Red LED** (power supply) - It indicates the presence of the power supply voltage;
- **Green LED** (charging status):
  - **flashing**, the battery is charging (the charger is in fast charging mode);
  - **on steady**, the battery is charged (the charger is in charging mode).



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Recharging the radio control battery

The charger starts a charging cycle when a battery is inserted (the green LED starts flashing). Charging of the radio control battery takes place in two consecutive phases:

- first phase with a high current, to reach the nominal charge level in a short space of time;
- second phase, with a reduced current, to maintain the charge reached until the battery is removed.

The time normally taken to charge a depleted battery is approximately 3 hours (the green LED is on steadily).

If there is no voltage to the device, the charger remembers the last work mode and resumes charging in “fast” or “maintaining” mode when the power is restored.

As a precaution, the charger always stops charging after 3 hours, even if the battery has not reached full charge. After charging, the green LED will always remain on.

Battery charging with serial cable

If the operator is using the push-button panel with the serial cable connected, the battery in the battery compartment will be automatically recharged.

If necessary, the push-button panel can be used as an alternative tool for charging batteries even when the system is not being used.

Insert the battery into the appropriate housing (emergency push-button panel button pressed) and connect the serial cable between the push-button panel and the receiver. The charging time is approximately 12-14 hours.

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Technical data

Description	Unit of measurement	GERRIS 800
Max height	m	11,2
Maximum reach	m	7,8
Depth of casting	m	5,0
Overall dimensions stabilized machine	m	2,92 - 3,08
Traction speed	km/h	0 - 2,5
Safety speed (enabling with machine open)	km/h	0 - 0,4
Passable slope	°	18
Maximum permitted lateral inclination of the carriage	°	1
Turret rotation	°	355
Combustion engine	kW/omdr.	8.2/3600
Electric pump	V/kW	230/2,2
Battery	V/Ah	12/110 C20
Battery charger	V/A	12 /12
Maximum stabiliser load	daN	1930
Machine weight	kg	2500
Oil tank	l	30
Measured sound power level	dB	102
Guaranteed sound power level	dB	104
Transport width (without pipe support / with support)	m	0,8/1,04
Transport length	m	4,9
Transport height	m	2
Maximum hydraulic pressure	bar	230
Operating temperatures	°C	-20 ÷ +40

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Ground pressures

Track pressure = 0,90 kg/cm^2

Stabiliser plate pressure = 4,34 kg/cm^2 (standard plate diameter 20 cm)

Stabiliser plate pressure = 1,42 kg/cm^2 (optional plate diameter 35 cm)

Dimensions and spaces

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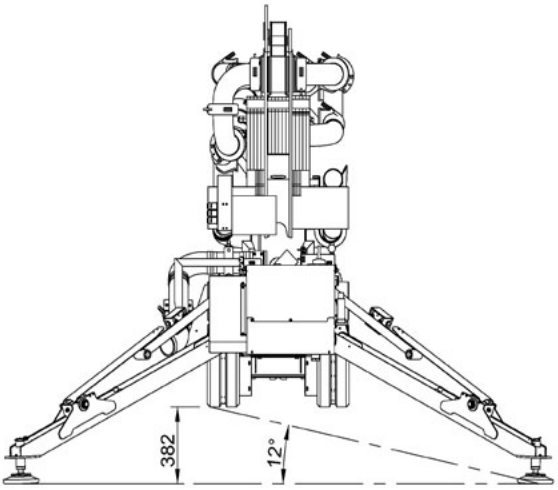

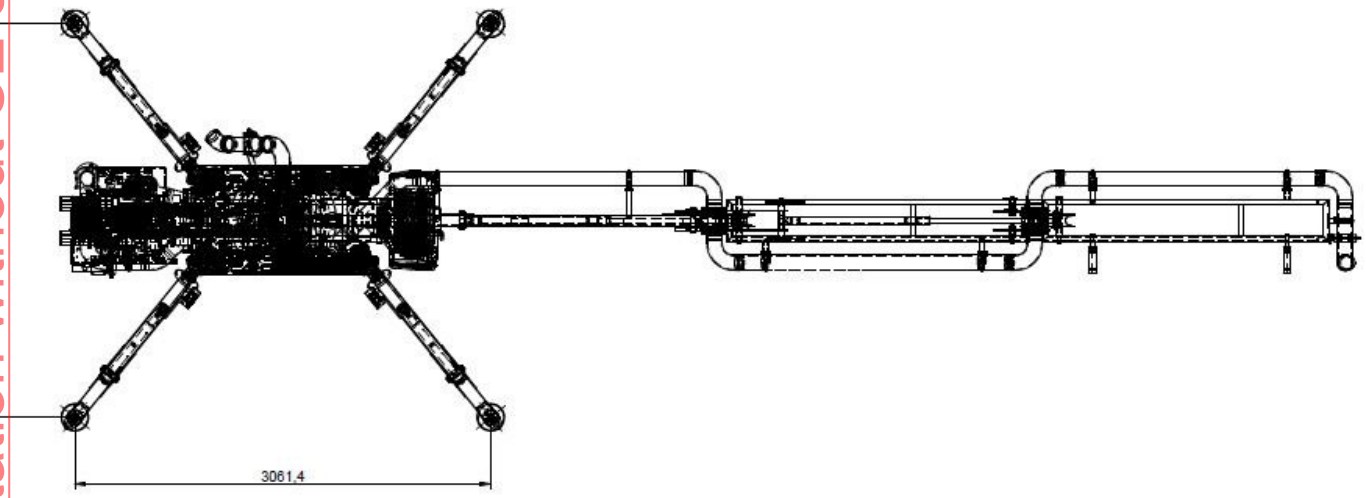

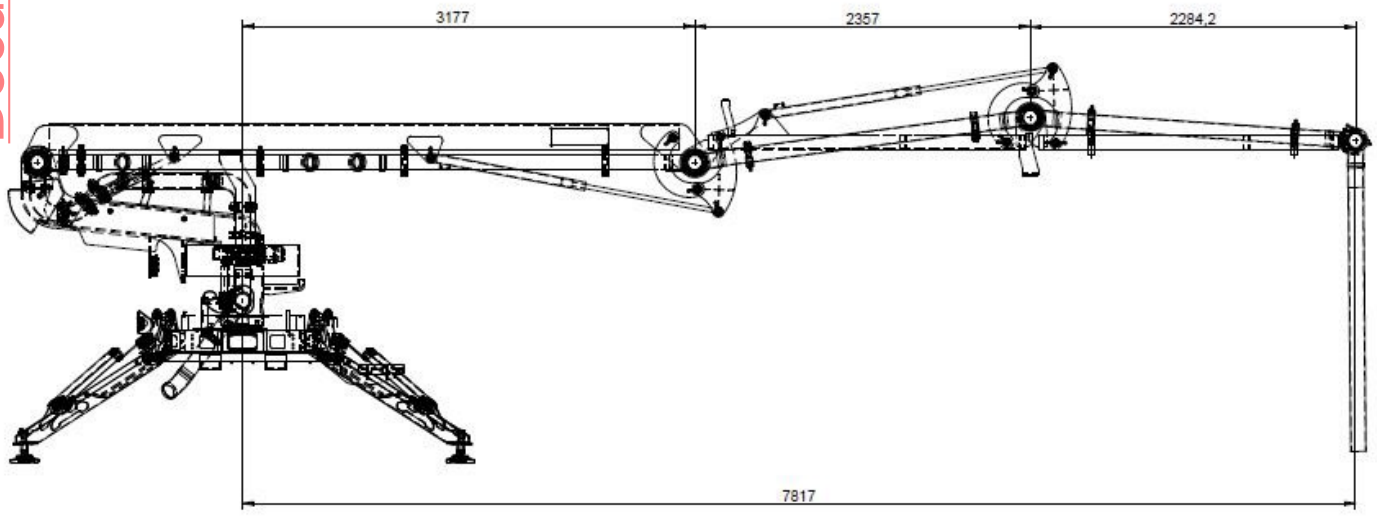

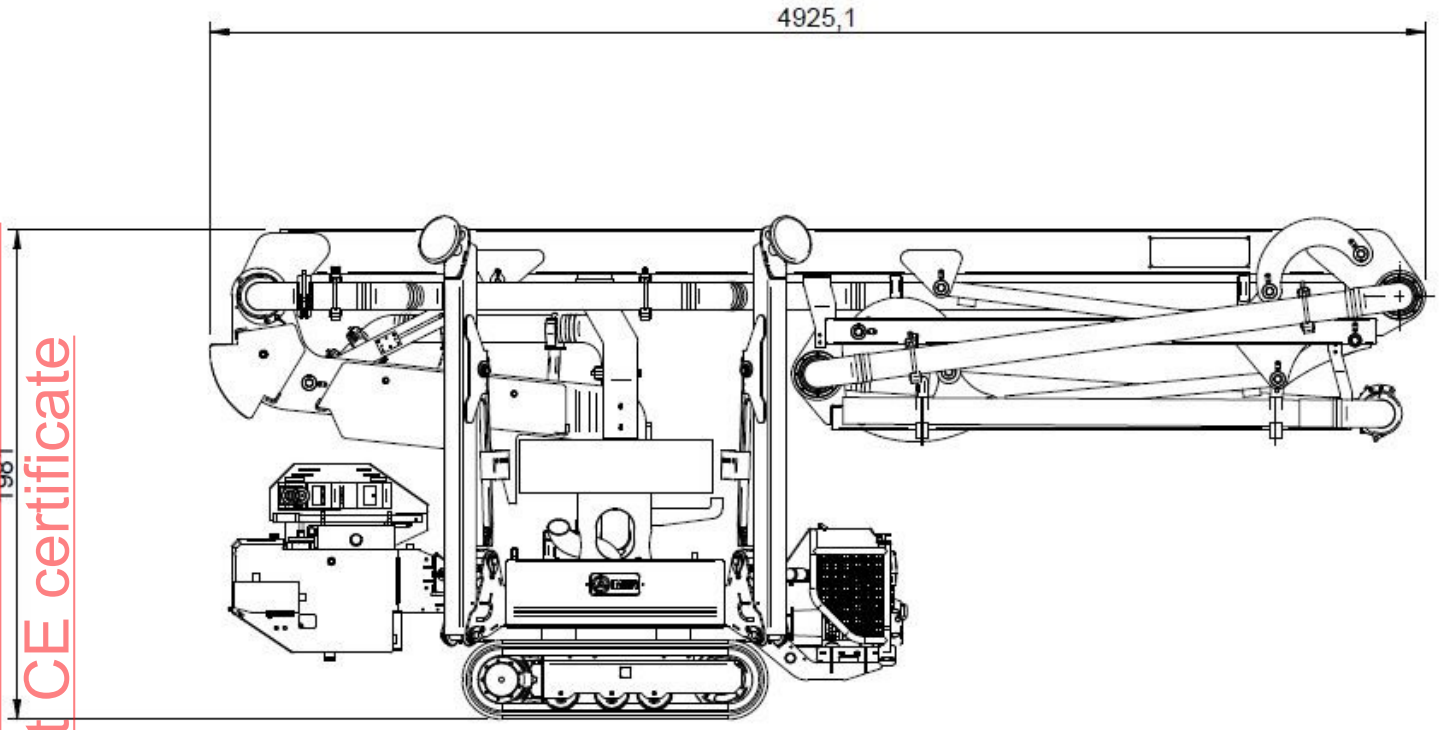

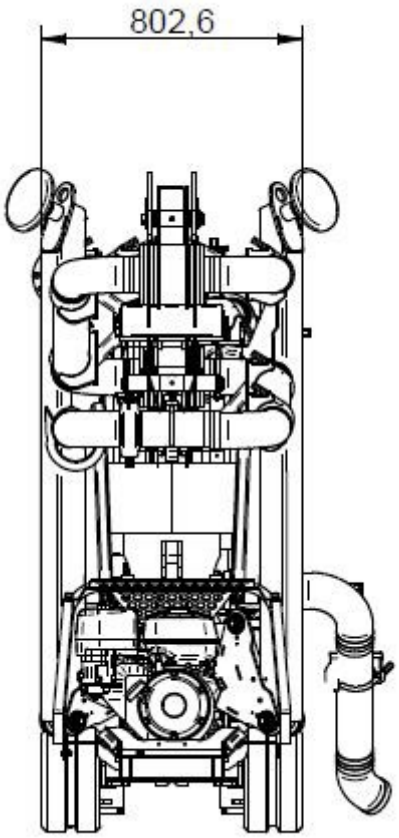

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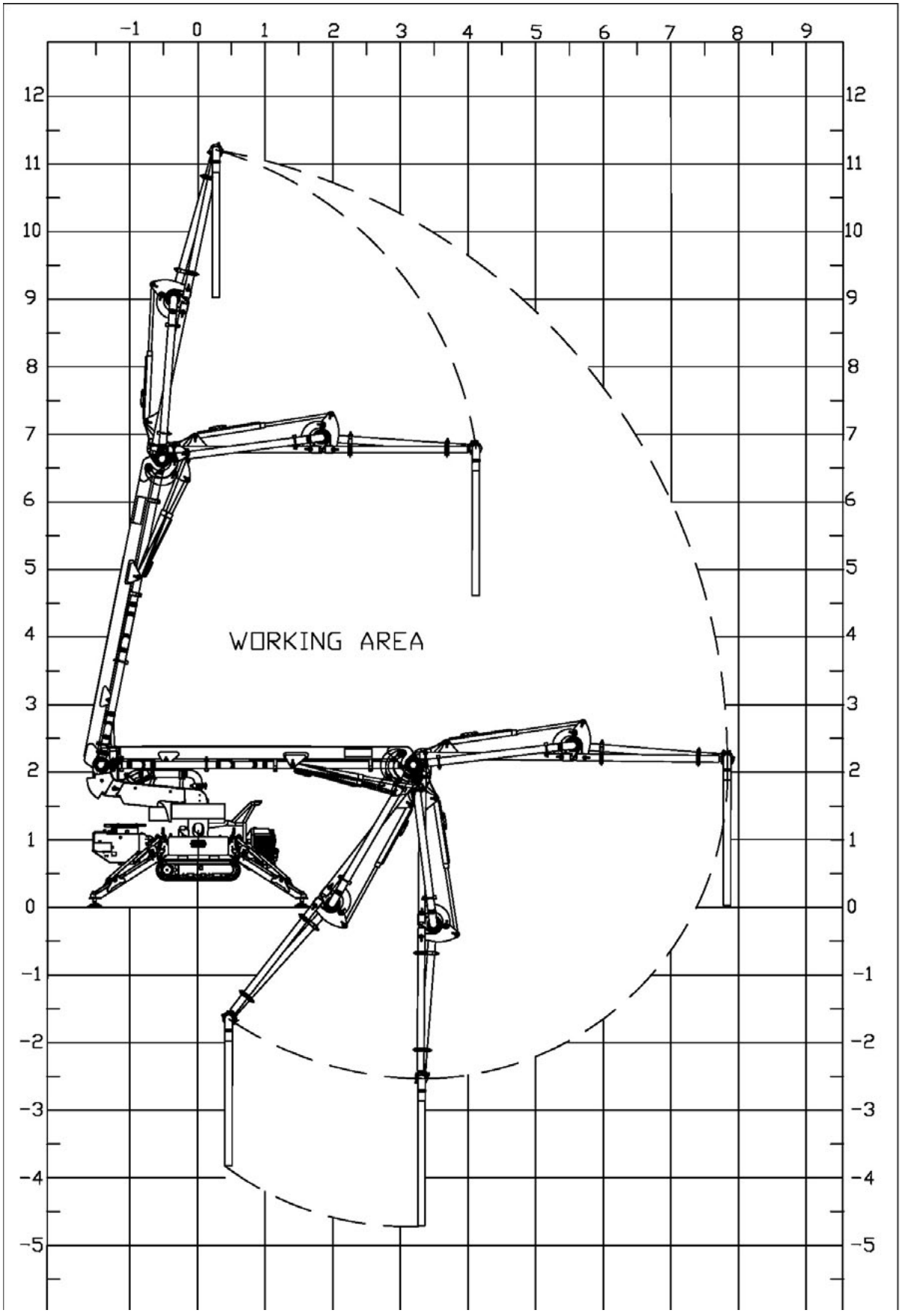
Work diagram



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Plates and stickers

Check with the figures for the presence of all plates and stickers.

Stickers or plates that do not contain text have alphanumeric codes ending in XX, or 8-digit numeric codes.

Stickers or plates containing text have an alphanumeric code ending with the initials of the country of destination of the machine.

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3237323	MADE IN ITALY	1
82021098	YELLOW/BLACK BANDS (H70)	12
A00001XX	CE	1
A00110XX	BATTERY CHARGER SOCKET	1
A00145XX	DOCUMENT BOX	1
A00148XX	MAX STABILIS. LOAD	4
A00150XX	CRUSHING HAZARD	4
A00174XX	OIL TYPE ISO VG 46	1
A00190XX	LIFTING HOOKS	4
A00296XX	DISTANCE BETWEEN POWER LINES	1
A00322XX	WHITE LOGO	4
A00353XX	HAND CRUSHING HAZARD	7
A00357XX	TURRET ALIGNMENT	2
A00361XX	HYDRAULIC BLOCK LETTERS	1
A00362XX	SERIAL CABLE	1
A00363XX	TRANSPORT ROPE	4
A00364XX	MAGNETOTHERMIC	1
A00380XX	DIRECTION ARROW	2
A00517XX	GERRIS 800 (LARGE)	2
A00518XX	GERRIS 800 (SMALL)	2
A00508XX	HANDLING BLOCK B	1
A00509XX	MAIN BLOCK A	1
A00536XX	HANDLING BLOCK C	1

A00289XX	SOUND POWER (P VERSION)	1

A00033GB	EMERGENCY	1
A00034GB	EMERGENCY PUMP	1
A00103GB	PROHIBITION OF ACCESS	6
A00383EN	REMOVE THE KEY	1
A00537GB	REGISTRATION PLATE	1

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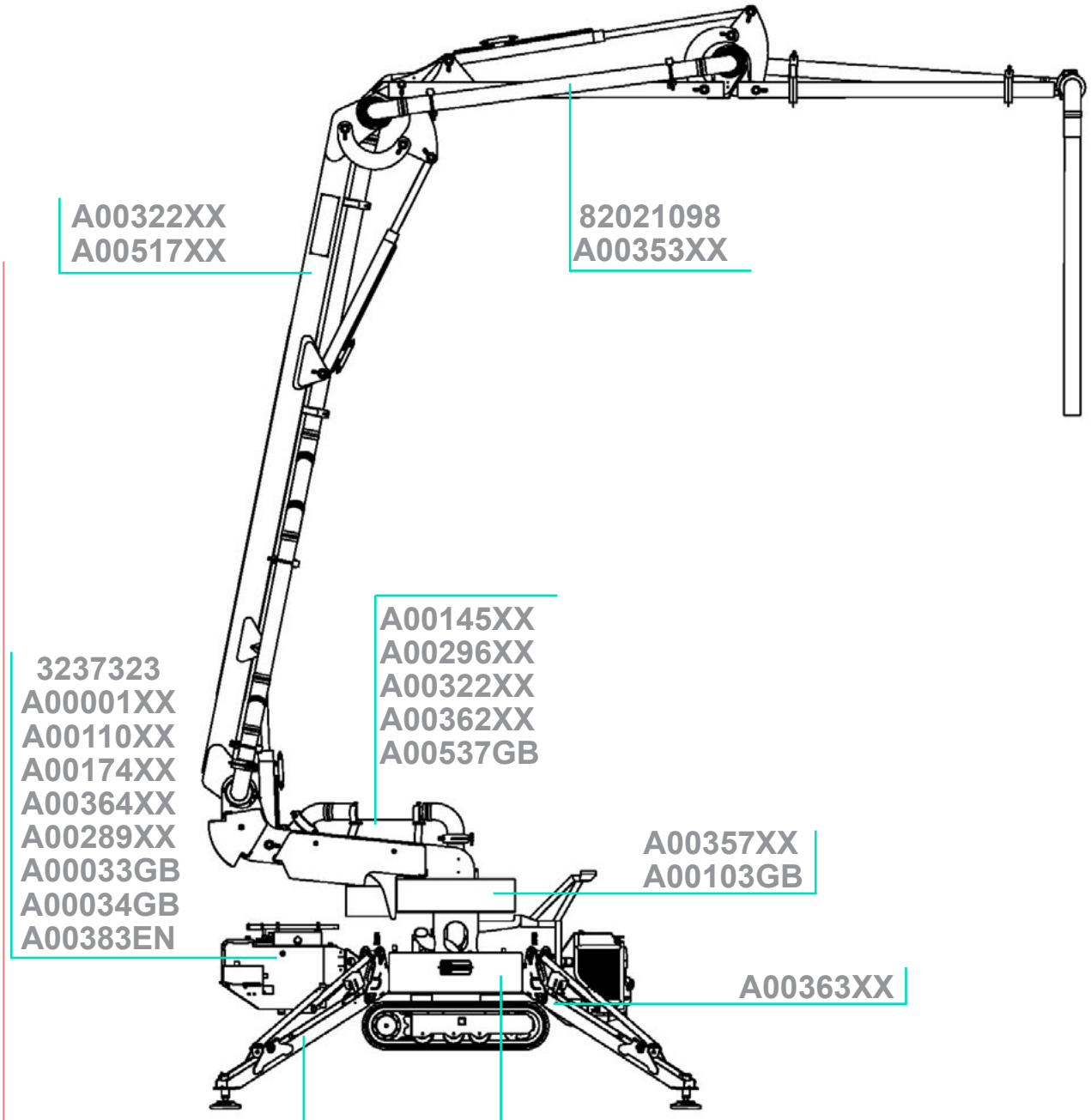

Identification

An engraved metal plate affixed to the turret bear all the information needed to identify the machine.

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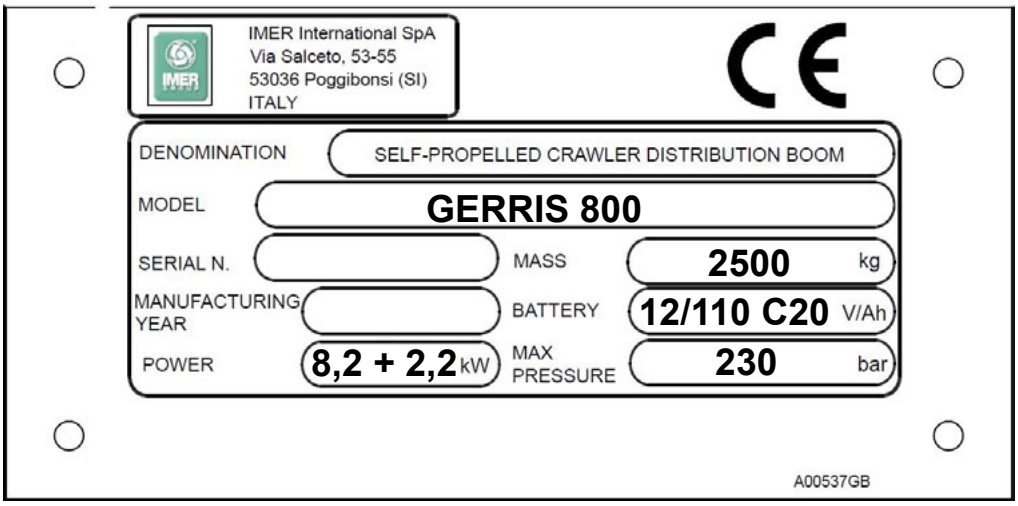

The data refers to the standard version

Standard set-up

- Proportional and simultaneous movements
- 4 “ piping kit
- Wireless radio control
- 230V - 16A electric pump for use from the mains
- Dual-speed engines
- Negative parking brakes
- Rubber tracks
- Hydraulically extendible tracks
- 355° turret rotation
- Automatic stabilisation
- Locking valves on cylinders
- Manual emergency descent
- Double controls from the ground and from the push-button panel
- Hour counter
- Motion audible warning device
- Battery disconnect plug
- Socket, plug and life saver for 230 V line
- CE–EN280 marking
- Traction enabling kit with open machine

Optional

- No marking tracks kit
- 12 V emergency electric pump
- Imerview kit
- Special plates kit (d.350)
- 2 “ piping kit

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Machine movements

Ground movements - Aerial movements

The movements refer to two parts of the machine: the ground part and the aerial part.

The ground part consists of the carriage (with tracks and stabilisers).

The ground movements are:

- machine traction and steering;
- opening and closing of the tracks;
- stabilisation.

The aerial part consists of the lifting system.

The movements of the aerial part are:

- lifting / lowering of the main boom;
- turret rotation;
- opening / closing of the second boom;
- opening / closing of the third boom.

Depending on the positions that the machine can have (see MACHINE STATUS), ground and/or aerial movements can be performed.

Aerial moves are not allowed if traction with open machine is enabled.

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Ground movements

Traction and steering

To perform traction the base carriage is fitted with two hydraulic motors that move rubber tracks. Steering is achieved by moving the tracks at different speeds.

Track widening

Widening of the tracks makes it possible to obtain greater stability when moving on site or in areas that are difficult to access.

The movement is driven by a hydraulic cylinder located inside the carriage.

Stabilisation

Stabilisation takes place via 4 hydraulic cylinders.

It can be automatic or manual.

Automatic

In addition to the simultaneous lowering of the stabilisers, automatic stabilisation also provides for the levelling of the machine with a tolerance of less than 1° (with an error of ± 0.1°).

Manual

Each stabiliser is lowered or raised individually.

Failure to level is a non-optimal condition; however, the machine's electronic system does not block any movements, since the conditions are in any case safe, up to the 2° threshold (in this case, the movements are blocked - see the paragraph ‘Carriage tilt control’). The operator can decide whether to continue using the machine or to stabilise it (bringing it within 1° of inclination).

If the machine is not properly levelled, its stability is compromised, creating risks for the operator and for any persons working near the machine.

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Aerial movements

Lifting / lowering of the main boom

The movement is driven by a hydraulic cylinder located between the turret and the boom.

Turret rotation

The movement is driven by a hydraulic engine that moves a fifth wheel located on the column. The turret rotates by 355°.

Opening / closing of the second boom

The movement is driven by a hydraulic cylinder located between the main boom and the first spreader beam.

Opening / closing of the third boom

The movement is driven by a hydraulic cylinder located between the frame of the second boom and the second spreader beam.

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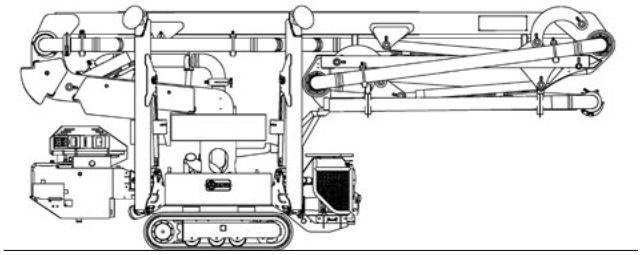
Machine status

Terms are used in this manual to indicate the status or position of the machine, according to which different movements can be performed.

Each machine status is displayed on the push-button panel display.

Machine stowed away

The machine is STOWED AWAY when the distribution boom is resting on the carriage support and none of the stabilisers are resting.



The machine stowed away allows:

- MOVEMENT of the machine by traction and steering;
- STABILISATION of the machine.

The machine stowed away is the only position that allows the stabilisers to move.

The machine stowed away is the position in which the machine must be found at the beginning and end of work.

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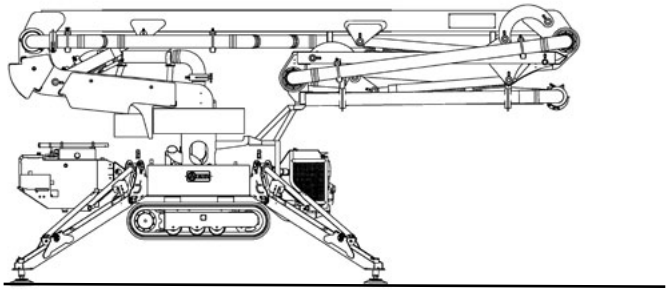
Machine stabilised and stowed away

The machine is STABILISED AND STOWED AWAY when all 4 stabilisers are resting, the turret is aligned and the distribution boom is resting on the carriage support.

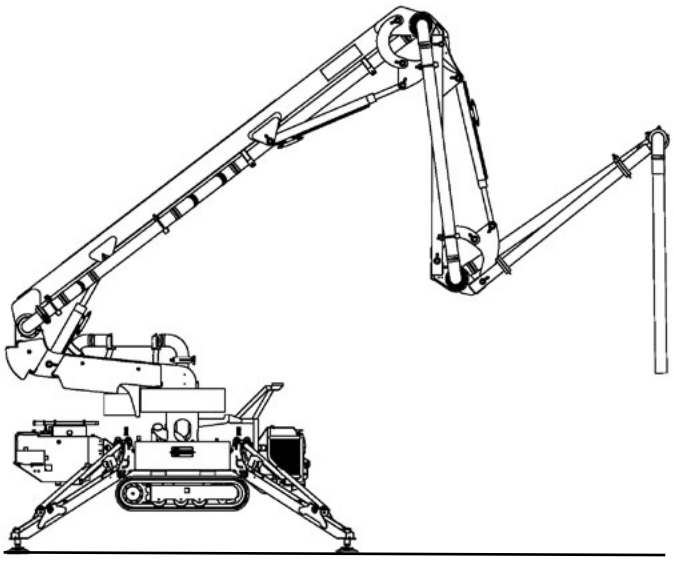


The MACHINE STABILISED AND STOWED AWAY status is used to:

- start opening the lifting system by lifting the main boom at the start of work;
- return to the machine STOWED AWAY status by lifting the stabilisers at the end of work.

Machine open

The machine is considered OPEN when the aerial part is activated from the STABILISED AND STOWED AWAY status.



From the MACHINE OPEN position, all the movements of the aerial part can be carried out except those concerning the second and third booms (for the latter, the main boom must have been raised by 10° with respect to the fifth wheel plane first).

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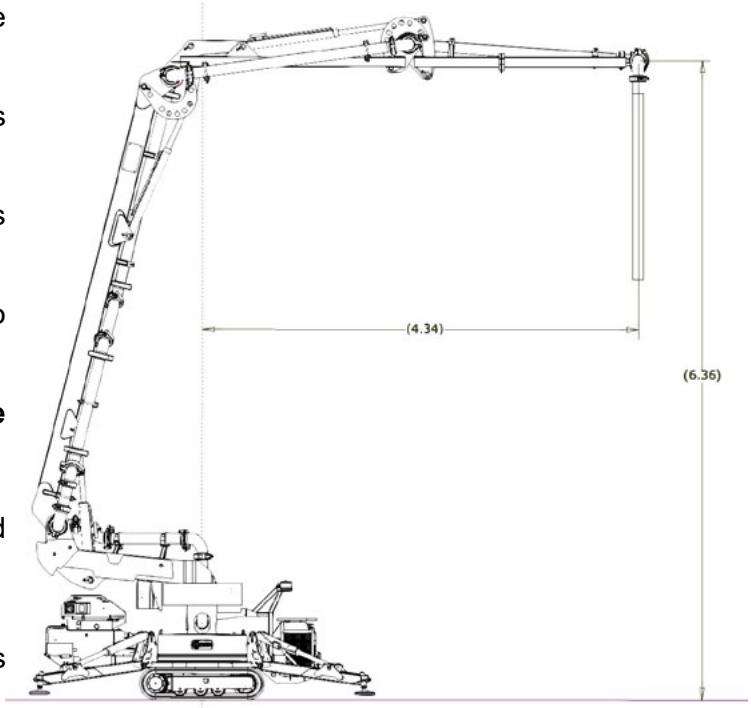
Enabling traction with open machine

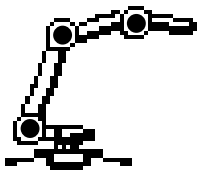
The **traction enabling kit** allows the translation of the open machine in compliance with the following constraints at the same time:

- **main lifting arm open** according to the dimensions in the figure;
- **second arm open** according to the dimensions in the figure;
- **third arm open** according to the dimensions in the figure;
- **turret rotated** maximum ±90° with respect to the axis of the hospitalized arm;
- **base wagon inclined max ±3° (otherwise the icon is displayed**).



The correct opening of the three arms is indicated by the filling of the dots in the icon .

Once all items are placed, the follow icon is displayed:



From this position the machine allows the raising of the stabilizers. The stabilizers are distanced from the ground for a sufficient distance to allow traction in safety (icon **OK**). **Aerial movements are blocked**. In case of contact of one or more stabilizers with the ground, traction will be interrupted.

In traction mode with the machine open it **is allowed**:

- move the machine at a safe speed in all directions;
- stabilize the machine, returning to the open machine state.

Traction mode with open machine **is not permitted** in case of:

- opening of one of the three arms at angles other than those allowed;
- turret rotation beyond ±90°;
- undercarriage inclination over ±3°;
- contact of one or more stabilizers with the ground.

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Safety systems

Safety devices are provided on the machine that block normal operation to prevent damage to property or persons.

Knowledge of the characteristics and operation of the safety devices are essential; it is therefore advisable not to operate the machine without first reading and assimilating the following section.

As, depending on the positions that the machine can assume, the safety devices are activated or not, it is important to be familiar with the CONFIGURATION and the meaning of the MACHINE STATUS illustrated in the previous pages.

Failure to operate a safety device, caused by a fault or by tampering, can cause serious damage to the machine and consequently endanger the life of the operator.

Periodically check the safety devices as described in the manual.

The safety devices must never be tampered with. The manufacturer declines all responsibility for accidents attributable to interventions and tampering with the same.

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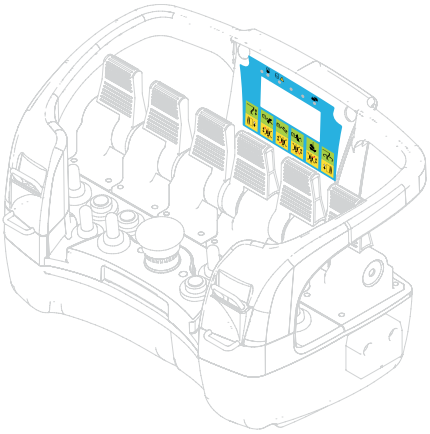
Anomalies

In the event of a malfunction detected by the self-diagnosis of the main machine control units, an error code will be displayed on the push-button panel display.



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Audible signals

Abnormal condition: it is signalled by an intermittent high-frequency sound. All or part of the machine movements are blocked until the machine is returned to safe operating conditions.

Normal operation: any movement of the machine is signalled by an intermittent low frequency sound.

Thermal relay

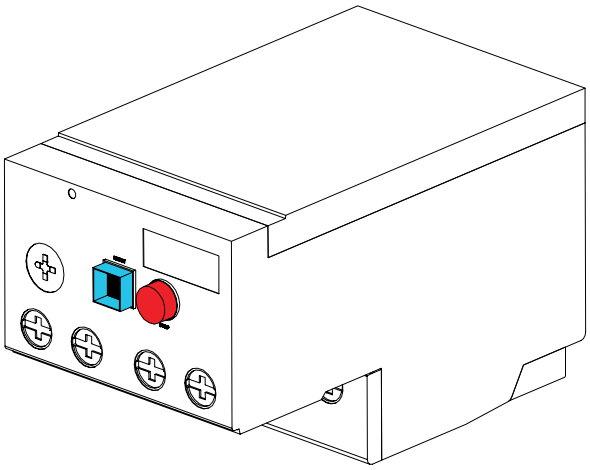
The thermal relay protects the electric motor from any current overloads.

It is positioned in the tank housing, inside the protective box.

In the presence of an overload, the thermal relay interrupts the supply circuit to the motor.

After checking and eliminating the cause of overload, to reset the motor press the blue relay reset key.

The red key is used to perform the relay test (see “Electric motor maintenance”).



Sensor oil filter clogged

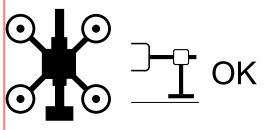
It consists of a sensor on the oil filter of the hydraulic circuit.
If the filter is blocked, all movements are slowed to 40% of the maximum permitted.

Tilt sensor and spirit level

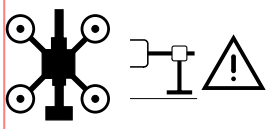
Remember that the maximum inclination of the carriage is 1 degree.

There are two devices used to control the inclination of the machine: **the tilt sensor** and **the spirit level**.

The tilt sensor is integrated into the self-levelling system, it is an angle sensor that, located at the front of the carriage, detects its angle. The following icons appear on the display:

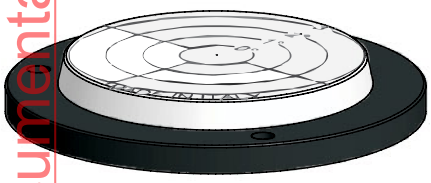


- the carriage is levelled with respect to zero with an error of ± 0.1°;



- the carriage is inclined by more than 1°.

Automatic levelling is an electronic aid that greatly increases ease of use of the machine. It is however necessary to ALWAYS check during and after the levelling phase correct inclination of the machine by means of the spirit level.



The spirit level is positioned at the front of the carriage.

During the levelling phase of the machine, use the spirit level to check that the permissible inclination limit of 1° is respected.

Always check the correct inclination of the machine after each levelling operation.

If the machine is not properly levelled, its stability is compromised, creating risks for the operator and for any persons working near the machine.

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Microswitches

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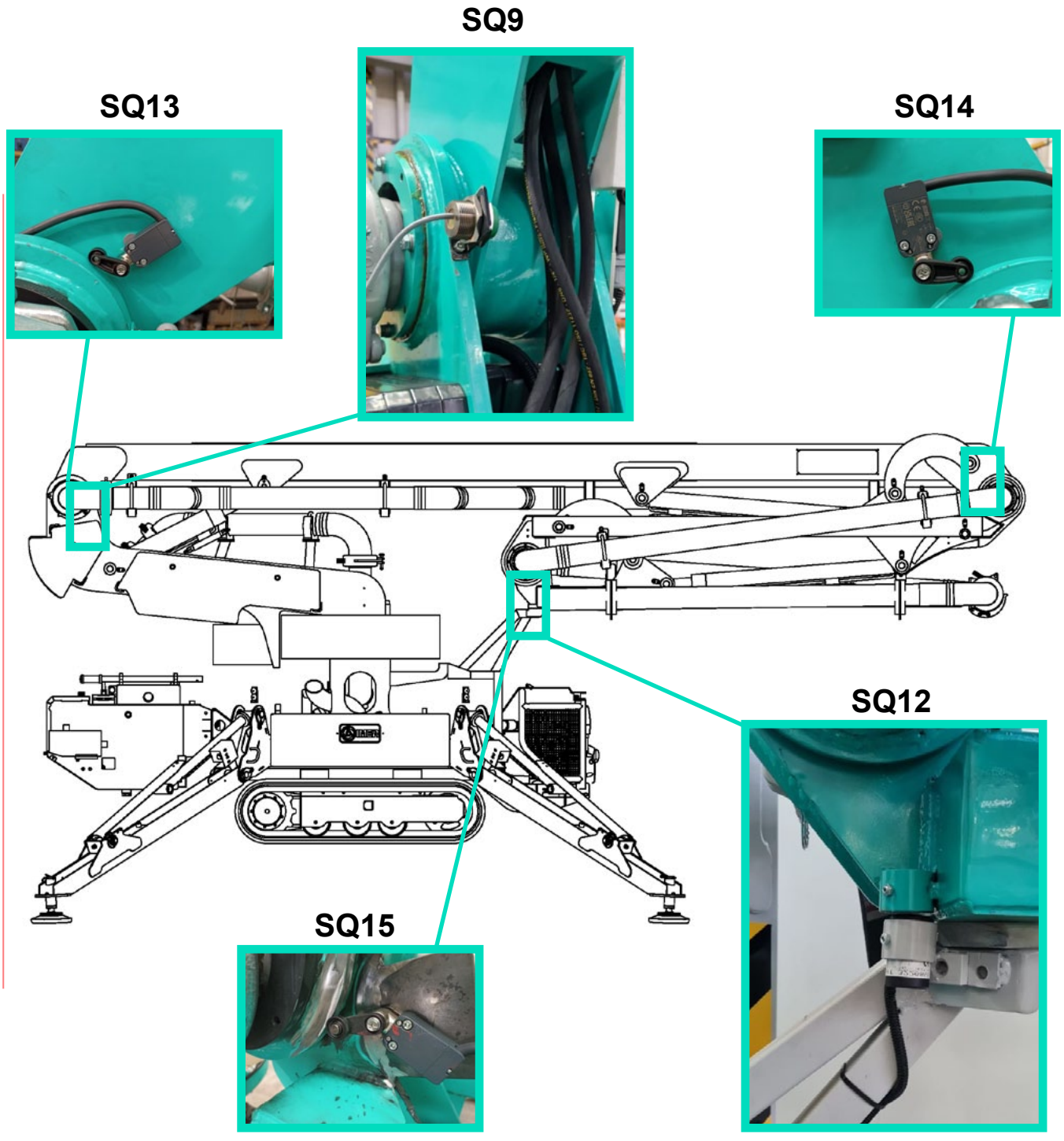


Microswitch SQ12 (stowed away)

SQ12 is a magnet located at the base of the boom support on the carriage: the approach of the distribution boom verifies its correct closure.

With the MACHINE STOWED AWAY (distribution boom in place) ***it is possible to:***

- perform traction movements at all speeds;
- lower and/or lift the stabilisers.

With the MACHINE STABILISED AND STOWED AWAY ***it is possible to:***

- lift the main boom.

After this, the turret can be rotated.

Microswitch SQ9 (activation of second and third booms)

SQ9 is a magnet located on the hinge between the main boom and the turret and it detects the threshold of the inclination required for the activation of the second and third booms.

With the MAIN BOOM tilted LESS than 10° with respect to the fifth wheel plane ***it is possible to:***

- perform the aerial movements of the main boom and of the turret.

It is NOT possible to:

- perform the aerial movements of the second and third booms.

With the MAIN BOOM tilted MORE than 10° with respect to the fifth wheel plane ***it is possible to:***

- perform all aerial movements.

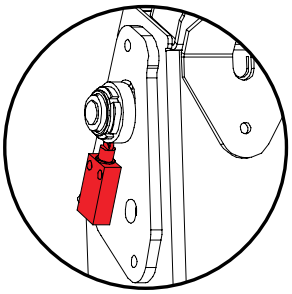
Microswitches SQ13-14-15

SQ13 SQ14 SQ15 are placed near the articulations of the lifting arms.

They control the positioning of the arms in order to enable traction with the machine open.

- When all three microswitches are in the correct position (indicated on the display) it is possible to enable traction with the machine open.
- If one of the three arms goes out of the allowed angles, traction is disabled.

Microswitches SQ3-4-5-6



SQ3 SQ4 SQ5 SQ6 are located near the rod fixing pin of the stabiliser cylinders.

Check the pressure setting of the stabilisers.

- When even one single stabiliser is resting on the ground, traction is blocked.
- If all 4 stabilisers are resting on the ground, it is possible to move the aerial part.
- If TRACTION WITH THE MACHINE OPEN is enabled, the contact of one or more stabilizers with the ground blocks the traction.

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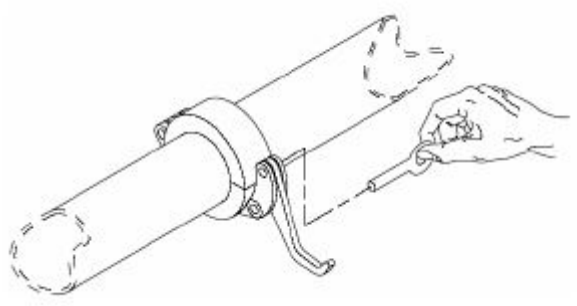
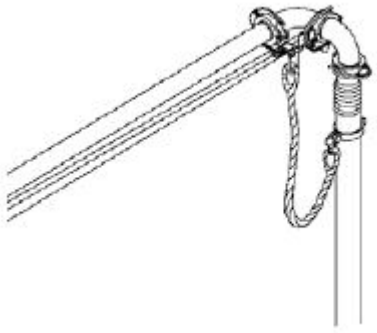
Lever coupling safety pins

The lever couplings of the concrete pipes are closed and locked using the appropriate pin.



Rubber end hose anchoring safety cable

The rubber end hose is anchored to the last element of the boom by means of the special safety cable.



Turret encoder

An encoder is an electronic device connected to the main control unit via CANbus. It allows the accurate position of the turret to be detected by means of the rotation angle.

This device makes it possible to:

- detect the centring position for correct stowing;
- confirm the position of the turret to enable traction with the machine open.

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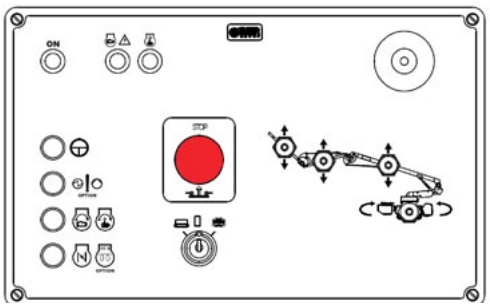
Emergency devices

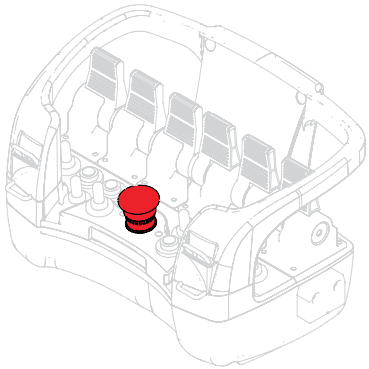
Emergency devices are provided on the machine.

Knowledge of the characteristics and operation of the emergencies is essential; it is therefore advisable not to operate the machine without first reading and assimilating the following section.

Emergency stop

The emergency mushroom button is located on the ground control panel and on the push-button panel.

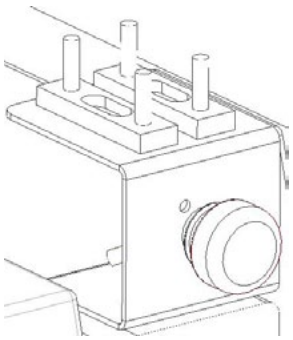




Pressing one or both buttons blocks all movements, allowing any machine function to stop immediately in emergency situations.

To restore normal functions, turn the button clockwise.

Battery cut-off switch



The battery cut-off switch is located in the front box (tank area).

This safety device interrupts the power and control circuits from the batteries, blocking all movements.

It must be operated in case of prolonged shutdown of the machine or for maintenance work on the electrical equipment.

Solenoid valves for emergency movements

The hydraulic blocks on the machine are equipped with solenoid valves used for emergency movements.

Reference should be made to the paragraph “Manual emergency procedures”.

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Hand pump

The hand pump is positioned on the left side of the oil tank, while the lever to operate it is positioned above it.

The hand pump is used to send oil under pressure to perform manoeuvres in emergency situations or failure.

Reference should be made to the paragraph “Manual emergency procedures”.

12 V electric pump (optional)

The electric pump is located under the oil tank.

The electric pump is used to send oil under pressure to perform manoeuvres in emergency situations or failure.

Reference should be made to the paragraph “Manual emergency procedures”.

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Control points

The control points provided for the operator are:

- push-button panel used on the ground;
- ground control panel.

Using the push-button panel excludes the ground control panel and vice-versa.

The ground control panel is mainly used in emergency situations or during maintenance. Traction, steering and stabilisation cannot be performed from the ground control panel.

In versions with radio control, the push-button panel must always be switched on, even if the ground panel controls are being used.

The machine movements are:

- Traction (forward and backward movement)
- Steering
- Track widening
- Stabilisation
- Lifting / lowering of the main boom
- Turret rotation
- Opening / closing of the second boom
- Opening / closing of the third boom

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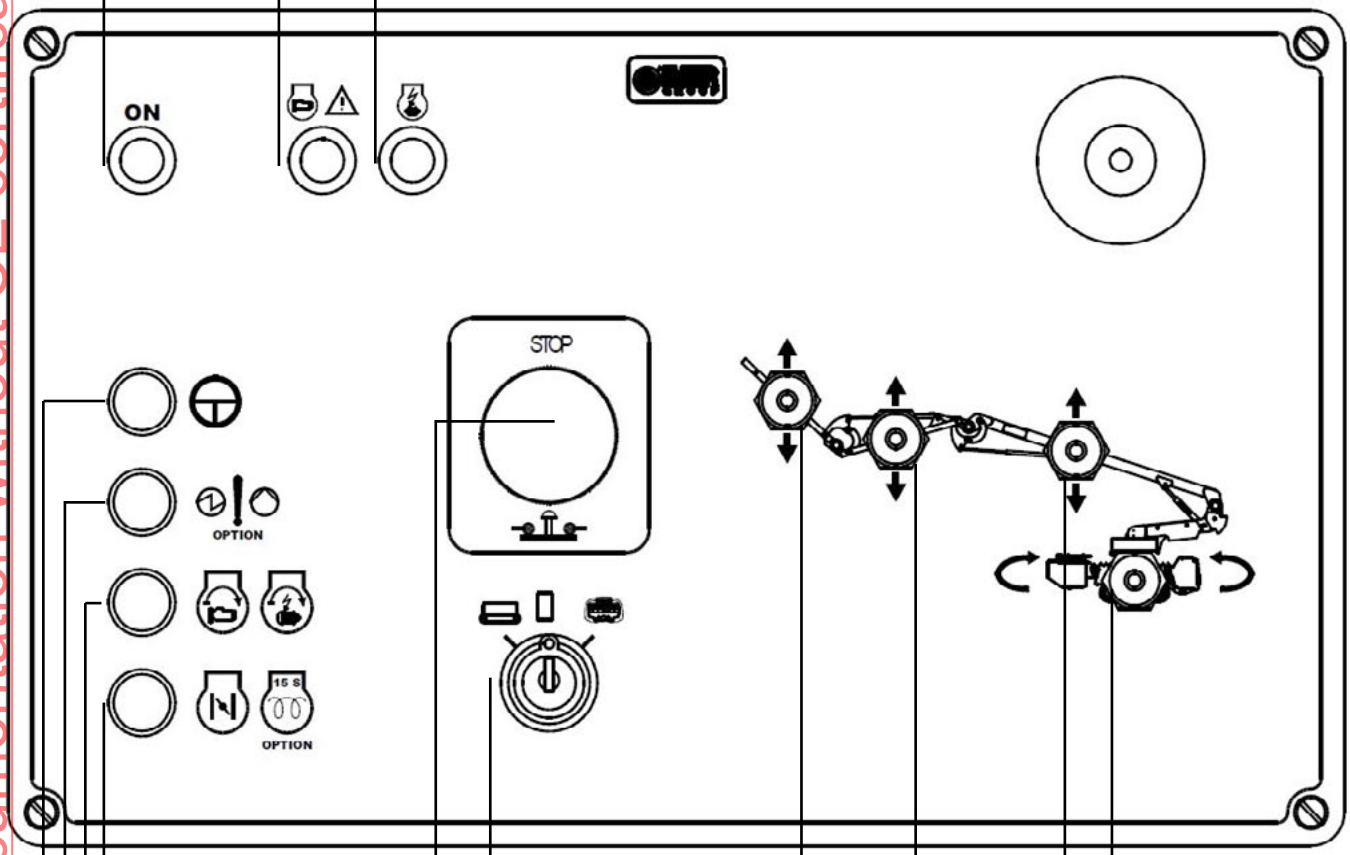
Control panels

Ground control panel



11 Machine luminous light on (green)

12 Red light (A)

13 Green light (B)

6 Air (petrol engine)

5 Start

4 Emergency electric pump (optional)

3 Dead-man

1 Key selector (3 positions)

2 Red emergency stop button

7 **Turret** rotation

8 **Main boom** lifting/lowering

9 **Second boom** opening/closing

10 **Third boom** opening/closing

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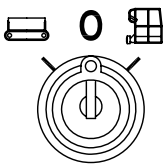
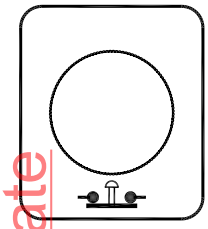


1 - Key switch (3 positions)

- Position in the centre: the machine is off.
- Position on the right: the push-button panel controls are active.
- Position on the left: the controls from the ground panel are active.



2 - Red emergency stop button

- Pressed, it stops all machine functions.
- Released, it allows the machine to operate.

3 - Dead-man

Each movement of the aerial part by means of selectors 7 to 10 is carried out only by holding down button 3 which has the function of dead-man.

4 - Emergency electric pump

Emergency electric pump on (optional).

5 - Start

Combustion engine ignition (petrol). If the machine is connected to the mains voltage, the electric motor starts.

6 - Air (petrol engine)

It makes it easier to start the engine if it is cold.

- Petrol engine: keep pressed simultaneously with button 5 to activate the engine air.

7....10 - Aerial movement selectors

With selectors 7 - 8 - 9 - 10 and button 3 dead-man, the movements of the aerial part are performed.

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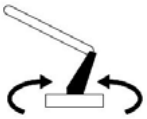
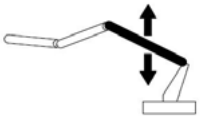


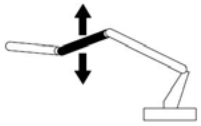
7 - Turret rotation

- Move selector 7 to the right to turn the turret anti-clockwise.
- Move selector 7 to the left to turn the turret clockwise.



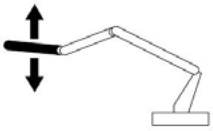
8 - Lifting / lowering of the main boom

- Move selector 8 up to lift the main boom.
- Move selector 8 down to lower the main boom.



9 - Opening / closing of the second boom

- Move selector 9 up to open the second boom.
- Move selector 9 down to close the second boom.



10 - Opening / closing of the third boom

- Move selector 10 up to close the third boom.
- Move selector 10 down to open the third boom.

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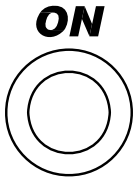
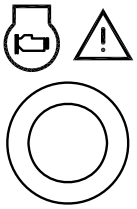


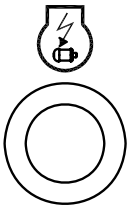
11 - Machine light on

The green light 11 lights up when the selector 1 is not in the central position.



12 - Mains voltage disconnected light

If the red light 12 is on the mains voltage is disconnected. When the combustion engine is switched on, the light goes off.



13 - Mains voltage connected light

If the red light 13 is on, the mains voltage is connected. The electric motor can be used.

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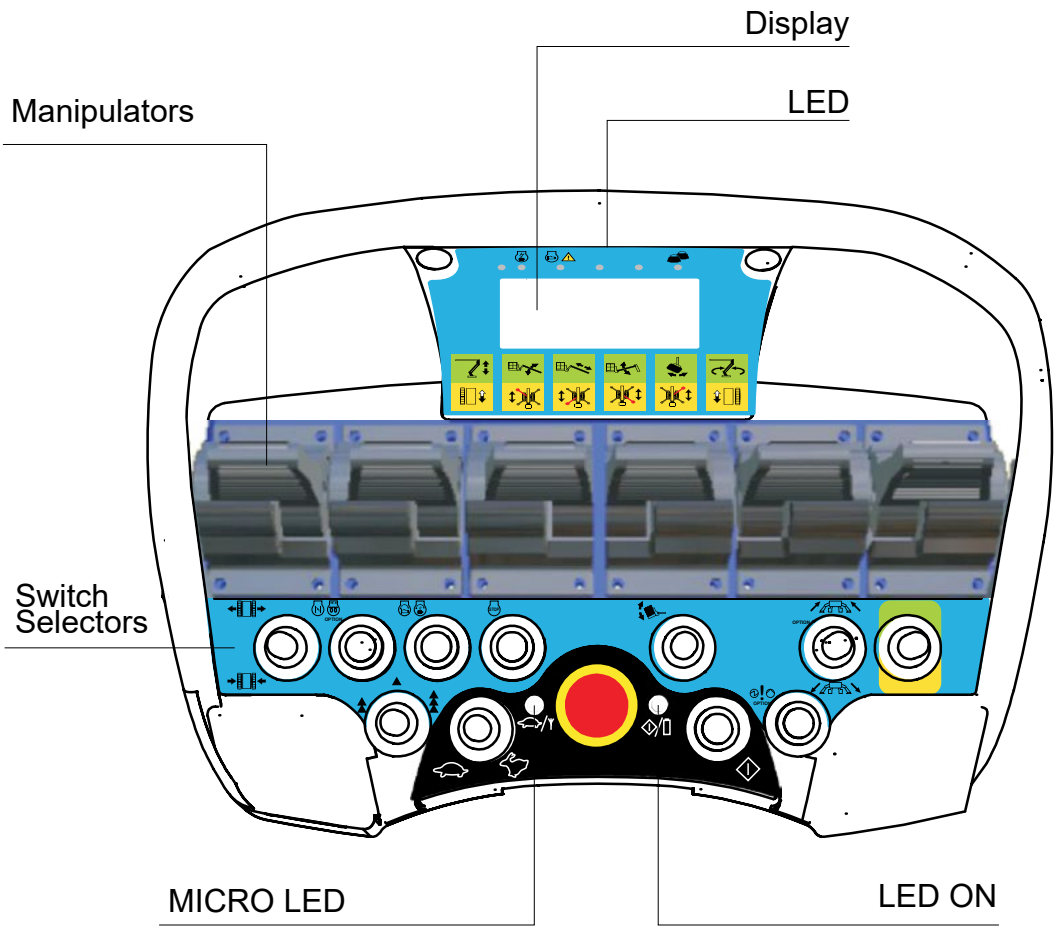
Push-button panel

Turn on the push-button panel with the switch and wait for the red ON LED to turn on.



The ON LEDs and MICRO LEDs indicate the operating status and alarms.

LED ON red on: the push-button panel is active and is transmitting via cable or radio.

LED ON red flashing once every second, radio control version only: the battery is running low. This indication is preceded by three acoustic signals from the internal buzzer.

MICRO LED red on: radio communication lost.

MICRO LED green off indicates that the HARE speed of the combustion engine is active.

MICRO LED green flashing indicates that the TORTOISE speed of the combustion engine is active.

Error code

The push-button panel performs a check on its parts each time it switches on and in case of anomalies it displays an error code, flashing the red LED ON and sounding the internal buzzer a certain number of times, depending on the type of error found. Refer to the push-button panel manual annexed to the machine.

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Selectors

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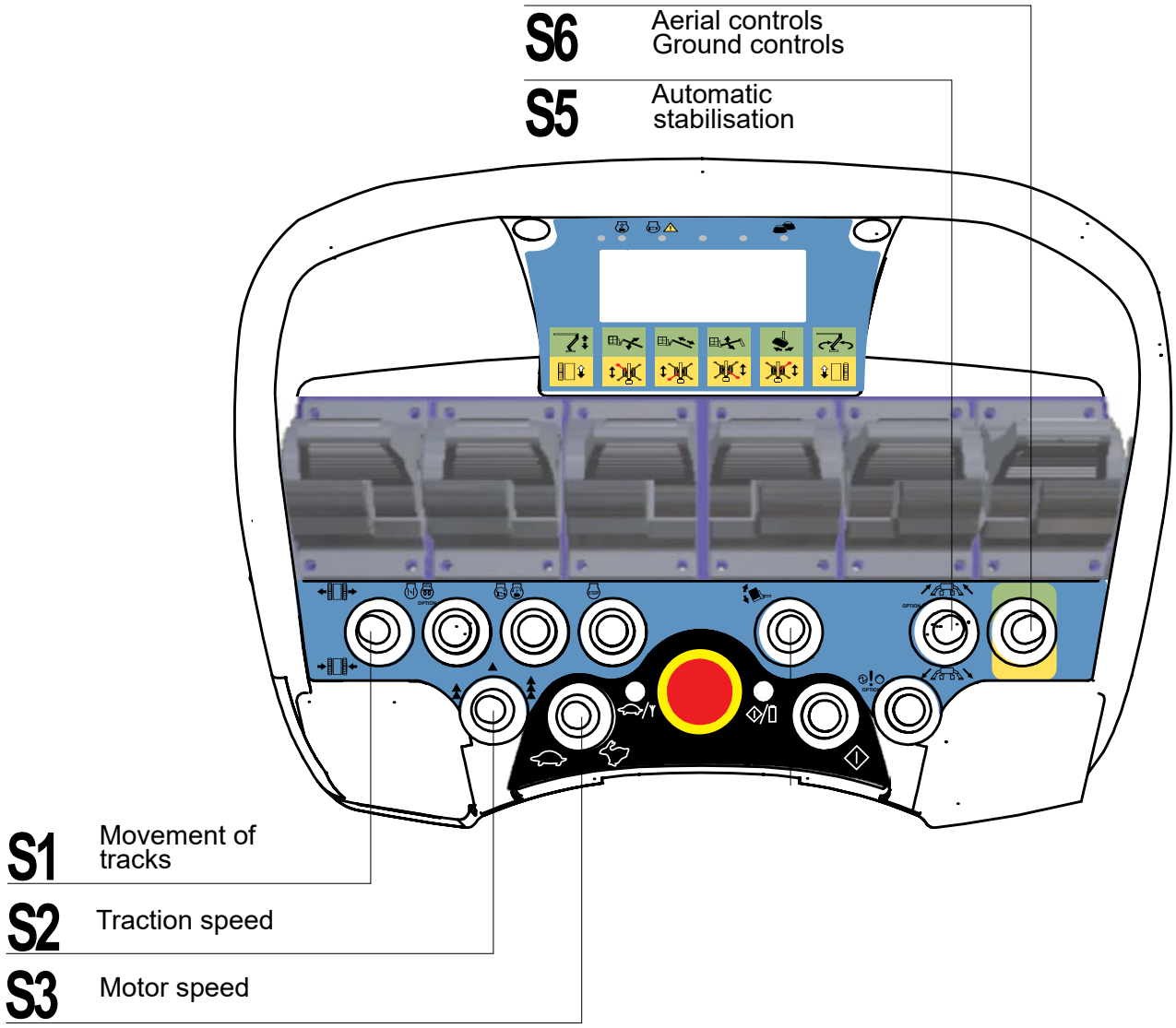
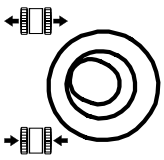


S1 - Movement of tracks



- Forward: widens the tracks.
- Backward: narrows the tracks.

Track widening is permitted when the machine is stowed away or stabilised.

S2 - Traction speed

- On the right: maximum speed.
- Centre and left: minimum speed.

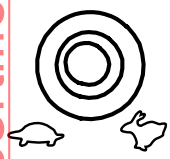
With use of petrol engine

The speed selection is active when the machine is stowed away.

With use of electric motor

Speed selection is not active, traction always takes place safely.

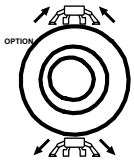
S3 - Combustion engine speed



- On the right: hare - higher number of revs.
- Left: tortoise - lower number of revs.

In some movements the engine uses the lowest rpm regardless of the position of S3.

S5 - Automatic stabilisation



- Forward: automatic destabilisation feet lifting.
- Backward: automatic stabilisation feet descent.

The necessary condition to perform the movement is the DISTRIBUTION BOOM HOUSED IN ITS SEAT.

The machine is levelled with a maximum error of 0.1° with respect to 0.

S6 - Movement selection

- Forward: the manipulators move the aerial part.
- Backward: the manipulators perform the traction, steering (M1-M6), ascent/descent movements of each individual stabiliser cylinder (M2-M3-M4-M5) for manual stabilisation.

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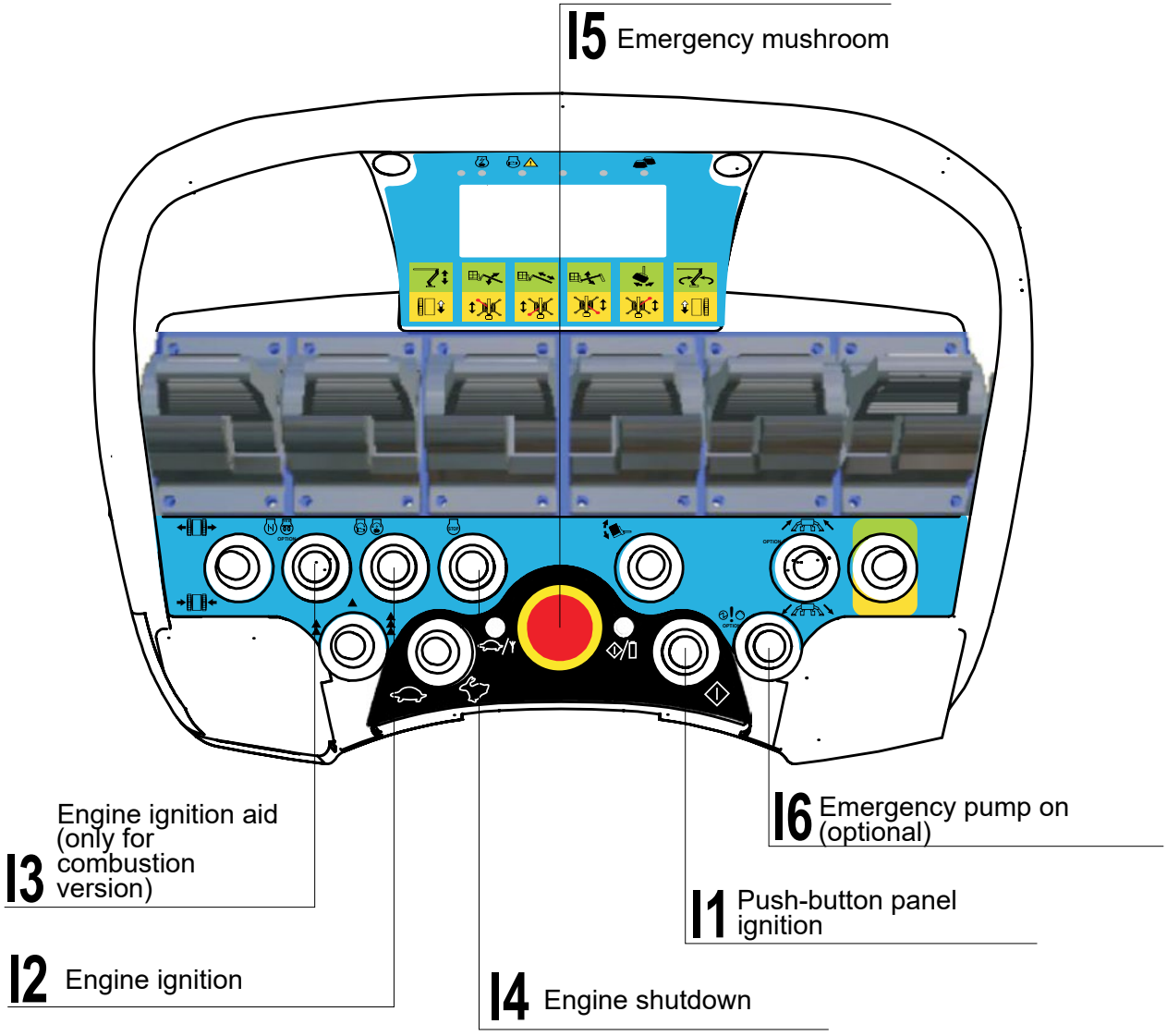
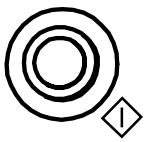
Switches



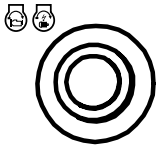
I1 - Push-button panel ignition



Switch I1 turns on the push-button panel.

Switch I5 is used to turn off the push-button panel.

I2 - Starting the electric or combustion engine



If the mains voltage is connected, the electric motor starts, if the mains voltage is not connected, the combustion engine starts.
To start the combustion engine cold see switch I3.

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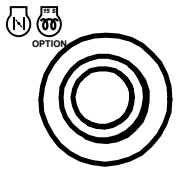
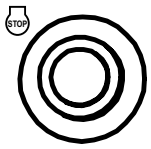
I3 - Engine ignition aid



It makes it easy to start the engine cold.

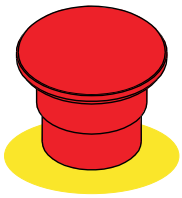
- **Petrol engine**: hold pressed simultaneously with I2 to activate the engine air.

I4 - Engine shutdown



It turns off the electric or combustion engine.

I5 - Emergency mushroom



If pressed, it locks the entire machine and turns off the push-button panel. To release, rotate it clockwise.

The push-button panel must be switched back on with I1.

I6 - Emergency pump on (optional)

It turns on the emergency electric pump (optional).

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Manipulators

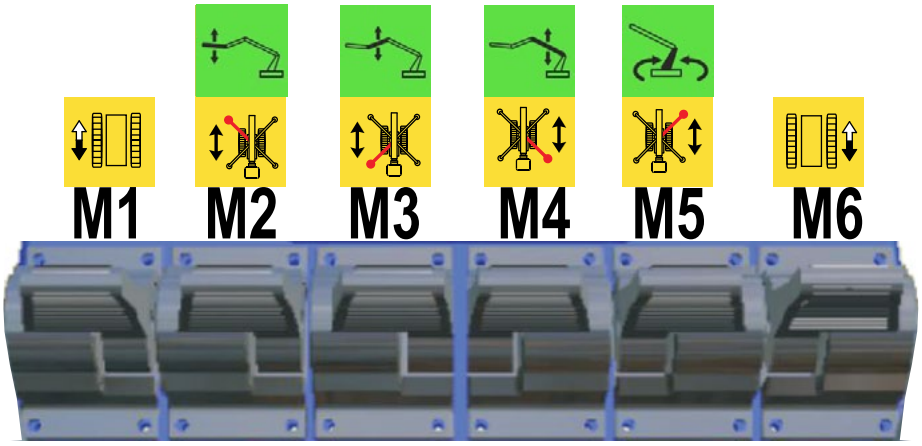

Table of manipulators operation according to the position of selector S6.

S6 forward Aerial part movements		
M1	No use	
M2 - THIRD BOOM	Forward	Closing
	Back	Opening
M3 - SECOND BOOM	Forward	Opening
	Back	Closing
M4 - MAIN BOOM	Forward	Ascent
	Back	Descent
M5 - TURRET ROTATION	Forward	Clockwise rotation
	Back	Anti-clockwise rotation
M6	No use	

S6 back Earth part movements		
M1 - LEFT TRACK	Forward	Forward
	Back	Back
M2 - STAB. FRONT LEFT	Forward	Ascent
	Back	Descent
M3 - STAB. REAR LEFT	Forward	Ascent
	Back	Descent
M4 - STAB. REAR RIGHT	Forward	Ascent
	Back	Descent
M5 - STAB. FRONT RIGHT	Forward	Ascent
	Back	Descent
M6 - RIGHT TRACK	Forward	Forward
	Back	Back

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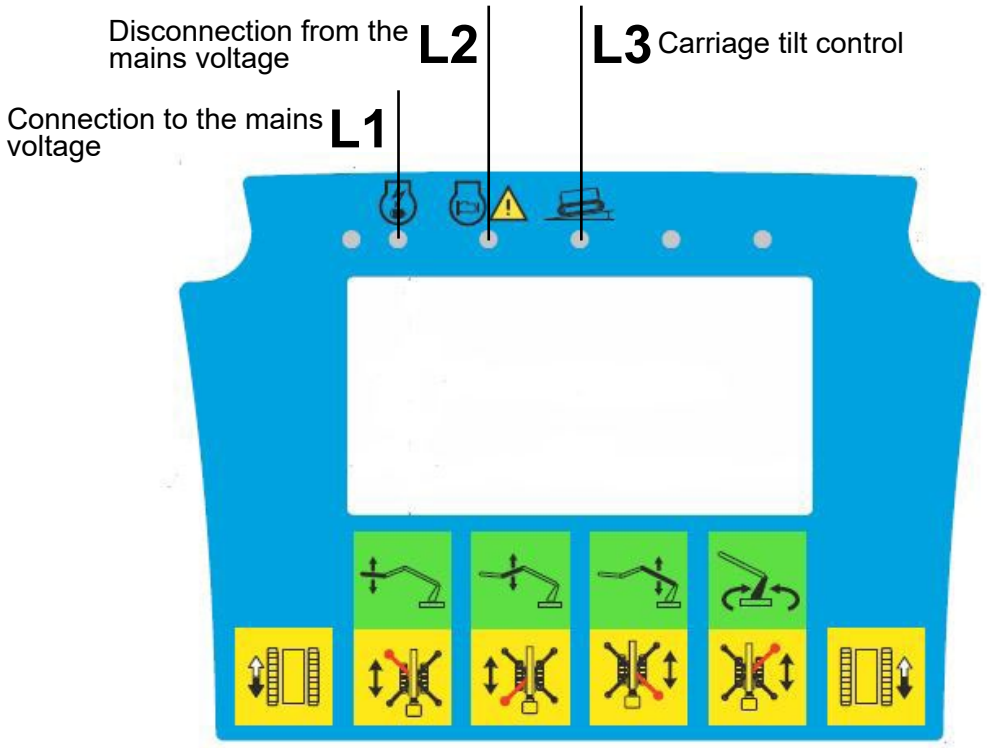
LED Bar

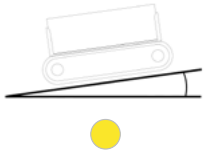


L1 - Connection to the mains voltage

Green light; if on the mains voltage is connected.

L2 - Disconnection from the mains voltage

Orange light; if on the mains voltage is disconnected. When the combustion engine is switched on, the light goes off.



L3 - Carriage tilt control

Orange light; it lights up, signalling a pre-alarm and then the alarm if the inclination of the carriage in translation or during work with the machine stabilised reaches the permitted limit values.

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Display

The display shows:

- Engine status
- Work thresholds
- Machine status

Engine status

Petrol combustion engine on

Oil in the engines

- Petrol engine: the oil level is too low.

Alternator and ignition battery status

- Off after start-up: the alternator works.
- Fixed on: the alternator is not working.
- With the engine off if it flashes it indicates that the starter battery is low.

Oil filter clogged

- The oil filter of the hydraulic circuit is clogged and must be replaced as soon as possible. All machine movements are slowed by 40% of the maximum permitted.

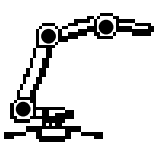
Work thresholds

Excessive tilt

- The icon signals, both during the translation phase (with the machine closed and with the machine open) and when the machine is stabilized, if the inclination thresholds are reached and exceeded.
- Machine closed, flashing icon: when the first threshold is reached (reduction of traction speed and destabilizing movements in the air phase).
- Machine closed, fixed icon: when the second threshold is reached.
- Open machine, fixed icon and warning triangle: when the traction block threshold is reached.

Turret centering

- The icon indicates that the turret centering has been reached (threshold for the correct storage of the machine).



Traction enable status with machine open

- The icon signals the activation of traction with the machine open (all positioning constraints are satisfied).

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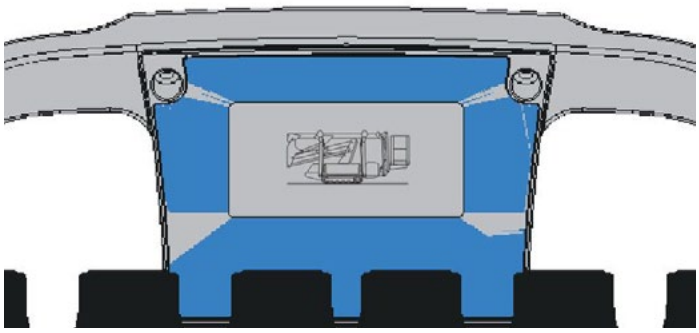
Machine status

The machine status is represented by the following icons

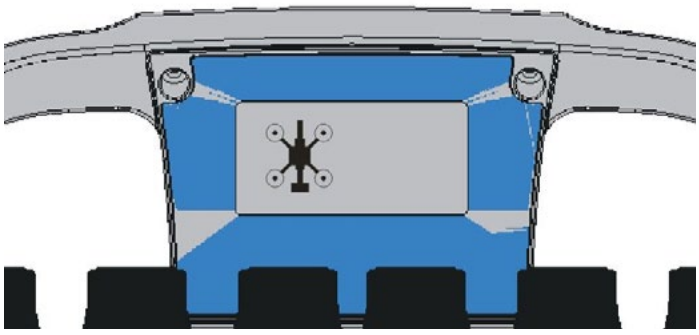
MACHINE STOWED AWAY

The machine is STOWED AWAY when the distribution boom is resting on the carriage support and none of the stabilisers are resting.



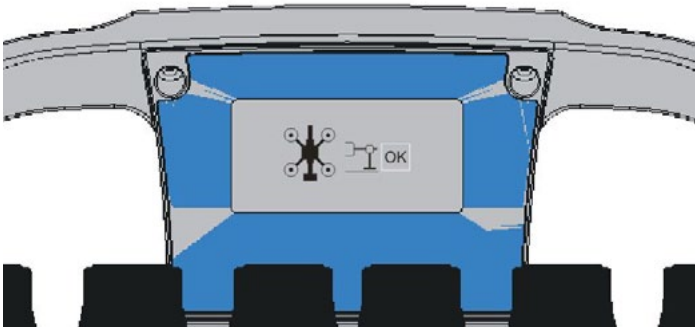
MACHINE STABILISED STOWED AWAY

The machine is STABILISED AND STOWED AWAY when all 4 stabilisers are resting, the turret is aligned and the distribution boom is resting on the carriage support.



MACHINE STABILISED STOWED AWAY AND LEVELLED

The machine is STABILISED STOWED AWAY AND LEVELLED when all 4 stabilisers are resting, the machine is levelled and the distribution boom is resting on the carriage support.



Visually check the actual levelling of the machine using the appropriate spirit level.

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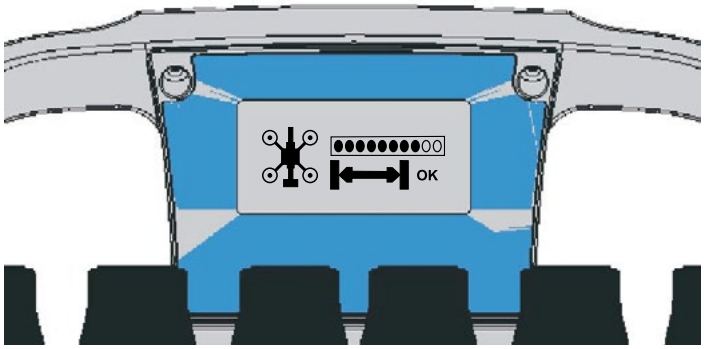
MACHINE OPEN

The machine is OPEN when all 4 stabilisers are resting on the ground and the machine is not stowed away.



If one of these icons appears on the display, the support of one or more stabilising feet has been lost.

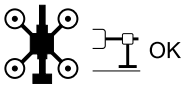
The machine is no longer stabilised.

Repeat the stabilisation step.

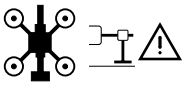
The machine IS STABILISED AND NO LONGER STOWED AWAY.

Movement of the stabilisers is blocked.

Lifting the main boom activates turret rotation; beyond 10° with respect to the fifth wheel plane, the movements of the second and third booms are activated.

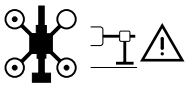


The machine is STABILISED, LEVELLED AND NO LONGER STOWED AWAY.



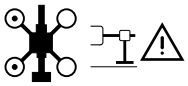
The machine IS TILTED OVER 1°.

The loss of levelling is not an optimal condition; however, the electronic system of the machine does not impose any blockage in the movements as it is however still safe. It is the discretion of the operator to continue using the machine or to close the aerial part and to return the machine to stability.



The machine HAS LOST THE APPLICATION OF A STABILISING FOOT

The electronic system of the machine does not impose any blockage in the movements as it is however still safe. It is the discretion of the operator to continue using the machine or to close the aerial part and to return the machine to stability.



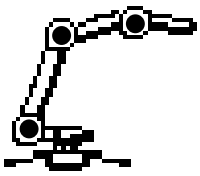
The machine HAS LOST THE APPLICATION OF TWO STABILISING FEET

Loss of the support of two stabilising feet is a dangerous condition.

Movements of the aerial part are blocked except for:

- lifting the main boom;
- closing the second boom;
- closing the third boom.

MACHINE WITH TRACTION ENABLING WITH MACHINE OPEN



The machine is ENABLED FOR TRACTION WITH THE MACHINE OPEN when all the constraints mentioned in the paragraph ‘enabling traction with the machine open’ are met.

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3. USING THE MACHINE

Before any operation read and understand this manual and the instructions on the plates and stickers.

Checks before use

Before commissioning and each use, the machine must be checked as indicated below; in addition, safety checks must be carried out when commissioning.

Make sure there NO:

- oil leaks from pipes or other hydraulic components;
- electrical conductors that are cut or disconnected;
- irregular cuts or wear in the rubber tracks;
- damage, deformations, loose or missing screws and bolts, cracked welds.

Check that:

- the ground to be worked on is hard and capable of supporting the maximum load transmitted by the crawling track and by the plate;
- the user manual is present;
- all the plates and stickers are present and legible;
- the work area is clear and free from unevenness or holes.

In addition:

- check the hydraulic oil level;
- make sure there is fuel in the tank;
- ensure the correct tensioning of the rubber tracks;
- first turn on the ground panel and then the push-button panel; wait approximately ten seconds for the end of the ignition sequence;
- make sure no errors are reported on the push-button panel display or on the ground box light indicators.

For periods of inactivity longer than 7 days, carry out at least 2 complete stabilizations (lower the stabilizers until the mechanical limit switch is reached) before using the platform.

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First use

- It is recommended to perform all the familiarisation operations with the distribution pipes EMPTY.
- The inside of new concrete pipes is rough and they must be “run in” with GROUT the first time they are used. This is done to avoid clogging inside the pipes.
- Flushing with grout must be carried out immediately before pumping.

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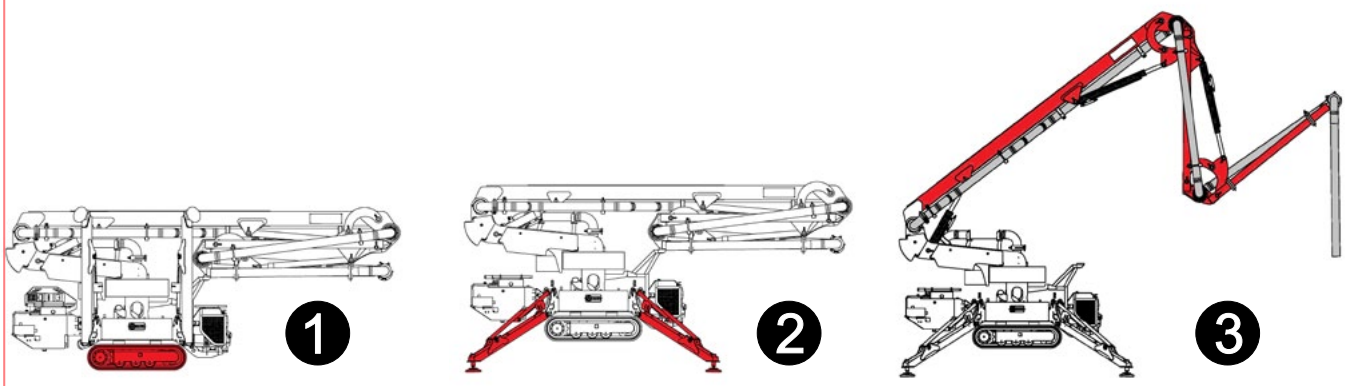
Mode of use

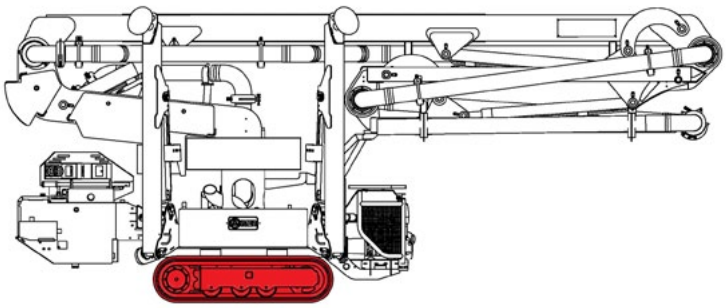
To operate the distribution of the concrete it is necessary:

1. move the machine to the work position by traction and steering;
2. stabilise it;
3. lift the main boom and move the aerial part until it reaches the position (if you intend to enable traction with the machine open, follow the instructions on page 44).

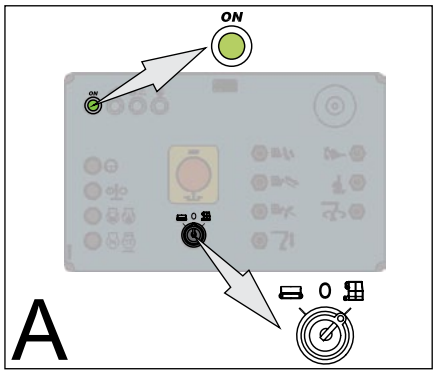


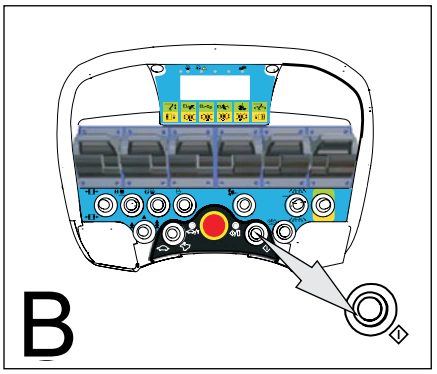
Make sure the red emergency stop button is not pressed on the ground panel and push-button panel.

Moving the machine to the work position



Turning on the machine





A. Insert the key into the selector on the ground panel and rotate it to the right, the ON light will come on.

Upon each power on, the acoustic and light signals (lights and buzzer) turn on to check their efficiency. Wait for them to turn off before using the machine.

B. Turn on the push-button panel with I1.

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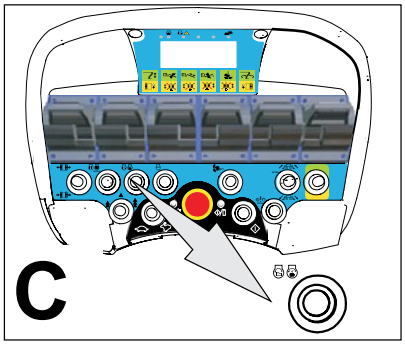
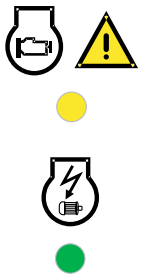
Starting the engine

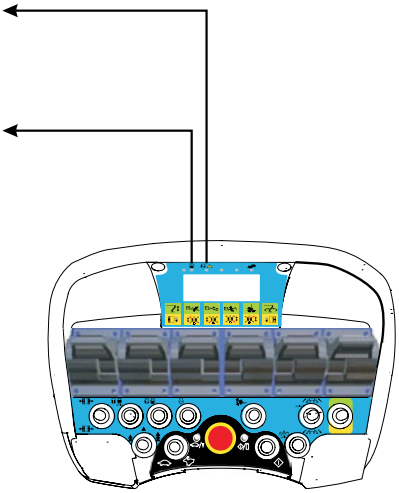
C. Start the combustion or electric engine with switch I2.





If the yellow light is on, the mains voltage is disconnected and the combustion engine starts.

If the green light is on, the mains voltage is connected and the electric motor starts.
The differential thermal magnet must be active.



Traction and steering

To perform traction the machine must be STOWED AWAY.

Performing traction from the ground with the push-button panel, maintain a distance of at least 2 meters from the machine.

Check that the work area is free from persons, animals and obstacles before making any movement.

Check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards.

Where the ground allows it, widen the tracks as far as possible to increase the stability of the machine.

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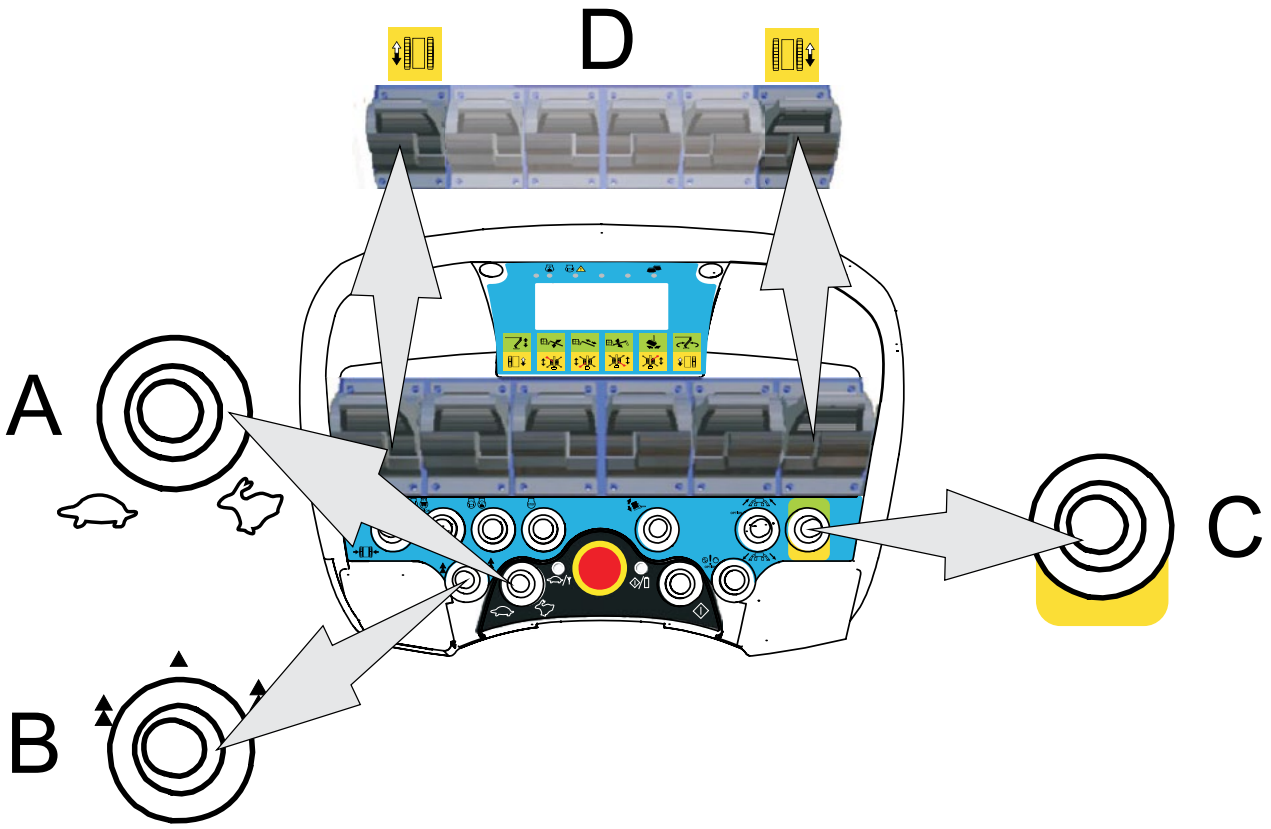


A With selector S3 **set the engine speed** (if using the combustion engine).

B With selector S2 **select the speed**.

C Bring S6 back to **activate ground movements**.

D Move the two crawling track manipulators M1 – M6 forward.

If necessary, **widen or close the tracks** with selector S1.

The track variation should be carried out possibly simultaneously with the traction.

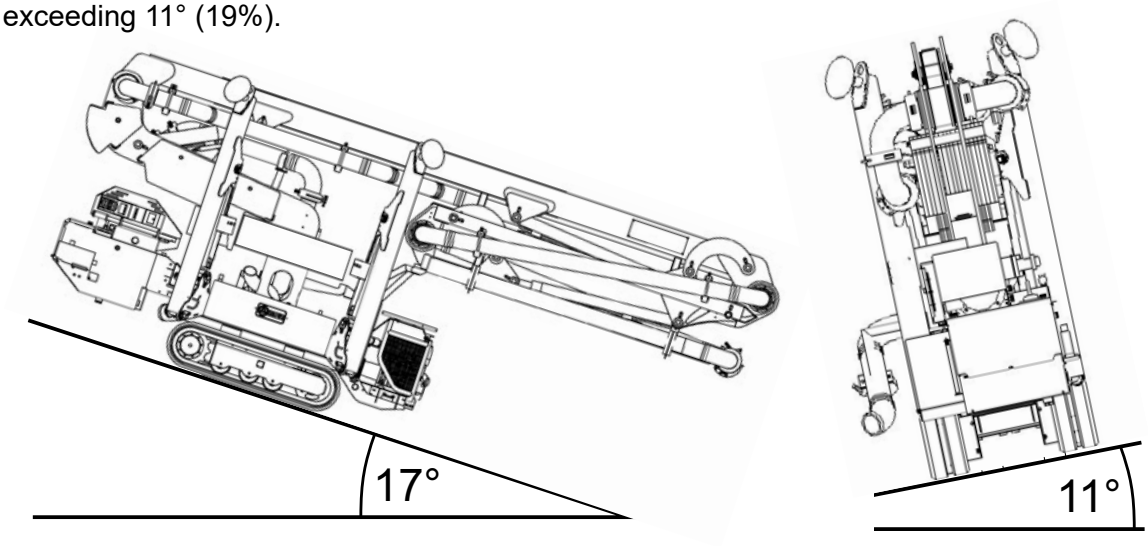
To steer, the crawling track speeds must be different so that **M1 and M6 have different inclinations**.

- **Steering right**: give more inclination to **M1.**
- **Steering left**: give more inclination to **M6.**

The 'HARE' speed is automatically entered if the proportionality of the manipulators exceeds 50%.

Driving on sloping terrain

- Do not drive the machine up or down on land with a slope greater than 17° (30%).
- When driving on side slopes, maximise the crawling track width to increase stability and lower the downstream stabilisers until they are close to the ground. Do not drive the machine on side slopes exceeding 11° (19%).



During traction the inclination of the carriage is continuously kept under control and a pre-alarm and an alarm are activated if safety limit thresholds are reached.

Pre-alarm

If the inclination of the carriage exceeds 10° longitudinal and/or 6° transverse, a pre-alarm is triggered consisting of:

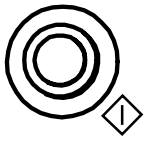
- an intermittent high-frequency acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with the same frequency as the audible alarm;
- the traction speed of the machine is automatically reduced.

Alarm

If the inclination of the carriage exceeds 17° longitudinal and/or 11° transverse, an alarm is triggered consisting of:

- a low frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with the same frequency as the audible alarm;
- machine traction is automatically blocked.

Override



In the event of a traction lock alarm, the operator can bypass the alarm for a limited time in such a way as to remove the machine from the excessive tilt situation.
To activate this function press the power button of the machine for 5 seconds. The change of acoustic and visual signals communicates the transition from the alarm situation to the pre-alarm situation described above.
At this point there are 30 seconds to manoeuvre at reduced speed and to exit the overtilt configuration.

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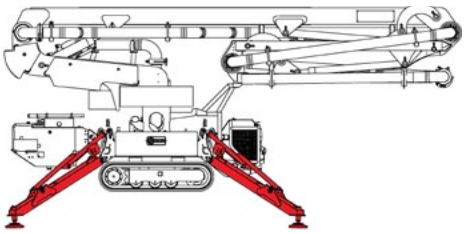
Stabilising the machine

Once the machine is positioned, the next steps are stabilisation and levelling.



Movement of the stabilisers is only possible with the machine stowed away.

Automatic levelling is only an electronic aid that greatly increases the ease of use of the machine. The following recommendations should not be overlooked for ease of use.

Before proceeding with the stabilisation operations, make sure that there are no persons in the range of the plates of the stabiliser cylinders.

Before starting the stabilisation operation, make sure that the ground under the stabilisers is horizontal (without unevenness or holes), with good adhesion and is able to withstand the maximum load transmitted to the ground by the stabilisers, reported by the plates applied on the machine.

If necessary, place robust weight distribution plates under the stabiliser plates.

Check that the stabilisers do not come to rest on manholes or pipes.

Stabilisation will be completed when the machine is placed in a horizontal position with a tolerance of less than 1°.

Stabilising the machine with a degree of inclination greater than that permitted can make it unstable and cause serious damage to property and persons
It is absolutely essential to work with the machine stabilised with inclination lower than the limit permitted by the manufacturer.

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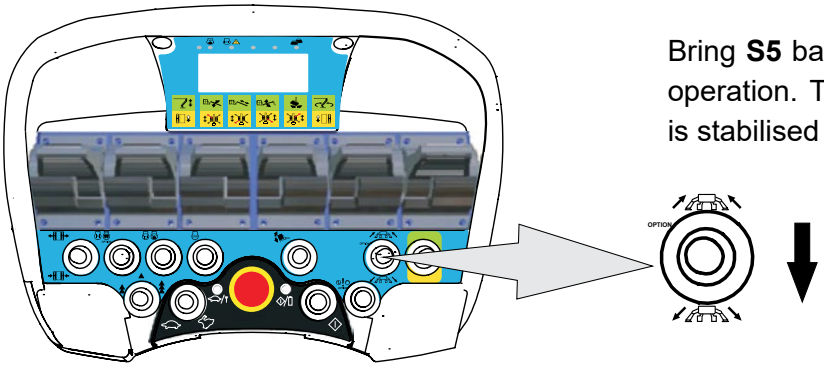
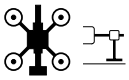
Automatic stabilisation



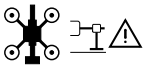
Bring **S5** back and keep it pressed throughout the operation. The stabilisers are lowered, the machine is stabilised and levelled.

When the icon appears on the push-button panel  display, the levelling has been reached and the movement automatically stops.

- Turn the selector back to neutral.
- To lift the carriage further off the ground, perform another automatic stabilisation.
- Always visually check the actual levelling of the machine using the appropriate spirit level.

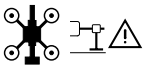
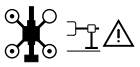
At the end of the automatic stabilisation, the manual foot movement manipulators are disabled.

With the distribution boom housed in its seat

- If the machine tilts more than 1°, the icon on the display becomes  indicating the loss of levelling.
- If the support of one or more stabilising feet is lost, the movements of the aerial part are blocked.

In both cases repeat the stabilisation phase.

With the aerial part open

- If the machine tilts over 1°, the icon on the display becomes  indicating the danger of tipping over.
- If the support of a stabilising foot is lost, the icon on the display becomes  : movements of the retraction aerial part that are not destabilising are permitted.
- If the support of two stabilising feet has been lost, the icon on the display becomes : the movements of the aerial part are blocked except for the movements that facilitate the return of at least 3 stabilising feet to support conditions:

  - lifting the main boom;
  - closing the second boom;
  - closing the third boom.

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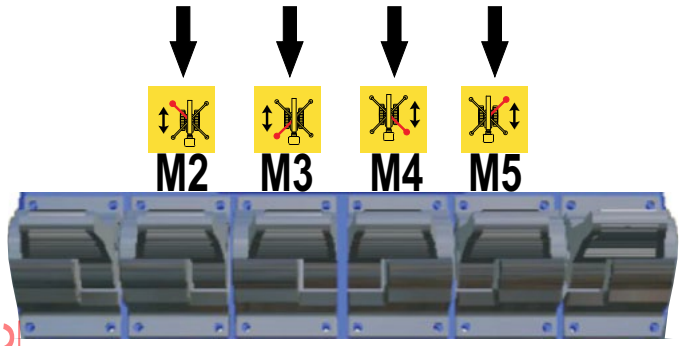
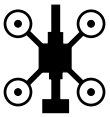
Manual stabilisation



Bring back the 4 manipulators **M2 – M3 – M4 – M5** to stabilise the machine.

The icon must appear on the push-button panel display:



A foot resting on the ground can no longer be lowered until all four feet are resting.

After stabilisation:

- check that the **tracks are raised off the ground**;
- visually inspect the actual **support of the cylinders**;
- visually check the**actual levelling of the machine** using the appropriate spirit level.

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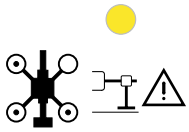
Carriage tilt control

Once stabilisation has been completed, the aerial part can be lifted and work can begin.

During work, inclination of the carriage is continuously kept under control and a pre-alarm and alarm are activated if the safety limit thresholds are reached.

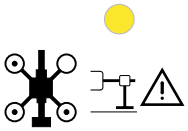
Pre-alarm



If the inclination of the carriage exceeds 1.2°, a pre-alarm is activated consisting of:

- a high-frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with a sequence of three flashes: short - long - short;
- a stabilisation alarm icon appears;
- all movements are permitted but their speed is automatically reduced.

Alarm



If the inclination of the carriage exceeds 1.5°, an alarm is triggered consisting of:

- a low frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with a sequence of a long flash and a pause;
- A stabilisation alarm icon appears;
- the movements of the aerial part are blocked except for the movements that facilitate the return to pre-alarm conditions:
  - lifting the main boom;
  - lowering the second boom;
  - lowering the third boom.

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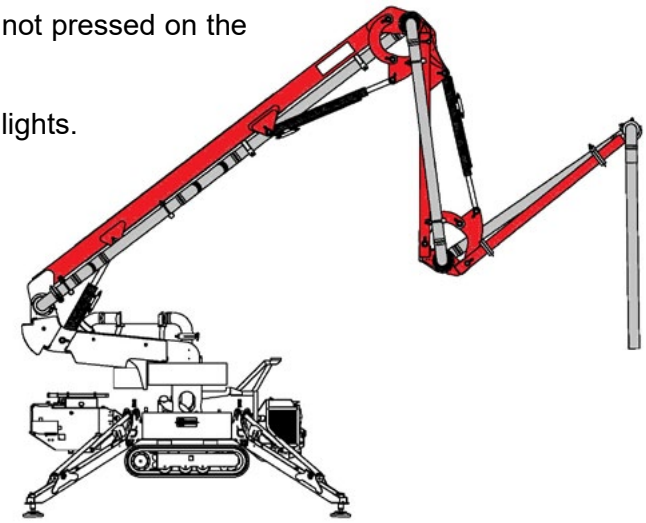
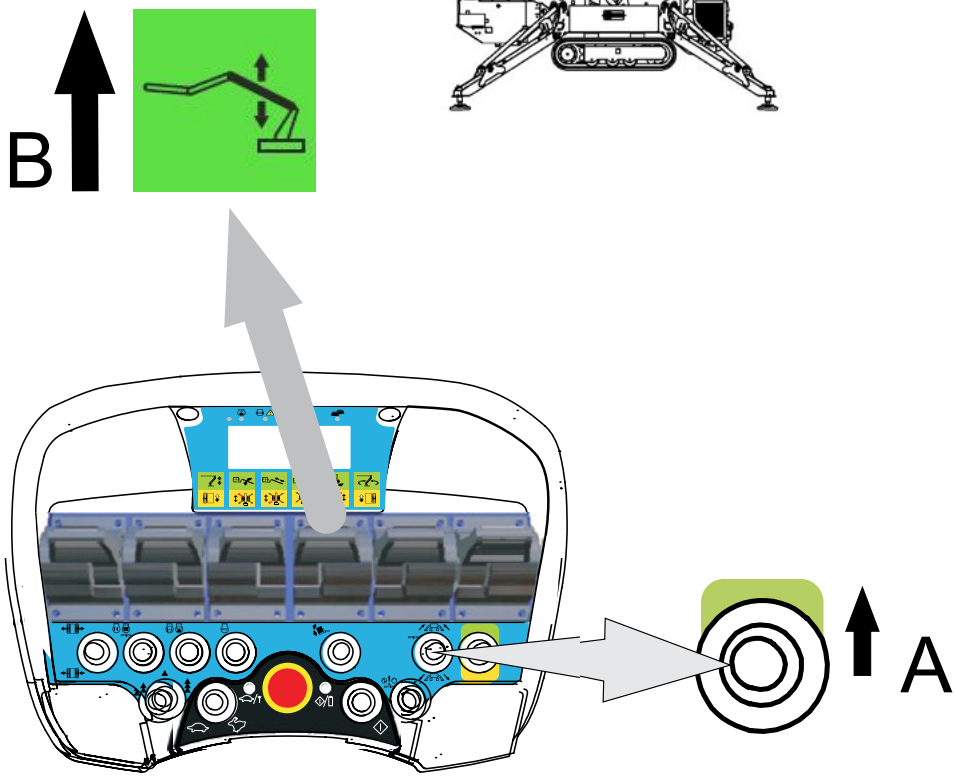
Moving the aerial part

- Make sure the red emergency stop button is not pressed on the ground panel and push-button panel.
- Always check the situation of the emergency lights.





A Move forward **S5.**

B Lift the main boom by moving the joystick **M4** forward.

Lifting the main boom activates the turret movements controlled by joystick **M5.**

Lifting the main boom beyond 10° activates the movements of the aerial part controlled by joysticks **M2** and **M3**.

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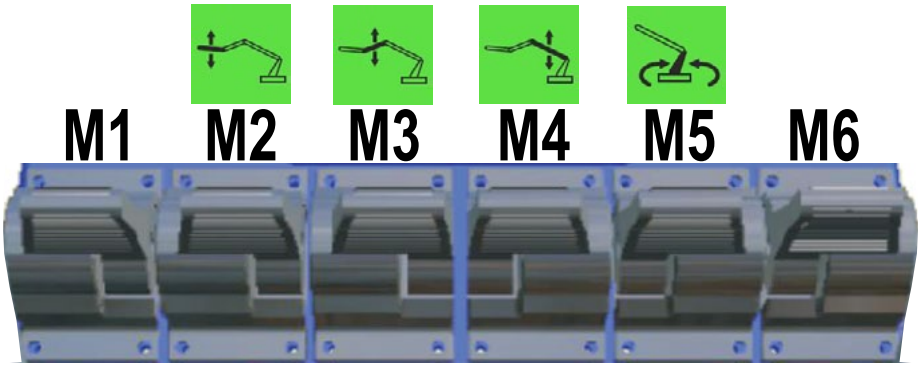

JOYSTICK		AERIAL MOVEMENT
M2 THIRD BOOM	Forward	Closing
	Back	Opening
M3 SECOND BOOM	Forward	Closing
	Back	Opening
M4 MAIN BOOM	Forward	Ascent
	Back	Descent
M5 TURRET	Forward	Clockwise
	Back	Counterclockwise

The turret movements are enabled when the distribution boom is detached from the support on the carriage (disabling the magnetic stowed away micro).

The movements of the second and third booms are enabled only with the main boom lifted by 10° with respect to the fifth wheel plane.

Make sure that the rubber end hose is free of any obstructions and that it does not get caught when the boom is opened and closed.

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Simultaneous aerial movements

When performing aerial movements at the same time the machine is automatically accelerated.

The movements of maximum two arms and of the turret can be operated in the various combinations of up/down and exit/return at the same time.

Single aerial movements are performed automatically by the machine at minimum engine speed without loss of performance.

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Enable traction with open machine

- For enabling and traction functions with the machine open, refer to the relative paragraph on page 44.

Aerial moves are not allowed if traction with open machine is enabled.

Using the distributor boom - recommendations

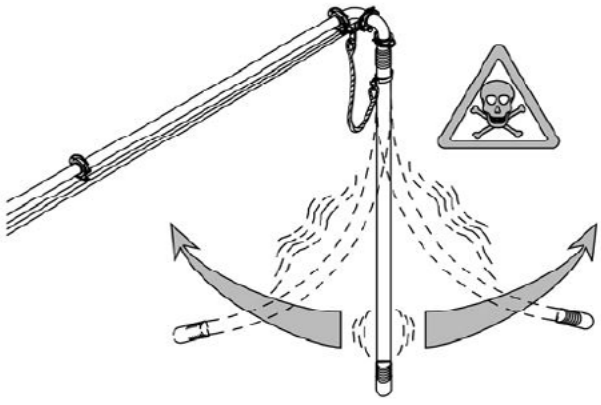
Before performing any operation, the operator must make sure that there are no dangers to him/herself or others.

It is forbidden to manoeuvre or hold the rubber end hose.

Do not stand within the operating range of the rubber end hose.

The sudden release of any blockages may result in violent whiplash.

Pay attention to the vertical swinging of the boom, caused by pumping concrete into the pipes.



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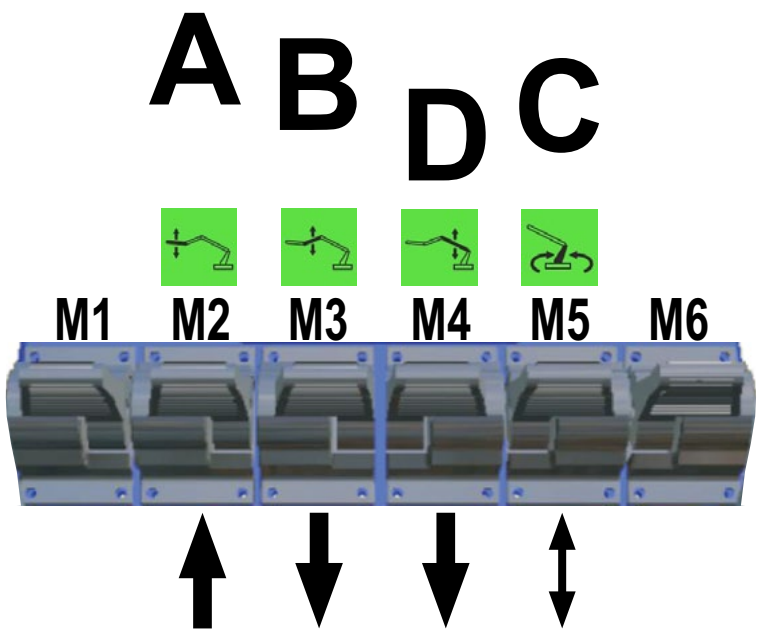
Return to machine stowed away

Once the work at height has been completed, return the machine to being stowed away.

If traction is enabled with the machine open, go back to the MACHINE OPEN status by lowering the stabilizers.

Retraction of aerial part



A Fully retract the third boom by pushing **M2 forward**.

B Fully retract the second boom by pulling **M3 back**.

C Rotate the turret with **M5** until it is perfectly in axis with the carriage.

D Close the main boom completely by pulling **M4** back.

The movements of the second and third booms are enabled only with the main boom lifted by 10° with respect to the fifth wheel plane.

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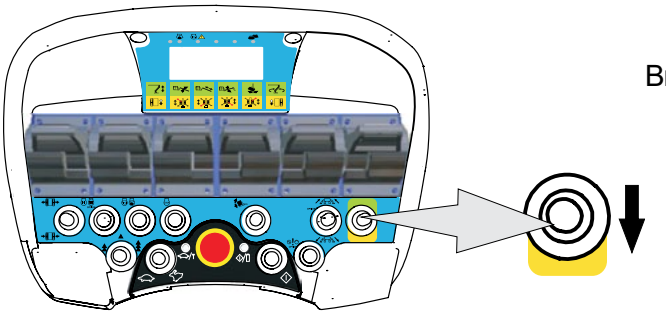
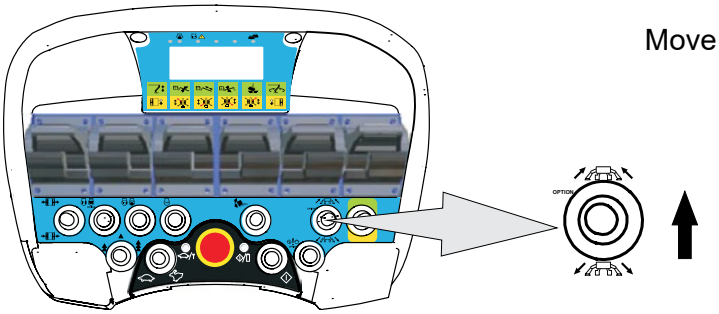
Retraction of stabilisers

Retraction of the stabilisers is only enabled with the distribution boom housed in its seat.



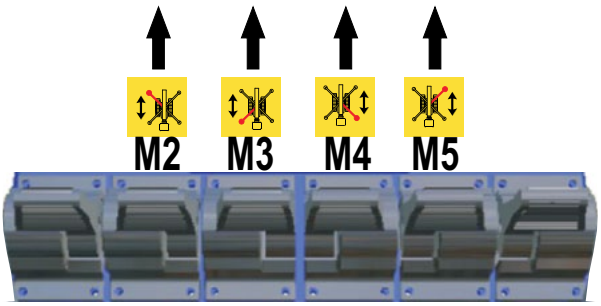
Bring **S6** back to **activate ground movements**.

Automatic procedure



Move **S5** forward until the movement is stopped.

Manual procedure



Move the 4 manipulators M2 – M3 – M4 – M5 forward to raise the feet.

At this stage there is no control over the movement sequence of the stabilisers. Pay close attention seeking to lower the machine while always keeping it as level as possible.

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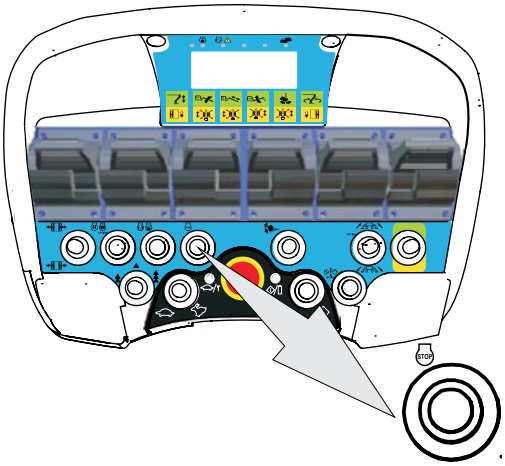
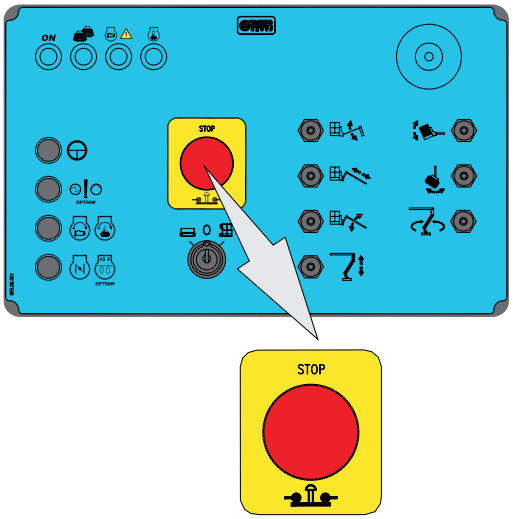
Turning off the engine



From the push-button panel

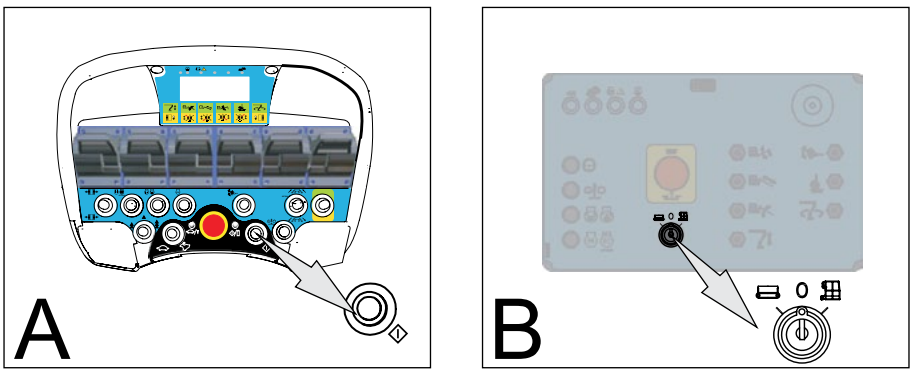
- Switch off the endothermic engine with switch I4.



From the ground control box

- Press the emergency button 2.

Turning off the machine



A . Switch off the push-button panel with switch I1.

B . Return the key to the central position in the ground control box.

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End of pumping and cleaning operations

Cleaning operations must not cause any damage to the environment.

The residual concrete and all materials resulting from the washing of the entire equipment must be managed in compliance with the regulations in force.

After each pumping cycle it is essential to carry out a thorough cleaning of the pipeline, in order to prevent concrete encrustations which could give rise to frequent clogging within the pipeline itself.

End of works

- Always remove the key from the selector.

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Emergency procedures

Emergency manual movements

If the machine stops due to a mechanical or electrical failure, it is possible to intervene returning it to the transport configuration by means of an operator on the ground.

In the **standard configuration** of the machine, the emergency procedure involves the use of the solenoid valves of the hydraulic blocks on the machine and the movements are carried out by means of a manual pump positioned on the side of the tank.

If the **optional 12 V electric pump** is installed on the machine, the movements are performed electrically.

There are two emergency procedures with the use of the 12 V electric pump depending on the type of problem:

- machine locked without alarm signals;
- machine locked in alarm.

The procedure to be followed when the machine is locked in alarm is the same as that used for the standard configuration with manual pump.

The 12 V electric pump is connected to starter battery. Prolonged use results in rapid discharge.

Before carrying out emergency movements, it is essential to ensure that there are no obstacles.

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Emergency manual descent procedure

When it is necessary to use the manual pump to put the machine in a safe condition and close it, this procedure should be followed in order to avoid destabilising movements, prevent a more dangerous situation from arising and avoid interference between the distribution boom and the carriage.

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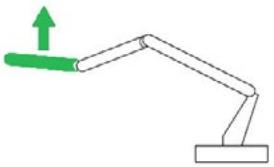
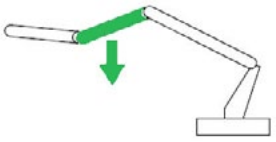
If traction is enabled with the machine open, first lower the stabilizers until all four are well rested on the ground.

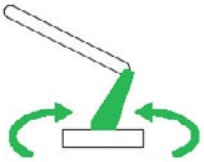
Phase 1: CLOSING the third boom.



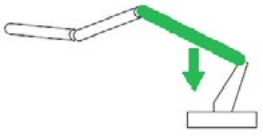
Phase 2: CLOSING the second boom.



Phase 3: ALIGNING the turret with the carriage.



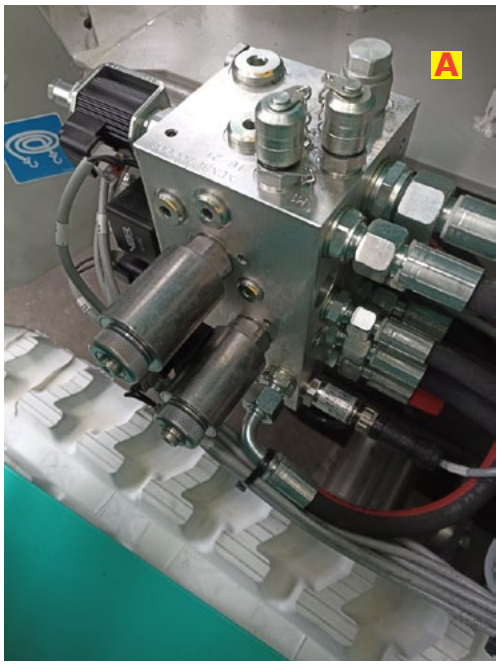
Phase 4: LOWERING the main boom.

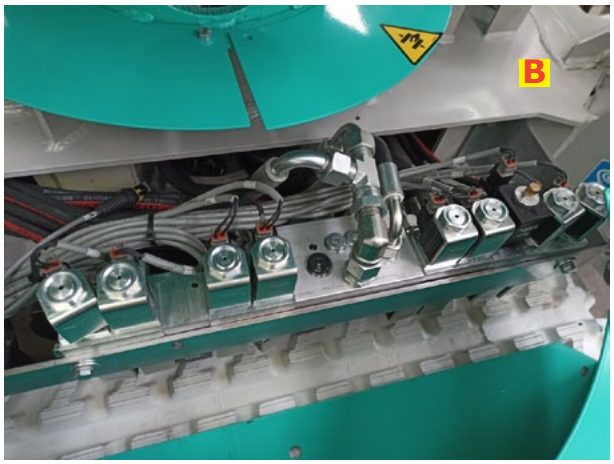


With manual pump

The main block is located in the right box (A); the handling blocks are located in the left box (B) and on the front side of the turret (C).

The manual pump is located on the left side of the tank.





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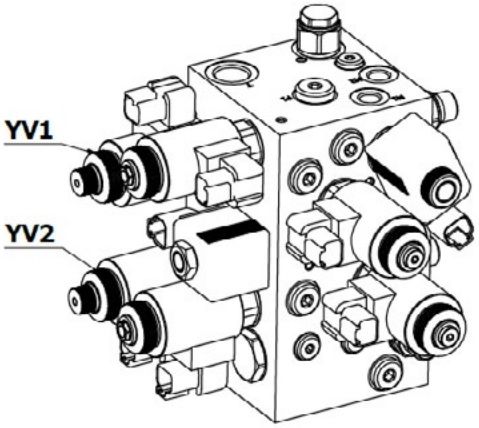
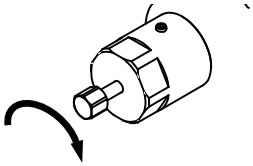
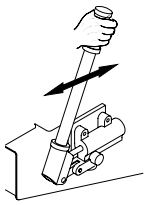
To perform a movement manually:

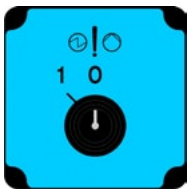
1. locate solenoid valve YV1 and YV2 on main block A;
2. screw the solenoid valve pawl without forcing it to the end of the stroke;
3. identify the required movement valve;
4. unscrew the coil ring nut and screw the pawl to open the valve box;
5. screw without forcing the pawl;





6. to perform the movement, operate the manual pump with the appropriate lever or, if present, operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete.





The 12 V electric pump start switch is located in the right box.

At the end of the operation, be sure to have returned the emergency solenoid valves to the initial setting as indicated below.

In MAIN BLOCK A:

1. fully unscrew the screw of valves YV1 and YV2.

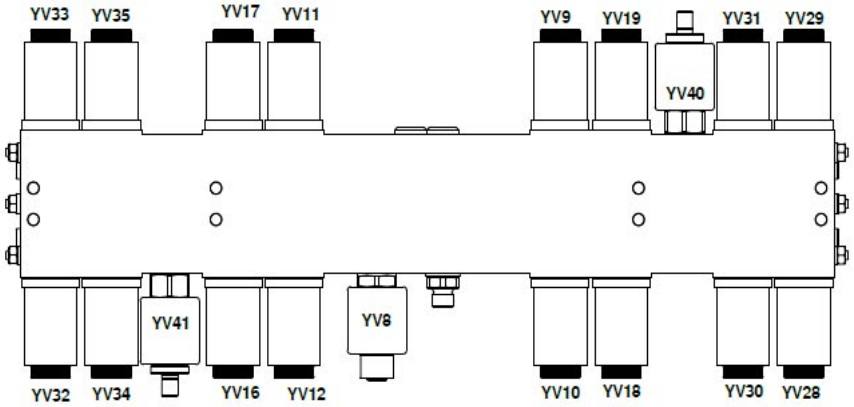
In BLOCKS B-C:

2. unscrew without forcing the solenoid valve pawl until the limit switch is reached.

Hydraulic blocks

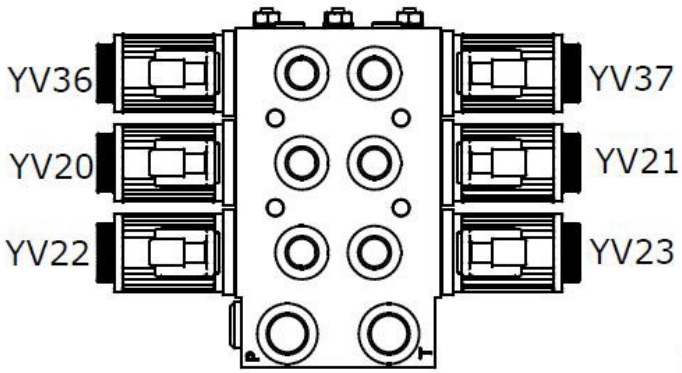
B

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



C

YV21	
YV20	
YV23	
YV22	
YV37	
YV36	



C

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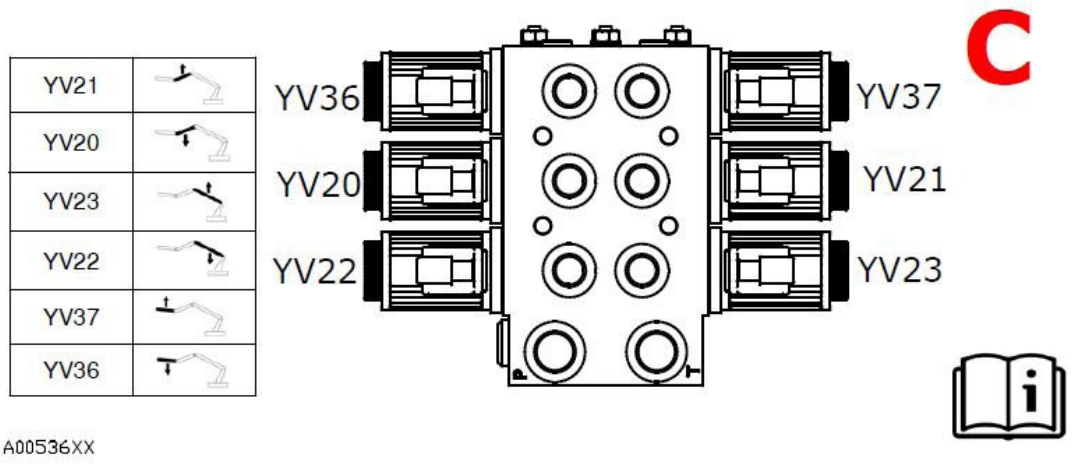
Example 1

It is necessary to **lower the main boom**:

1. motion is associated with solenoid valve YV22 of Block C;
2. screw the valves YV1 and YV2 of Block A;
3. unscrew the solenoid valve protection nut YV22 of Block C;
4. screw the emergency pawl without forcing it to the end of the stroke;
5. operate the manual pump with the appropriate lever until the boom is completely lowered or operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete;
6. unscrew without forcing the emergency pawl from solenoid valve YV22;
7. screw the solenoid valve protective nut YV22;
8. unscrew valves YV1 and YV2 of Block A.



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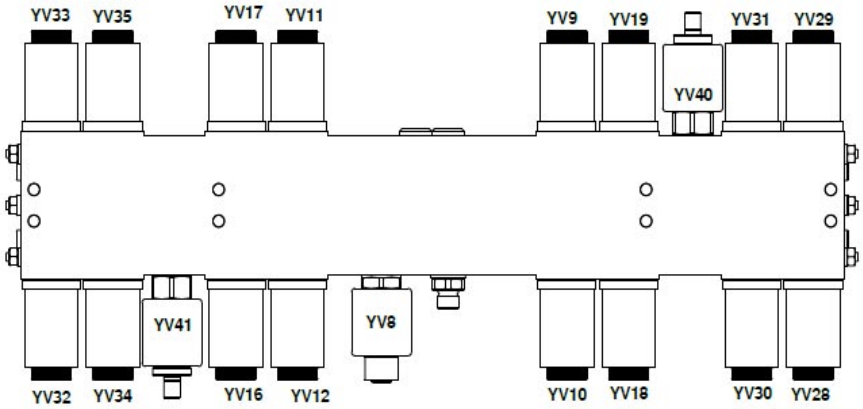
Example 2

It is necessary to **lower the left rear stabiliser**:

1. motion is associated with solenoid valve YV29 and YV40 of main Block B;
2. screw the valves YV1 and YV2 of Block A;
3. screw the solenoid valve YV40 of Block B;
4. unscrew the solenoid valve protection nut YV29;
5. screw the emergency pawl to the end of the stroke without forcing;
6. operate the manual pump with the appropriate lever until the stabiliser is completely lowered or, if present, operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete;
7. unscrew the solenoid valve pawl YV29 without forcing it;
8. screw the solenoid valve protective nut YV29;
9. unscrew the solenoid valve YV40;
10. unscrew solenoid valves YV1 and YV2.

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



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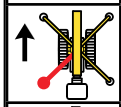
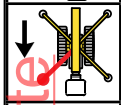
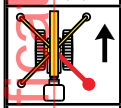
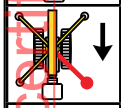
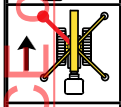
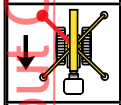
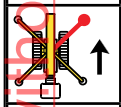
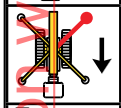
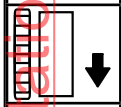
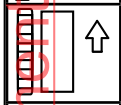
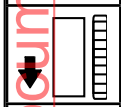
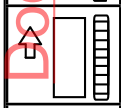
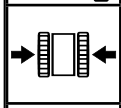
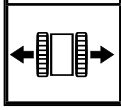
On this page and on the next there are 2 tables that summarise solenoid valves and movements. Always close solenoid valves YV1 and YV2 before carrying out the emergency movement and loosen them at the end.

	B-YV40	B-YV28	B-YV29	B-YV30	B-YV31	B-YV41	B-YV32	B-YV33	B-YV34	B-YV35	B-YV9	B-YV10	B-YV11	B-YV12	B-YV16	B-YV17
	X	X														
	X		X													
	X			X												
	X				X											
						X	X									
						X		X								
						X			X							
						X				X						
											X					
												X				
													X			
														X		
															X	
																X

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	B-YV18	B-YV19	C-YV20	C-YV21	C-YV22	C-YV23	C-YV36	C-YV37
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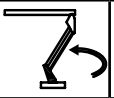
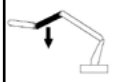
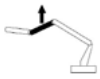
		X						
			X					
				X				
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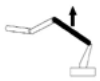
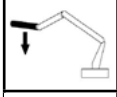
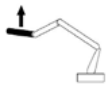
						X		
							X	
								X

Procedure with machine locked without alarm signals - With 12 V electric pump (optional)

The 12 V electric pump is connected to the starter battery: prolonged use results in rapid discharge.

Make sure that the machine is not connected to the 230 V mains or that the differential thermal magnet is deactivated.

In models with radio control the push-button panel must be switched on.

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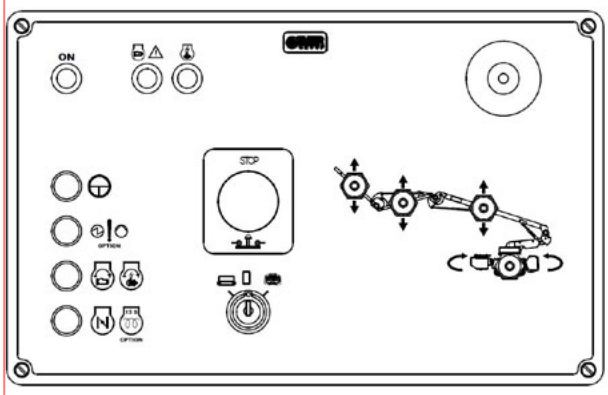
From the ground

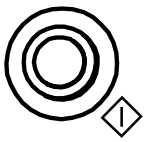
Perform the following operations from the ground control panel:



1. turn the key on the selector to the left;
2. press the button to turn on the 12 V electric pump;
3. press and hold the man button present and simultaneously move the selector of the movement to be performed.

From the push-button panel

1. From the ground control panel turn the key on the selector to the right;
2. turn on the push-button panel with I1;

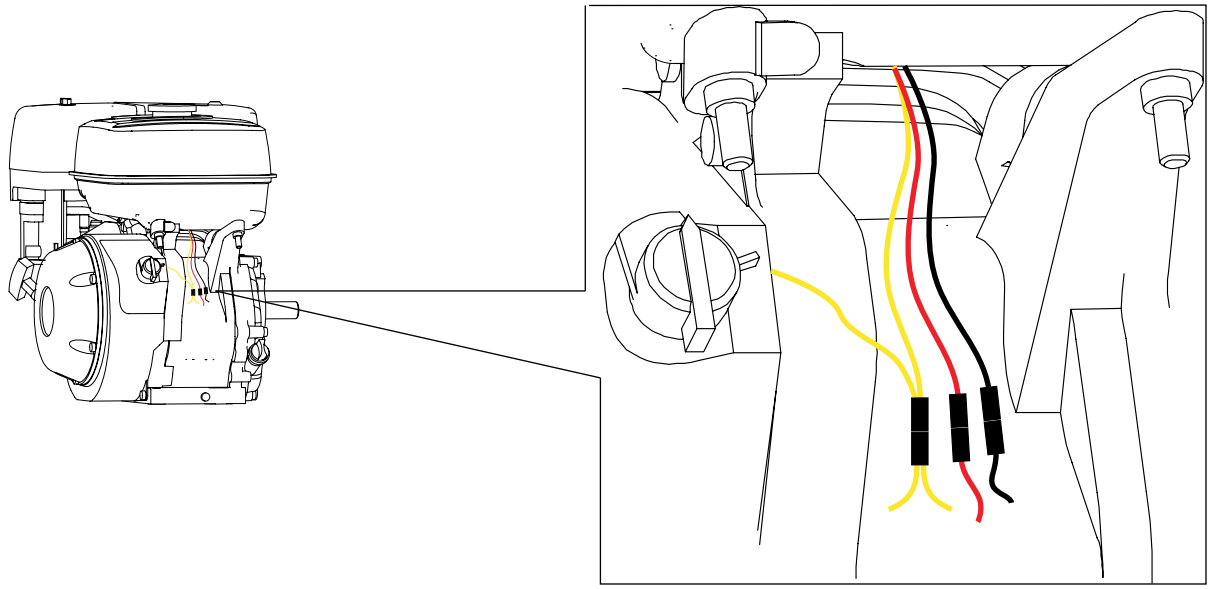


3. press switch I6 to turn on the 12 V electric pump;
4. move the joystick of the movement to be performed.

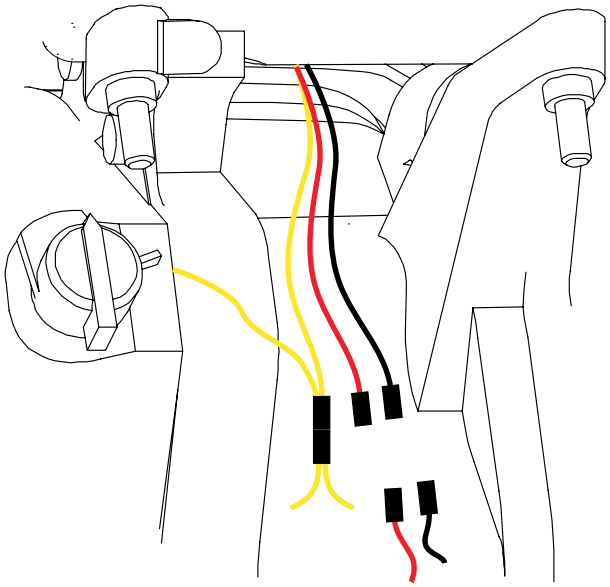
Manual starting of the combustion engine

Petrol engine

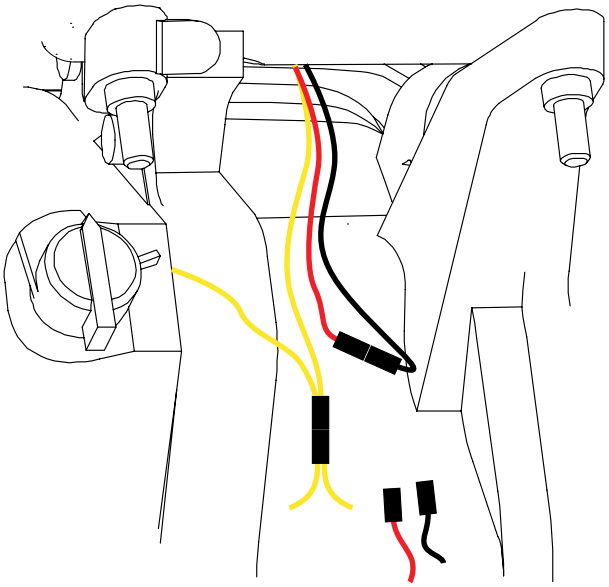
1. On the right side of the engine identify the 4 wires indicated in the figure (2 yellow - 1 red - 1 black).



2. Disconnect the red and black wires from the respective connectors.



3. Connect the two terminals.



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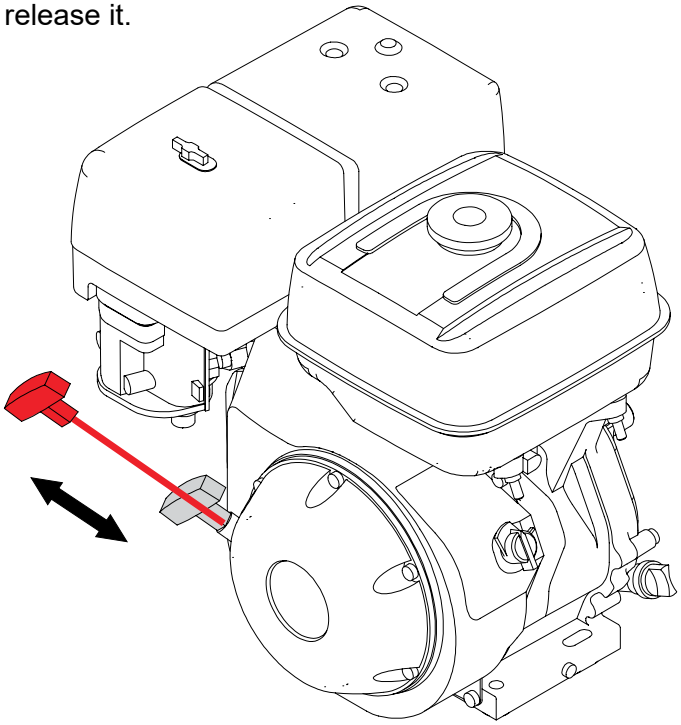
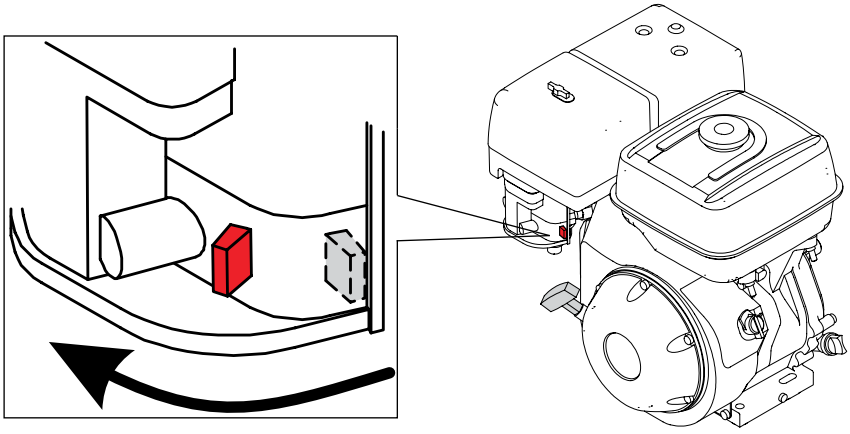
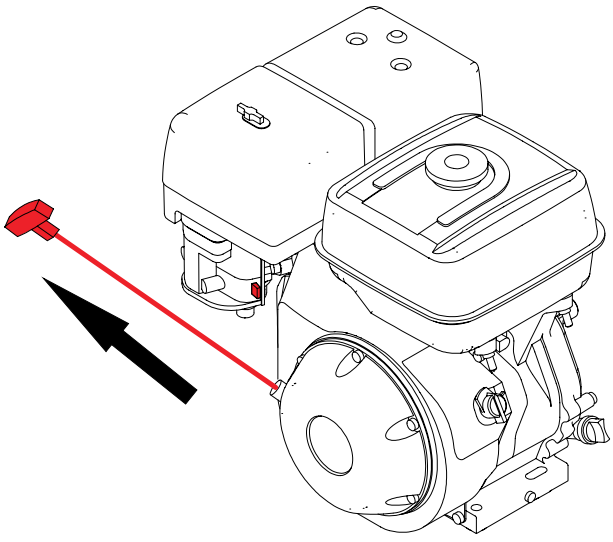
4. Pull the engine ignition lever until it resists and release it.



5. Pull the air lever outwards.



6. Pull the lever firmly.



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Battery charging

The icon on the push-button panel display, in addition to signalling the alternator fault (on steady), indicates the status of the ignition battery.

- Flashing on: the ignition battery is below the safety level and must be recharged.

To recharge, it is necessary to connect the machine to the 220 V mains and to activate the magnetothermic of the electric pump-charger.

The charger will turn on a green light while charging the batteries and a red light when it reaches full charge.

220 V line rectifier characteristics

- 12 V 12 A charger
- Power supply 185/265 V – 47/62 Hz
- Operating temperature from -10° C to +40° C
- IUoU charge curve
- Output short circuit protection
- Reverse polarity protection
- Weight 1.3 kg

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Transport

Make sure that the means used for transportation and/or lifting supports the weight of the machine.

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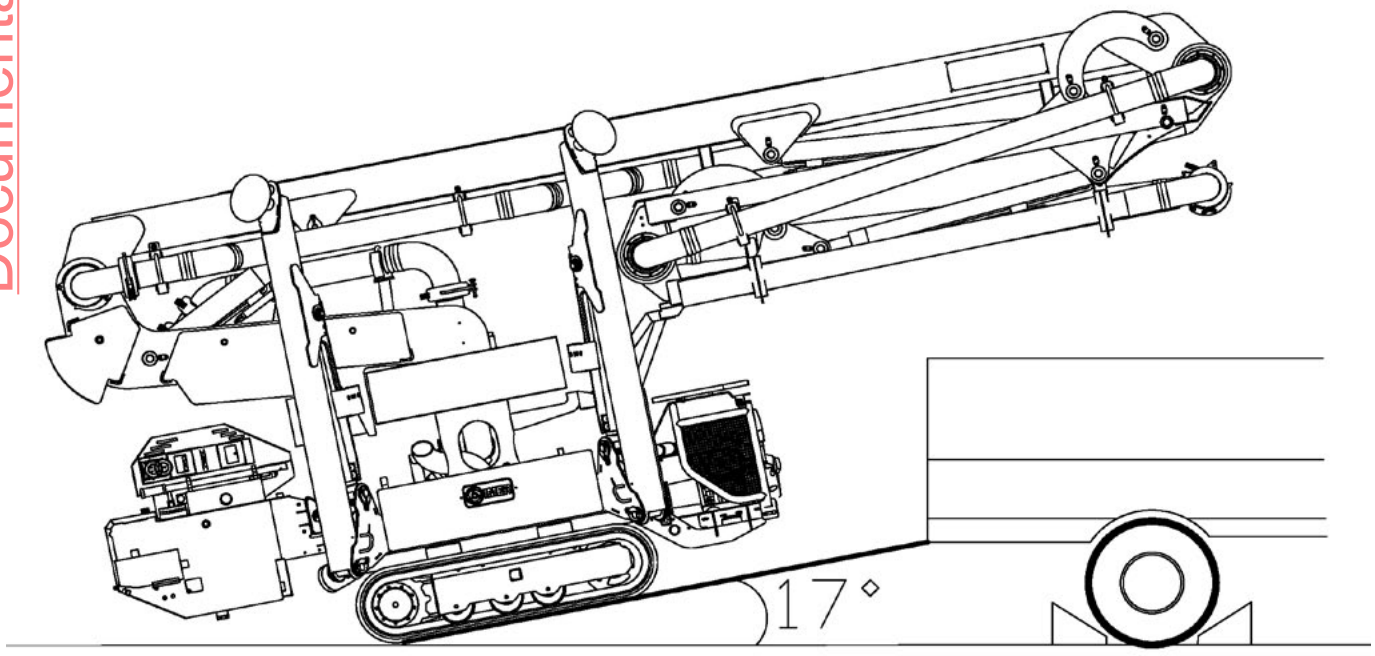
Machine loading and unloading

Loading and unloading of the machine on the platform of the means of transport can take place:

- using ramps;
- by lifting.

Using ramps

- Park the means of transport on a flat surface.
- Position the ramps parallel to each other, at a distance equal to that of the tracks and with an inclination not exceeding 17°.
- Always carry out loading and unloading operations by driving the machine from the ground while maintaining the safe distance.
- Proceed with caution, at the minimum speed to avoid bouncing of the machine.
- Place the machine such that no part of it exits the platform area.



By lifting

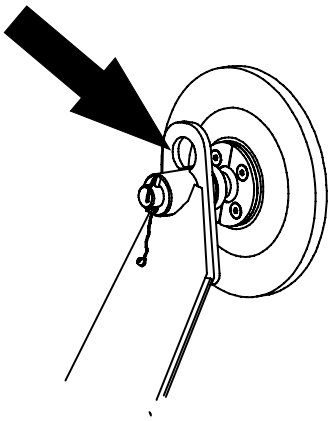
Lifting must be carried out with cranes, overhead travelling cranes or forklift truck.

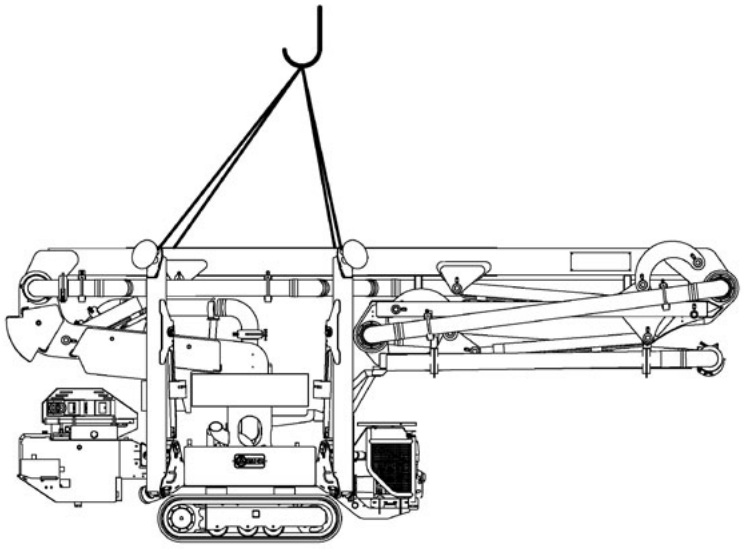
Use of cranes or overhead traveling cranes

Use straps, chains and hooks in a perfect condition.

- Lift the machine only when it is stowed away.
- The area involved in the lifting must be clear.
- Do not transit with the machine suspended over persons.

Hook the machine with ropes or chains passing through the 4 attachment points indicated by dedicated stickers.





Do not harness the machine in any way other than as shown as this could cause structural damage.

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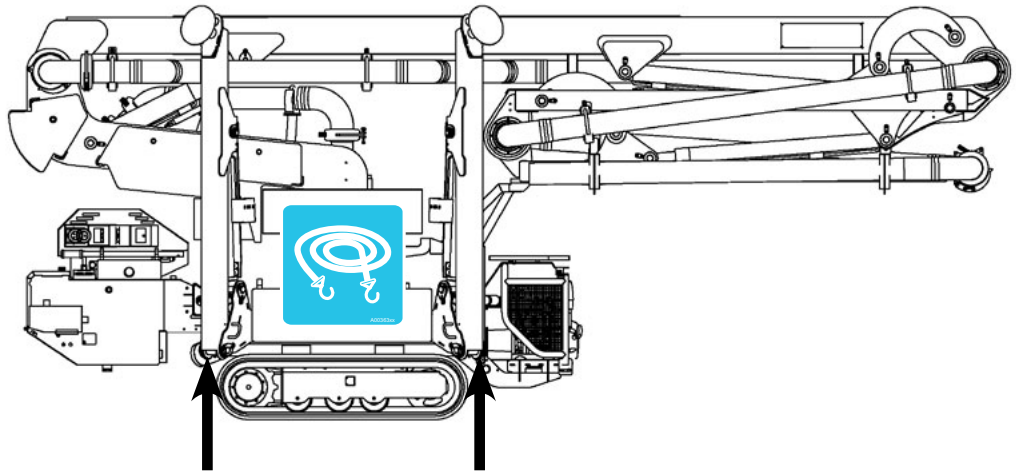
Securing the machine

For transportation, secure the machine to the floor of the vehicle with straps passing through the 4 attachment points, 2 front and 2 rear, indicated by dedicated stickers.



Do not secure the machine to points other than those indicated by the stickers.

It is forbidden to operate the machine when it is positioned on the platform of the means of transport.

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Storage

In case of long storage periods, store the machine, with the batteries fully charged in a dry and ventilated environment. If possible, leave the charger connected and powered to allow the batteries to be maintained, otherwise charge the batteries regularly every 2 months.

Storage temperature: -20/+50°C.

Before using the machine after a storage period of more than 90 days, carry out the checks shown in the summary maintenance table, under the item "after long periods of inactivity".

Disposal and scrapping

The machine mainly consists of steel, aluminium, plastic, synthetic rubber and copper.

Particular attention should be paid to the disposal of electrical batteries (Italian Legislative Decree 188/08) and of the hydraulic oil contained in the tank and inside the hydraulic circuit (Italian Presidential Decree 691/82).

The main components of the machine are listed below.

- Cast Iron
- Nylon
- Steel
- Teflon
- Copper
- Polycarbonate
- PVC
- Ertalyte

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4. MAINTENANCE

The long service life of the machine and maximum operating safety are guaranteed by careful and assiduous maintenance.

The times indicated in the maintenance summary table refer to normal conditions of use; in case of difficult working conditions (extreme temperatures, polluting atmosphere, high humidity, high altitude, etc.) they must be reduced.

The frequency and extent of periodic maintenance and checks may depend on the national regulations.

Perform normal maintenance operations with the distribution boom fully lowered and with the machine stowed away and switched off.

The handling or lifting of heavy parts must be performed using lifting equipment of adequate capacity.

Wear appropriate personal protection equipment during maintenance.

During maintenance, fence off the work area or display signs to prevent access to unauthorised persons.

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Cleaning the machine

At the end of each work shift or when it is deemed necessary, clean the machine:

- clean all surfaces with a compressed air blower, trying not to create accumulations of dirt;
- spray a normal degreasing product and remove any remaining dirt with cotton rags.

Never use thinner products, scrapers and steel brushes to avoid damaging painted surfaces.

Do not clean the machine using pressurised water jets; the penetration of water or moisture inside the electrical components could cause malfunctions and/or damage to the electrical/electronic control parts.

Cleaning the distribution boom

After each work shift or when deemed necessary, clean all parts of the boom that have been in contact with the pumped material or with additives and chemicals in general:

- do not direct jets of water at kingpins, cylinder rods and any parts of the electrical system;
- always make sure that the kingpins are free of concrete; even the cylinder rods must be perfectly clean.

Inspections summary table

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Inspections Summary Table				
Type	**Frequency**	**First responsibility**	**Service Qualification**	**Documentary references**
Pre-Start Inspection	Before each use and at each operator change	User or Operator	User or Operator	Use and Maintenance Manual
Pre-Shipping Inspection	Before each shipment or rental	Manufacturer or Renter	IMER Qualified Mechanic	Use and Maintenance Manual
Semi-Annual Check	Every 6 months	Renter	IMER Qualified Mechanic - Service Centre	Use and Maintenance Manual
Annual Check	Every 12 months; not more than 13 months from the date of the previous check	Renter	Service Centre	Use and Maintenance Manual
Preventive maintenance	Yearly	Renter	Service Centre	Use and Maintenance Manual

Maintenance summary table

An annual check by an authorised assistance centre is recommended.

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OPERATIONS TO BE PERFORMED	AFTER THE FIRST 50 HOURS	EVERY DAY	WEEKLY	MONTHLY	100 HOURS OR 6 MONTHS	250 HOURS OR ANNUAL	AFTER LONG PERIODS OF INACTIVITY (90 days)
Checking of the plates and stickers		o					o
Check oil level				o			o
Replacing the oil filter cartridge	o					o	o
Greasing of the moving parts					o		o
Screw tightening check	o				o		o
Check the battery charge		o					o
Checking of safety devices		o					o
Emergency manual movements control					o		o
Checking the brakes					o		o
Checking of structures	o			o			o
Hydraulic pipe status check						o	o
Checking the power and auxiliary cables						o	o
Checking of performance						o	o
Rubber tracks maintenance	o				o		o
Check couplings		o					o
Rotate the pipes			o				o
Check pipes for wear				o			o

The following pages describe the operations shown in the table.

Combustion engine maintenance

Below is the maintenance table of the petrol engine. Refer to the engine operation and maintenance manual annexed to the machine for explanations.

Petrol engine **OPERATIONS TO BE PERFORMED**	WITH EVERY USE	20 HOURS OR MONTHLY	50 HOURS OR 3 MONTHS	100 HOURS OR 6 MONTHS	300 HOURS OR ANNUAL
Engine oil level check	X				
Change engine oil				X	
Air filter check			X		
Clean air filter			X		
Replace air filter					X
Clean filter sump				X	
Check - adjust spark plug				X	
Replace spark plug					X

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Electric motor maintenance

Periodically check that:

- the engine operates without vibrations or abnormal noise;
- the air inlet from the fan cover is not obstructed;
- there are no traces of dust, oil or other impurities on the engine.

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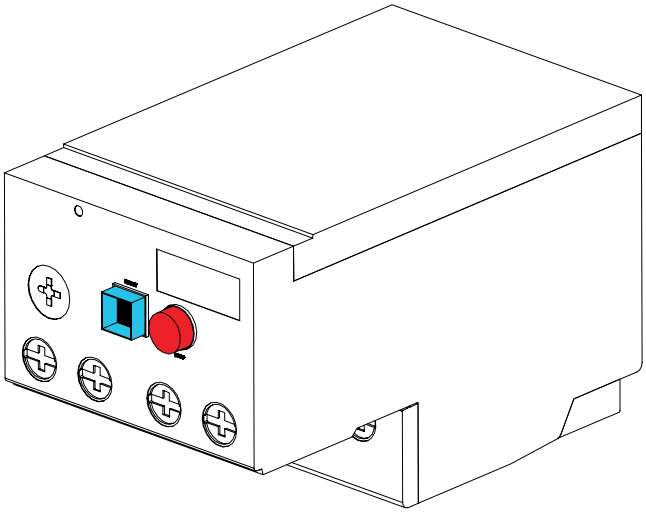
Thermal relay

To protect the electric motor from any current overloads, a thermal relay has been placed on the machine.

Perform the test for correct operation of the relay.

1. Open the thermal relay protection box.
2. Start the electric motor.
3. Press the red relay STOP button.
4. Check that the motor turns off.
5. Reset the motor with the blue reset button.



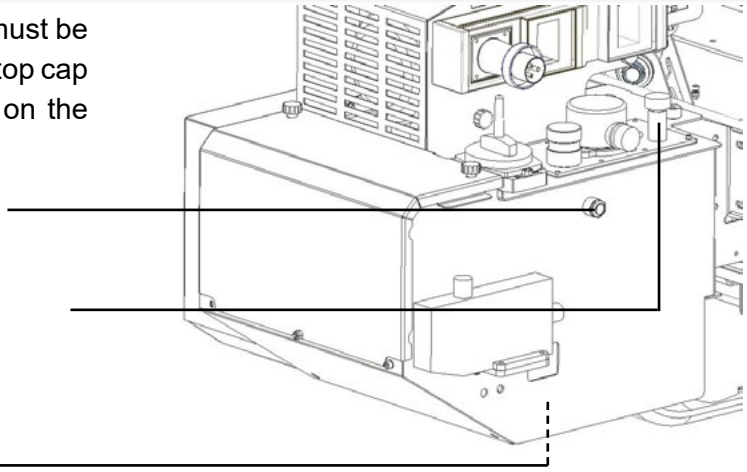
Checking of the plates and stickers

Check the presence and legibility of all plates and stickers.

Check the oil level and replace

The oil level check and any topping up must be carried out with the platform completely lowered.

Check the oil level from the indicator; it must be in the middle. If necessary top up via the top cap with oil of the same viscosity indicated on the tank.



The conditions of use of the machine and the quality of the hydraulic oil used eliminate the need to prescribe oil replacement at regular intervals. During the checks, check that the oil maintains its characteristics of clarity, colour and viscosity; if necessary, replace it.

However, IMER recommends replacing the oil completely every 3 years.

Complete oil replacement must be carried out with the machine stowed away.

For the total discharge of the oil, the tank is provided with a cap located under the tank itself.

- Discharge all the oil from the tank into a dedicated container.
- Close the drain plug.
- Add new oil from the filler cap.

Hydraulic oil is a polluting product.

Avoid the leakage of hydraulic fluid using collection tanks and guard against accidental leakage and spilling of hydraulic fluid with oil-absorbing products.

Used oil must be collected and not dispersed in normal drain pipelines; specialised companies are responsible for disposing of or possibly recycling industrial oils, under the protection of the laws in force in the individual countries.

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Replacing the oil filter cartridge

The first replacement of the cartridge must be carried out after the first 50 h of work to remove from the hydraulic system the processing residues of the pipes and hydraulic components.

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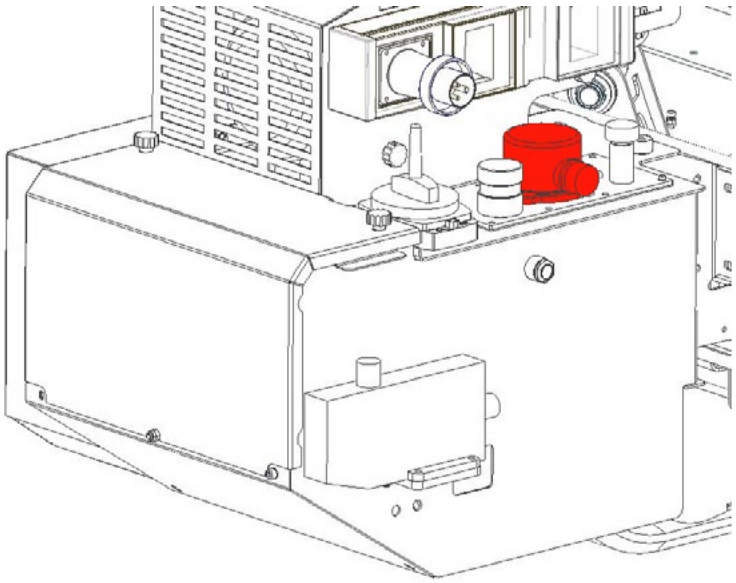
The cartridge must be replaced:

- at each oil change;
- according to the times provided in the maintenance table;
- when error code 556 appears on the push-button panel display and all movements are slowed down.



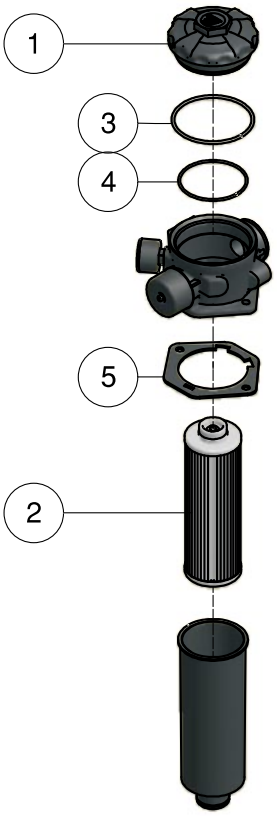
Before carrying out the operation make sure that the machine is switched off and completely lowered.

The operation involves the spillage of hydraulic oil and it is therefore advisable to equip yourself with containers for collection.

Filter unloading

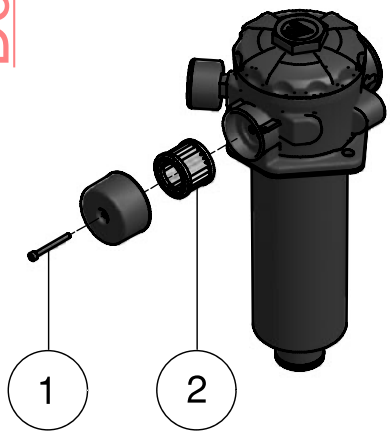
- Lift the distribution boom.
- Lower the distribution boom and during the descent check that the oil filter pressure gauge indicates a pressure below 1.6 bar (green area).
- If the pressure is higher, replace the filter cartridge.

Cartridge replacement



- Unscrew the upper filter cap (1).
- Remove the filter cartridge (2).
- Make sure that no particulate residues are deposited in the bottom of the container.
- Check that the O-rings (3 - 4) and gasket (5) are not damaged, otherwise replace and consequently correctly position them.
- Insert the new filter cartridge lubricating the sealing O-Ring beforehand.
- Screw on the cover paying attention to the thread inlet. Tighten with tightening torque of 30 Nm.
- Restart the machine for a few minutes.
- Make sure there are no leaks.
- Repeat the filter check operation.

Air vent filter



The air filter must be replaced each time the discharge filter cartridge is replaced.

For work in very dusty environments it is necessary to replace it more frequently.

Replacement

Remove the metal cap retaining screw (1).

Replace the air filter (2) and tighten the cap again, taking care not to overtighten to avoid crushing of the filter itself.

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Greasing of the moving parts

Coupling

- 3 greasers on the worm screw.
- 2 greasers at the sides of the toothed wheel carriage.

Stabilisers

- 1 on the cylinder.
- 1 on the pin.

Chassis

- All the cylinder pins have a grease nipple.

Check of screws tightening

DESCRIPTION	TYPE	Quantity	Tightening torque	
			Nm	kgm
Screws for fixing of the coupling to the turret	M16X110 UNI5931	12	250	25
	M16X60 UNI5739	4	250	25
Screws for fixing of the traction engine to the track-holder	M10x25 UNI5931	16	50	5
Screws for fixing of the motor to the traction wheel	M10x30 UNI5931	16	50	5

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Starter battery

The AGM battery does not require electrolyte level verification.

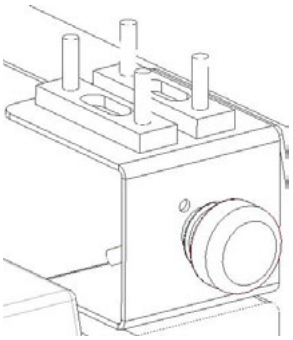
Clean the clamp contact surfaces, lubricate with antacid grease or petroleum jelly.

Battery charging

The battery charge level is visible on the push-button panel.

To recharge the battery, see paragraph "Recharging the battery".

Replacing the battery



- The battery is housed in the front of the carriage.
- Turn the battery disconnector OFF.
- Open the battery compartment protective cover.
- Disconnect the terminals from the battery always starting from the negative pole (-).
- Reattach the electrical cables always starting from the positive pole (+).

Replace the battery with one of equivalent characteristics.

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Checking of safety devices

The following test verifies the correct operation of all the safety devices of the machine.

The safety systems applied to the machine are inevitably subject to wear and calibration. It is therefore essential to monitor them and to keep them in a state of efficiency; it is also incorrect to blindly rely on their operation in the evaluation of operating and safety conditions.

Their presence cannot exempt the operator from responsibility for informed and adequate use of the machine.

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Red emergency stop button

- Press the emergency stop button from the ground control panel and check that no operation is possible either from the ground or from the platform. Return the button to the ON position.
- Press the emergency stop button from the push-button panel and check that no operation is possible from the ground or platform. Return the button to the ON position.

Combustion engine speed

Before carrying out the check, make sure there are no obstacles in the immediate vicinity of the machine.

None of the 4 stabilisers must be under pressure; the engine to be used is the combustion engine.

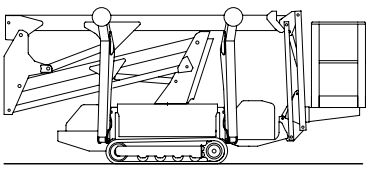
Start the test from the machine stowed away.

- From the push-button panel start the engine. Raise the arm until it stops. Check that the engine is not accelerated.
- Lower the arm until it is fully retracted, check that the engine can be accelerated.

Microswitches

SQ12

1. Bring the machine to the ***STOWED AWAY*** configuration and check that the icon push-button panel turns on:



2. In the machine ***STABILISED AND STOWED AWAY*** configuration, lift the main boom and exit the stowed away position: check that turret rotation is enabled.

Emergency manual movements control

See paragraph “Emergency manual movements”.

Checking the brakes

Good seal

The parking brakes must be able to hold the machine on the possible slope indicated in the “Technical data” table.

Check the good tightness of the brakes on a ramp with slope shown in the table above, in both directions.

Braking spaces

Perform the tests with the machine on level ground, with the combustion engine on and the engine speed on “hare”.

FAST GEAR

- Select the fast gear from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Release the manipulators and check that the braking space is less than 60 cm.

SAFETY GEAR

- Select the safety gear from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Release the manipulators and check that the braking space is less than 10 cm.

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Checking of structures

General

- Check the oxidation protection status of the mechanical structures and, if necessary, restore any rusty areas.

Base carriage

- Visually check the most important welds with penetrating liquids.
  - Load-bearing structure.
  - Wheel supports.
  - Joint pins.
  - Bushings; if necessary replace them by lubricating with grease.
  - Track status.

Turret and column

- Visually inspect or use liquid penetrant to check the most important welds (main boom hinge support).
- Check the correct positioning and fastening of the various components (fifth wheel, main boom hinge pins, etc.).
- Check the correct positioning and fastening of the ballasts.
- Check the condition of the fifth wheel and of the rotation pinion.

Distribution boom

- Visually inspect or use liquid penetrant to check the most important welds (main boom, second boom, third boom).
- Check the correct positioning and fastening of the various components (hinge pins, couplings, etc.).

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Checking of hydraulic pipes

Hydraulic oil is a polluting product.

Avoid the leakage of hydraulic fluid using collection tanks and guard against accidental leakage and spilling of hydraulic fluid with oil-absorbing products.

- Visually check all the hydraulic joints and tighten the fittings if necessary.
- Check the condition of the flexible hydraulic hoses; replace them if necessary.

Checking the power and auxiliary cables

Check the tightness of the electrical terminals, the correct positioning of the cables, the absence of corrosion and abrasion.

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Checking of performance

To carry out the checks shown below, it is necessary to use a stopwatch.

Perform the tests with the machine on flat ground, with the engine running.

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Safety mode

- Select the safety mode from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Check that the machine travels the distance of 10 m in a time greater than 65 s.

Lifting / lowering of the main boom

- Using the push-button panel lift the main boom and check that it takes about 40 s to complete the lifting movement.
- Lower the main boom and check that it takes about 30 s.

Turret rotation

- Select the turret rotation from the ground control panel and verify that it takes:
  - approx. 100 s to perform full rotation to the right;
  - approx. 100 s to perform full rotation to the left.

Opening / closing of the second boom

- Using the push-button panel open the second boom and check that it takes about 40 s to complete the movement.
- Close the second boom and check that it takes about 35 s.

Opening / closing of the third boom

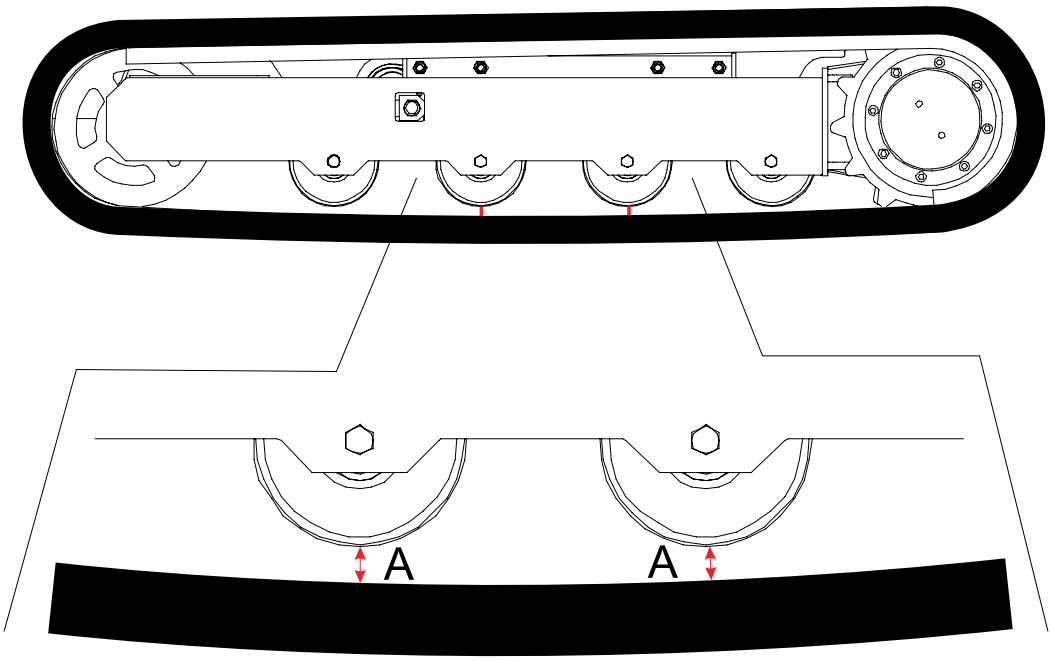
- Using the push-button panel open the third boom and check that it takes about 20 s to complete the movement.
- Close the third boom and check that it takes about 15 s.

Rubber tracks maintenance

Track tension check

- Bring the machine to solid and flat ground.
- Perform machine stabilisation.
- At the 2 central rollers measure the distance A between the outer part of the roller and the inner part of the rubber crawling track.

The tension is normal if the distance is between 10 and 15 mm.



If the value of A is not within the indicated values, the crawling track is loose or in tension; see the next paragraph “How to loosen - tension the crawling track”.

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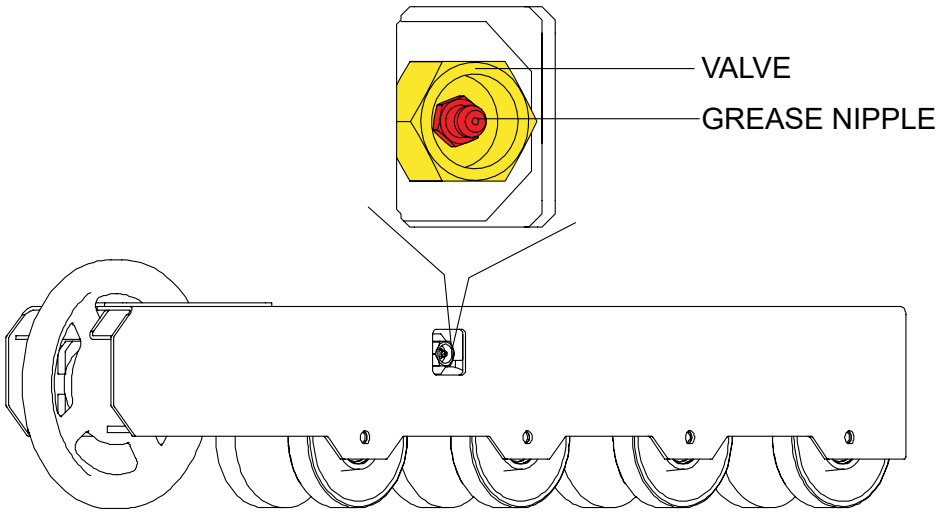
How to loosen - tension the crawling track

Perform the operations with the machine stabilised.

The grease contained in the hydraulic crawling track is under pressure. Do not loosen the valve by more than one turn; if the valve is loosened too much, it may be ejected under the effect of grease pressure. Never loosen the grease nipple.



To loosen the crawling track:

- slowly unscrew the valve anti-clockwise by no more than 1/2 turn to drain the grease; if grease does not come out, slowly rotate the crawling track;
- when the correct crawling track tension has been obtained screw and tighten the valve, turning it clockwise;
- clean away any grease that has leaked out.

To tension the crawling track:

- connect a grease gun to the grease nipple;
- add grease until the crawling track tension reaches the correct value.

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How to replace the crawling tracks

The following operations should be completed with the machine stabilised.

The grease contained in the hydraulic system is under pressure.
Do not open the valve more than one turn; if the valve is too much loosened up,
the pressure of the grease may eject it. The greaser may never be left open.

- Widen the span of the crawling tracks.
- Complete the following operation to loosen up the crawling track due for replacement:
  - slowly open the valve in the anticlockwise direction, not more than half a turn, to drain the grease. If the grease does not come out turn the crawling track slightly.
- Take the crawling track out.
- Before fixing a new crawling track, make sure that the direction of the drive is correct.
- Match the track links with the toothed wheel and then place the track of the tension wheel.
- Rotate the driving wheel in the reverse gear.
- Make sure that the links of the crawling track are correctly matched with the toothed wheel and the tension wheel.
- Adjust the tension of the crawling track.

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Check couplings

Check the tightness of the couplings:

- if a coupling shows traces of concrete, it means that it is not sealed properly;
- check that the gasket is correctly positioned;
- if the gasket is worn, replace it;
- check the condition of the lever couplings every day and replace them immediately with equivalent ones if they are deformed in any way.

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Rotate the pipes

It is advisable to rotate the pipes on their axis once a week to even out wear and increase their service life:

- rotate all concrete pipes by 120° clockwise and the elbows by 180° in order to even out wear and increase their service life;
- comply with the minimum values indicated in the “Check pipes for wear” chapter.

Check pipes for wear

Check the thickness of the concrete pipes using a thickness gauge:

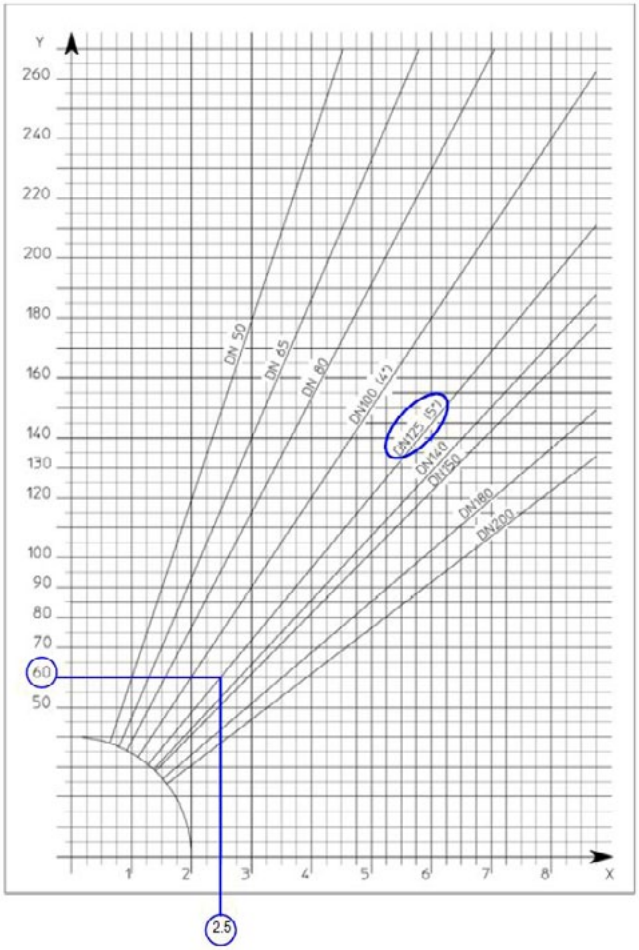
- if the measured thickness is less than the value indicated in the table, replace the worn parts with original spare parts.

X axis = minimum thickness of the walls [mm]
Y axis = working pressures [bar] (*) on concrete
PL = Working pressure
DN = Nominal diameter

Example of reading
PL = 60 [bar] (*)
DN = 125 [mm]

Draw a horizontal line at 70 on the Y-axis until it crosses the DN 125 line.
From the point of intersection, draw a vertical line until it crosses the X-axis which determines the minimum thickness of the pipe = 2.5 [mm].

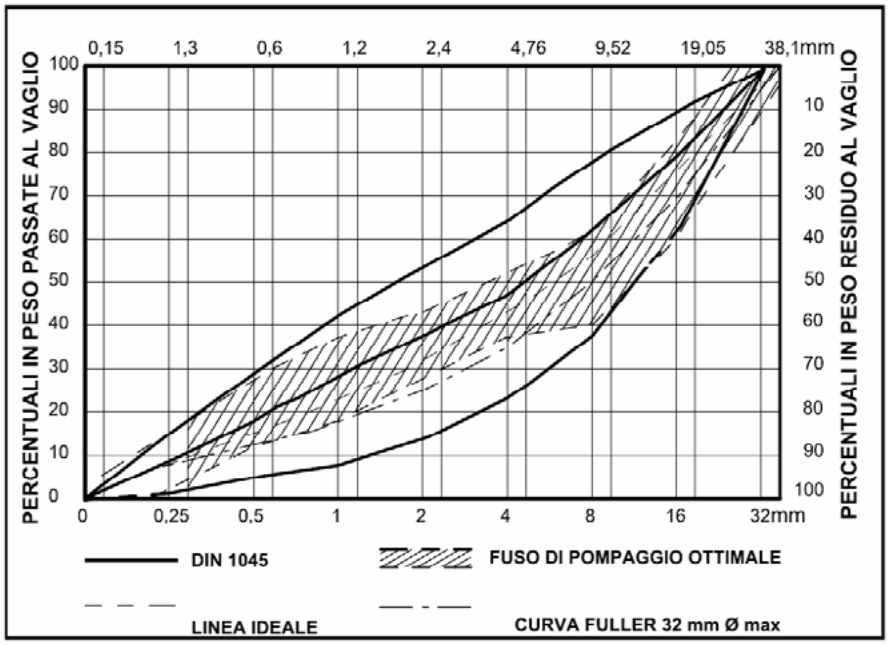
(*) 1 bar = 0.1 MPa



General notes on the different types of concrete in use

The following notes are not intended to provide specific information on concrete, but are intended to provide useful information for recognising and identifying different mixtures.

In order for concrete to be pumped and flow smoothly through the pipes, it must have certain characteristics that guarantee pumpability.



Concrete essentially consists of four elements:

1. cement;
2. sand;
3. aggregates;
4. water.

The composition in relation to cement

Concrete can be divided, in broad terms, into three major categories:

- **RICH CONCRETE**: the cement content is greater than 370 kg/m^3: high pumpability index;
- **MEDIUM CONCRETE**: the cement content is between 300 - 370 kg/m^3: it has a good pumpability index and meets most construction requirements;
- **LEAN CONCRETE**: the cement content is less than 300 kg/m^3; the cheapest type, its pumpability decreases rapidly in relation to the cement content, so more precautions should be taken while casting.

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The function of cement in relation to pumpability

Regardless of its main function, i.e. being a binding element, cement, in terms of pumpability acts as a lubricant, significantly reducing the friction created between the aggregates and the piping.

Low cement contents may have a negative effect on the mechanical strength of the casting, worsening the pumpability of the concrete due to internal friction.

- **Low cement content**: increased friction, poor pumpability and possibility of clogging.
- **Correct cement content**: low friction, excellent pumpability, no clogging.
- **High cement content**: good lubrication, increased viscosity, increased pressure drops.

Having made this initial classification in relation to the cement content in concrete, it is necessary to point out that it is not sufficient to guarantee good pumpability, although it contributes to it.

It is understood that not all cements have the same characteristics, so the effects are not the same.

The cement production method (Portland, Pozzolanic, Blast Furnace) and its classification with respect to grinding (fine, medium and coarse, long and short cements) lead to the need to prefer the Portland type and long cements to short ones.

Portland cement retains water well thanks to its ability to amalgamate with it; other types do not give the same results so the water tends to separate and, as they say in jargon, the concrete “cries”; of course, this effect can make pumping difficult.

The composition in relation to sand

Good sand not only improves the concrete in terms of quality, but also reduces the cost of the concrete by saving cement and, above all, **makes the concrete much more pumpable**.

Of course, the sand must have a good grain size curve (contain the various grain sizes in the right proportions).

For good pumpability, the sand should contain very fine parts, the size of which is below 0.2 mm. Usually, 7-12% in weight is a good content.

Aggregates

Aggregates can be classified into two groups:

1. natural gravel;
2. crushed stone.

Natural gravel

It consists of aggregates with rounded edges, roughly spheroidal in shape due to wear over time in nature. **It is very suitable for pumping** because, thanks to its shape, it creates minimal friction both between the aggregates themselves and between the aggregates and the piping.

A well-proportioned concrete can contain aggregates with a maximum dimension of 1/3 of the pipe diameter.

If the proportion of larger aggregates is 10% or less of the total, the aggregate size can be slightly increased.

Crushed stone

Apart from the difficulty for some construction sites of having natural gravel available, the current trend leads to a preference of crushed aggregate whose origin (rock) is known and whose hardness (strength) is classified according to the type of rock (basaltic, granitic, dolomitic, etc.).

Crushed aggregate leads to **increased wear** for the following reasons:

1. shape of the aggregate;
2. hardness of the aggregate.

When crushed, the aggregate is characterised by sharp edges, which, when in contact with the metal of the pipes, breaks the lubricating film formed by the cement and behaves a bit like a cutting tool that gradually digs into the metal surface.

It is advisable to reduce the maximum pumping speed to increase the service life of the components.

Water

The correct dosage of water is very important and it is usually defined by the water-cement ratio.

For the chemical reaction of cement hydration to take place, a water content of 30 litres per 100 kg of cement is sufficient.

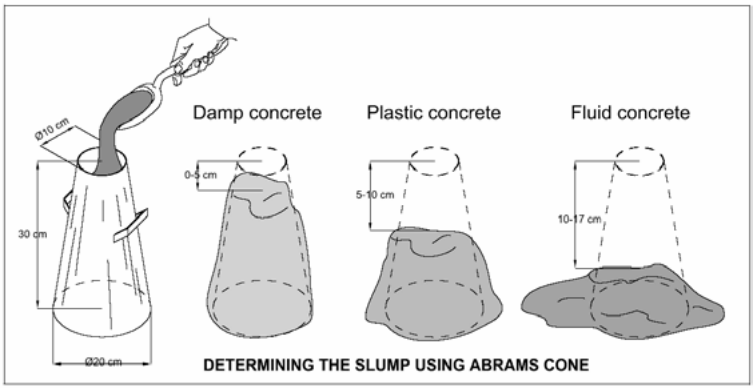
However, in practice, this amount of water is increased due to the need to obtain a sufficiently plastic and therefore workable mixture.

It should be remembered that, in any case, the minimum amount of water compatible with the desired degree of workability must be used, as beyond a water-cement ratio of 0.30, the final strength of the concrete decreases in inverse proportion to this ratio.

Depending on the type in use, this consistency can have a different value.

High consistency

Precast panels, formwork, beams, etc. Casting requires vigorous vibration and the water-cement ratio is about 0.4%; the slump values are around 3-8 cm.



DETERMINING THE SLUMP USING ABRAMS CONE

Low consistency

Roofing slabs, castings with closely spaced reinforcements, etc. Significant vibration is not required; the slump values are usually between 10 and 15 cm.

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5. INSPECTION BOOKLET

MACHINE DELIVERY TO THE FIRST OWNER

The crawler distribution boom type _____

with factory number: _____

and construction year _____

referred to in this check register has been delivered by _____

_____

On _____

to Messrs: _____

_____

according to the terms agreed upon in the contract, with the technical, size and functional characteristics specified in the Operating Handbook.

SUBSEQUENT CHANGES OF OWNERSHIP

On _____

The ownership of the crawler distribution boom mentioned above is transferred to the Firm/Company:

_____

_____

It is hereby certified that on the date mentioned above the technical, dimensional and functional characteristics of this crawler distribution boom are consistent with the originally envisaged ones and that changes, if any, have been reported in this Register.

The Seller	The Buyer
_____	_____

SUBSEQUENT CHANGES OF OWNERSHIP

On _____

The ownership of the crawler distribution boom mentioned above is transferred to the Firm/Company:

_____

_____

It is hereby certified that on the date mentioned above the technical, dimensional and functional characteristics of this crawler distribution boom are consistent with the originally envisaged ones and that changes, if any, have been reported in this Register.

The Seller	The Buyer
_____	_____

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REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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VERIFICATION OF PERIODICAL MAINTENANCE

The user must comply with the maintenance and surveillance obligation described in this operating handbook.

NR.	Date	Description of intervention	SIGNATURE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			

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NR.	Date	Description of intervention	SIGNATURE
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
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48			
49			
50			

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IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

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IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

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IMER International S.p.A.

Registered and administrative office
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

Operational Headquarters
Equipment division
Via della Meccanica, 39 (Zona Industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

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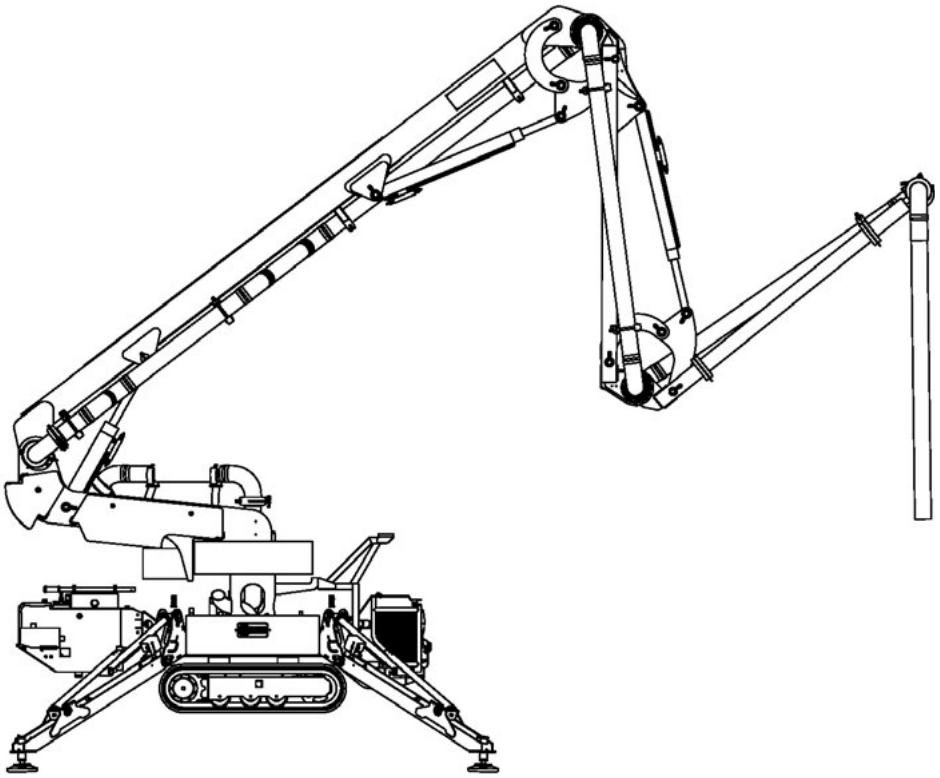
SELF-PROPELLED CRAWLER CONCRETE DISTRIBUTION BOOM USE AND MAINTENANCE MANUAL

MUM GERRIS 800 US R01 05/2023

GERRIS 800



TRANSLATION OF THE ORIGINAL INSTRUCTIONS

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IMER International S.p.A.

Registered and administrative office
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

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Equipment division
Via della Meccanica, 39 (Zona Industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

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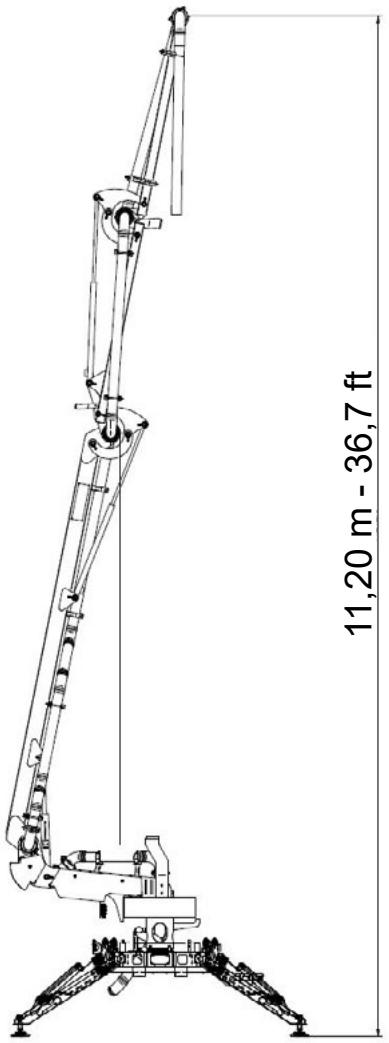
1. INTRODUCTION

This volume contains the use and maintenance manual of the self-propelled crawler concrete distribution boom:

GERRIS 800



Designed and manufactured with:

- petrol engine;
- hydraulic operation and proportional controls;
- remote control by radio remote control.

GERRIS 800 reaches a height of 36,7 ft and can be used both outdoors and indoors.

Only trained and authorised personnel may use this machine.

The purpose of the use and maintenance manual is to provide the necessary instructions for correct and safe use of the machine to avoid serious damage to yourself and to others.

All the information in this manual is mandatory and must be read carefully and understood before starting to use the machine.

The use and maintenance manual is an important work tool and must be stored in the appropriate compartment and be available at any time.

All texts highlighted by the frame provide safety warnings and should be read with particular attention.

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Static and dynamic tests

Prior to commissioning, the static and dynamic tests required by the harmonised standard EN 280 in section 6.3 have been carried out.

Assistance service

For interventions, repairs and servicing, contact the authorised workshops. For further information, contact the Technical Assistance Service.

Spare parts service

A guarantee of good operation and durability can only be achieved by using original spare parts; for this purpose consult the “SPARE PARTS CATALOGUE”.

In the requests for spare parts as well as in the request for interventions always mention the data shown on the identification plates located on the chassis.

Responsibility

IMER International S.p.A. will remain exempt from any liability and obligation for any damage caused to persons or property due to one of the following reasons:

- failure to comply with the instructions indicated in this USE AND MAINTENANCE MANUAL with regard to operation, use and maintenance of the machine;
- incorrect manoeuvres in use and maintenance of the machine;
- changes made to the structure or components of the machine without prior authorisation from IMER International S.p.A. and/or without the use of appropriate equipment;
- events unrelated to normal and correct use of the machine described in this USE AND MAINTENANCE MANUAL;
- the use of non-original spare parts not authorised by the manufacturer.

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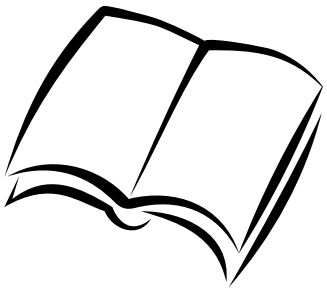
General safety recommendations

Manual



Adequate safety at work is essential to avoid serious personal harm and harm to others. It is therefore necessary to read and understand this manual which provides basic and precise instructions for use of the machine and for maintenance operations.

This manual is to be considered as part of the machine. It must always remain on board and be kept for subsequent reference.

The user manual must be kept by the user throughout the life of the machine, even in case of loan, rental or resale.

The images shown in this manual DO NOT always reproduce exactly the model described but are used for greater and easier understanding of the text.

Safety systems

The safety systems applied to the machine are inevitably subject to wear and calibration. It is essential to monitor them and to keep them in a state of efficiency. It is incorrect to rely blindly on their operation in the assessment of operational and safety conditions.

Their presence cannot exempt the operator from responsibility for informed and adequate use of the machine.

It is strictly forbidden to remove, modify or tamper with parts of the self-propelled distribution boom that are important for safety and stability.

Any tampering with the main parts and with the safety devices of the self-propelled distribution boom will invalidate the warranty conditions immediately.

If a safety-relevant defect is found, it must be recorded in the inspection booklet and the manufacturer must be informed in writing.

Labels and plates

Potential hazards and requirements concerning the machine are indicated by labels and plates; it is therefore necessary to ensure that they are legible and in a good condition.

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Operator requirements

Only trained and authorised personnel may use this machine.

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The operator must:

1. have readand understood all the documentation annexed to the machine, be instructed in correct use of the machine and be aware of the safety devices and regulations;
2. be physically fit and must not use drugs, alcohol or medication that could affect their attention, reaction, vision or hearing;
3. always give priority to safety and refuse to operate when they feel they cannot work safely;
4. when working at a height, use suitable fall arrest systems;
5. always have a suitably trained ground assistant in areas lacking a clear view;
6. always use an assistant in areas where visibility is obstructed;
7. always work in maximum safety, order and cleanliness;
8. before using the machine, check the controls and safety devices daily and make sure they are effective and efficient;
9. check that the work area is free from persons, animals and obstacles before carrying out any movement of the machine;
10. check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards;
11. always remove the key at the end of work and when the machine remains unattended in order to prevent unauthorised persons from using it in any way;
12. remove the key when work is finished or during breaks, in order to avoid unauthorised or unintentional use. A spare key must be kept by the safety manager so that the ground control station can be used as an emergency station (in the event of a fault, emergency descent is possible).

In particular

- Be aware that remotely controlled tracked machine can only be used by qualified personnel.
- Do not hand over the push-button panel to persons who have not received adequate training.
- Become familiar with the symbols and positions of the levers for the performing of functions and movement.

- Always check, before starting work, the functionality of the emergency stop button on the push-button panel.
- When moving the machine, use the push-button panel from the ground to remain at an appropriate distance from the machine. Unauthorised persons must not remain inside the work area of the machine.
- Release all levers if the movement of the machine becomes uncontrollable and immediately press the emergency stop button on the push-button panel.
- Always press the emergency button on the push-button panel when the unit is not in use. This also applies to short interruptions.
- Always press the emergency button on the push-button panel at the end of the work. The push-button panel must be kept out of the reach of unauthorised persons.
- Repairs, maintenance work, etc. must be carried out with the boom stationary and resting on a suitable support; if necessary, stabilise and level the machine using the special hydraulic stabilisers.

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Distance from power lines

The machine is not electrically insulated and does not offer any protection against contact with active parts of unprotected or insufficiently protected power lines and electrical systems.

Below is a table of the safety distances to be complied with according to Italian law.

In other countries there may be laws with different limitations that the operator must respect.

Un (kV)	**Minimum permitted distance** (m)	
da 0 a 300V	avoid contact	
da 300V a 50kV	10ft	3.05m
da 50kV a 200kV	15ft	4.60m
da 200kV a 350kV	20ft	6.10m
da 350kV a 500kV	25ft	7.62m
da 500kV a 750kV	35ft	10.67m
da 750kV a 1000kV	45ft	13.72m

Un = rated voltage

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Non-permitted operations

It is strictly forbidden to use the machine:

- driving on public roads;
- in the event that the ambient lighting does not guarantee sufficient visibility to carry out the work or to move safely;
- in case of severe thunderstorms, with or without rain, or with a wind speed greater than 12,5 m/s, sixth degree of the beaufort scale below;
- moving with the hoods open;
- if the work area is not clear of obstacles that could cause hazardous conditions;
- coming into contact with fixed or movable objects;
- in poor working condition;
- contrary to the user instructions;
- using the distribution boom as a crane or mechanical boom to move loads;
- altering or removing the safety devices;
- attaching it to adjacent structures;
- in an environment with insufficient ventilation and in atex environments;
- in the presence, in the entire work area, of unauthorised personnel; if this is the case, they must be sent away.

In addition, the following are forbidden:

- moving the aerial part when the machine is on the platform of a truck or other vehicle;
- using the boom for purposes other than unloading and distributing concrete, mortar, sand, gravel or similar materials with a specific weight not exceeding 150 lb/ft^3;
- standing or walking within the operating range of the boom while it is being moved, used or maintained; keep a safe distance;
- climbing onto the machine to get on it;
- jumping from the machine to get off it;
- changing the diameter of the pipes secured to the boom structure and used for concrete distribution;
- using pipes of a different diameter than those supplied, which would change the load on the boom;
- connecting extensions to the concrete pipes of the boom;
- changing the length and the dimensions of the rubber end hose, connecting extensions or other devices;
- bending the rubber end hose or immersing it in concrete during pumping operations.

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Beaufort wind scale

	Wind description	Wind speed (km/h)	Wind speed (m/s)	Sea conditions	Ground conditions
0	Calm	0	0	Calm sea (mirror)	Smoke rises vertically
1	Gust of wind	1-6	0.3-1.5	Light ripples on the surface resembling fish scales. No white foam ridges yet.	Wind motion visible in smoke.
2	Light breeze	7-11	1.6-3.4	Minute waves, still very short but very obvious. The crests do not break yet, but they look glassy	The wind can be felt on bare skin. Leaves rustling
3	Light breeze	12-19	3.4-5.4	Waves with crests that begin to break with glassy foam. Wave foaming evident with a white foam crest.	Smaller leaves and branches in constant motion
4	Moderate wind	20-29	5.5-7.9	Waves tending to extend. Wave foaming is more frequent	Lifting of dust and paper. Branches are shaken
5	Stiff wind	30-39	8.0-10.7	Moderate waves with an elongating shape. Plentiful wave foaming and there is a possibility of sprays.	Swaying of bushes with leaves. Small waves form in inland waters.
6	Fresh wind	40-50	10.8-13.8	Large waves (rolling) with foam-white crests. Sprays are likely	Movement of large branches. Difficulty using umbrella.
7	Strong wind	51-62	13.9-17.1	Rolling waves becoming bigger. The foam formed by the breaking of waves is “blown” in strips in the direction of the wind.	Whole trees shaken. Difficulty walking against the wind
8	Gale	63-75	17.2-20.7	High waves. The crests break and form swirling sprays that are sucked in by the wind	Twigs torn from trees. It is generally impossible to walk against the wind
9	Strong gale	76-87	20.8-24.4	High waves with crests that begin to roll. Foam strips that become thicker.	Slight damage to structures (chimneys and tiles removed).
10	Storm	88-102	24.5-28.4	Very high waves topped by very long (swells) crests. The foam strips tend to compact and the sea looks whitish. The breakers are much more intense and visibility is reduced.	(Rare onshore) Tree uprooting. Considerable structural damage.
11	Violent storm	103-117	28.5-32.6	Huge waves that could even hide medium-sized ships from view. The sea is covered with foam banks. The wind mists the summits of crests and visibility is reduced.	Severe devastation. Extensive structural damage
12	Hurricane	> 117	> 32.5	Very high waves; air full of foam and spray, sea completely white	Very serious catastrophes Extensive and substantial damage to structures

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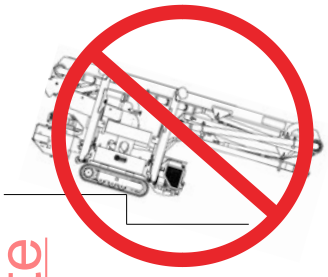
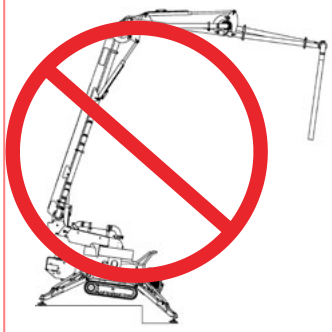
To reduce risks

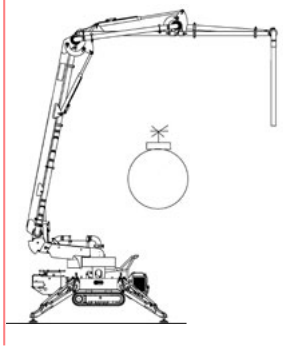
Follow the instructions below



Overturning risks

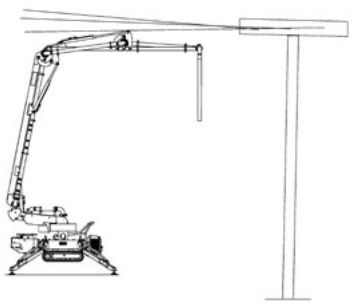
- Check that the soil is of proven consistency and solidity.
- Do not use the machine on slippery, icy, muddy or uneven ground or in the presence of holes, which have a slope greater than the permitted limit.
- Maintain a distance of at least 2 m from steep slopes (ditches, steep terrain, etc.).
- Check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards.
- Avoid collisions against fixed or mobile obstacles.
- Do not use the machine as a crane, with materials suspended from the lifting structures.
- During all movements check that there are no obstructions around, above or below the machine.
- Move only if the visibility of the workspace is complete.
- Do not apply elements (e.g. panels) to the machine that increase wind exposure.





Risk of explosions or burns

- Do not use the machine near naked flames or heat sources.
- Recharge batteries in ventilated environments, away from heat sources and explosive liquids.
- Do not use the machine if it has oil leaks.
- Do not use the machine in environments with an explosive atmosphere.
- Turn off the engine during refuelling.
- Refuel in a well-ventilated area.
- Dry any spilled fuel.
- Do not smoke while refuelling.



Electrical hazards

- As the machine is not electrically insulated, special care must be taken by the user to avoid any contact with potentially live parts.
- Work may not be carried out near power lines at a distance less than that indicated in the table on page 14.

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Risks related to the use of the distribution boom

- Periodically check the thickness of the pipes (see the “Maintenance” chapter).
- Should it be necessary to replace them, use original spare parts only.
- The performance of the pump must be suitable for the size of the pipes and couplings.
- The couplings must not be opened during pumping operations and, before opening them, the pipes themselves must be depressurised by sucking out the concrete.
- Firmly close the couplings after laying the pipes.
- Grout leaks indicate wear or deformation of the coupling-gasket-pipe assembly.
- It is advisable to rotate the pipes on their axis once a week to even out wear and increase their service life (see the “Maintenance” chapter).
- Check the condition of the lever couplings every day and replace them immediately with equivalent ones if they are deformed in any way.
- Never open the lever couplings when the pipes are pressurised; carry out the suction manoeuvre for at least 30 seconds first.
- Even after this manoeuvre, always keep your face and limbs away when opening the lever couplings to avoid being hit by any residual pressurised concrete.
- The lever couplings of the concrete pipes must be closed and locked using the appropriate pin.

Risks related to the distributor becoming clogged

Clogging is the condition in which the concrete flow tends to become blocked as a result as an obstruction in the pipe. In order to overcome the resistance created by the obstruction, the hydraulic circuit rises to its maximum value, thus creating extremely dangerous conditions. In this condition, by continuing to push, the pads may unblock the obstruction; the result is a “water hammer” effect which discharges onto the rubber end hose, triggering a potentially fatal whiplash.

- **A further serious risk, in the event of pressure peaks during pumping due to an obstruction, is the possible explosion of particularly worn sections of the pipe** (see the table showing the minimum permissible values, in the “Maintenance” chapter).
- The operator must report any symptoms of clogging in good time and, at the first abnormal rise in pumping pressure, stop the pump and the suction action.
- Pumping must then be resumed at low speed and very carefully.
- If clogging is occasional, pumping can almost certainly be resumed thanks to this manoeuvre.
- If the blockage is not eliminated, suck out all the concrete in the pipe to relieve the pressure, switch off the machine and remove the section of pipe affected by the blockage.

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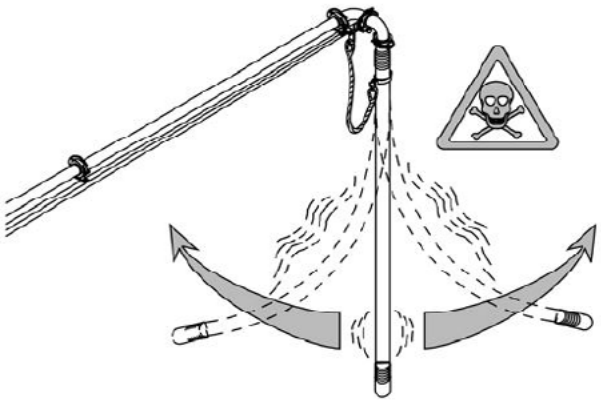
Risks related to the use of the rubber end hose



The rubber end hose must remain anchored to the last element of the distribution boom by means of the safety cable.

It is forbidden to manoeuvre or hold the rubber end hose.

Do not stand within the operating range of the rubber end hose.

The sudden release of any blockages may result in violent whiplash.

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Residual risks

The plates and stickers listed below indicate the residual risks that remain despite the protective measures integrated into the design of the machine and the safety devices adopted:

- risk of crushing;
- concrete splashes;
- pressurised hydraulic oil leaks;
- violent contact with the end hose due to sudden movements of the same;
- contact with hot parts.

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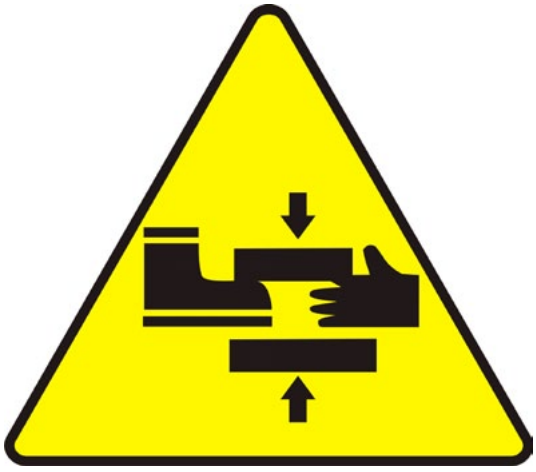

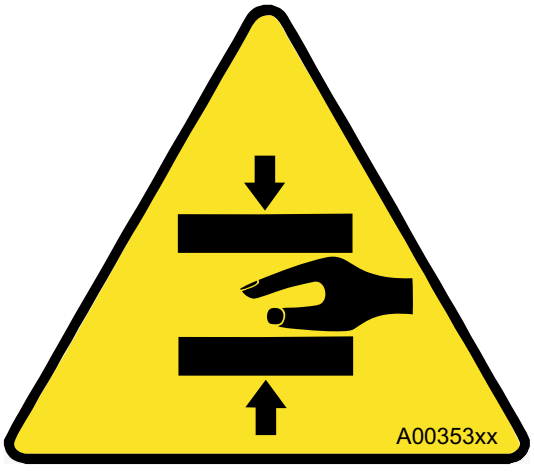

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2. DESCRIPTION OF THE MACHINE

The self-propelled crawler distribution boom GERRIS 800 is used for concrete distribution in any position within its working radius (see WORKING DIAGRAM on page 34), both outdoors and indoors.

It must be used in compliance with the technical data shown in the appropriate table, on soils of proven consistency and solidity and in conditions of verified operational safety by the Qualified Operator.

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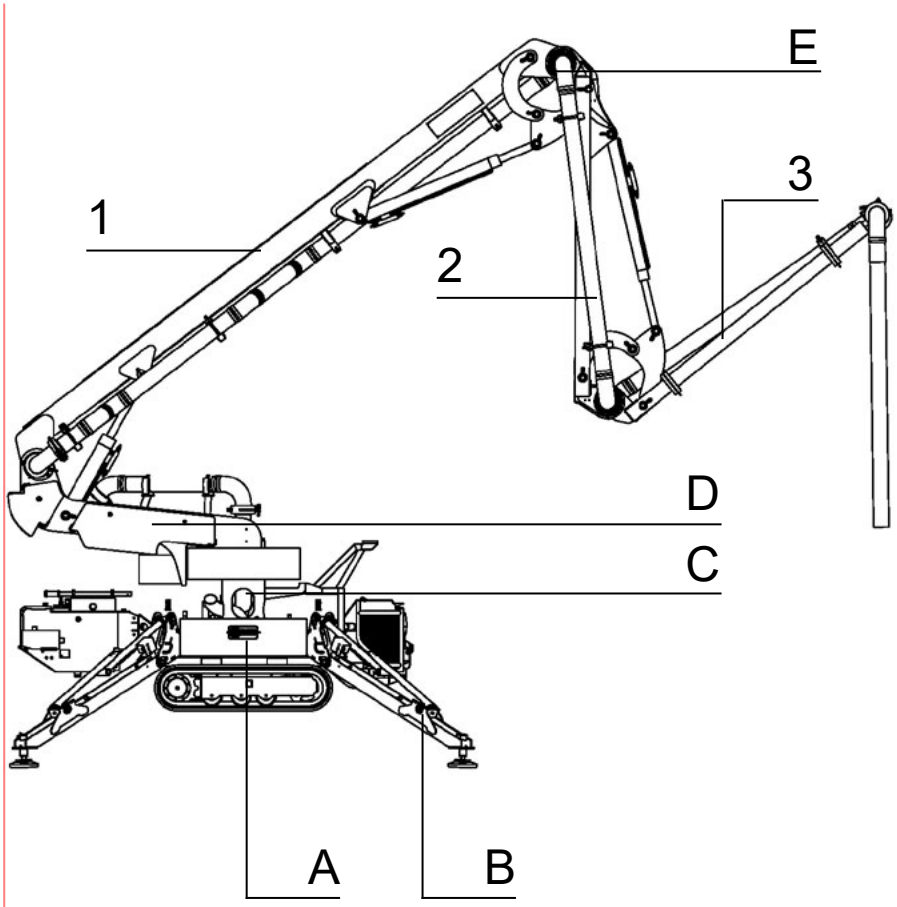

It consists of:

A. Base carriage
B. Stabilisers
C. Column
D. Turret
E. Distribution boom

The distribution boom lifting system 'E', supported by the turret, consists of 3 main structures operated by hydraulic cylinders:

1. Main lifting boom
2. Second boom
3. Third boom

Main components

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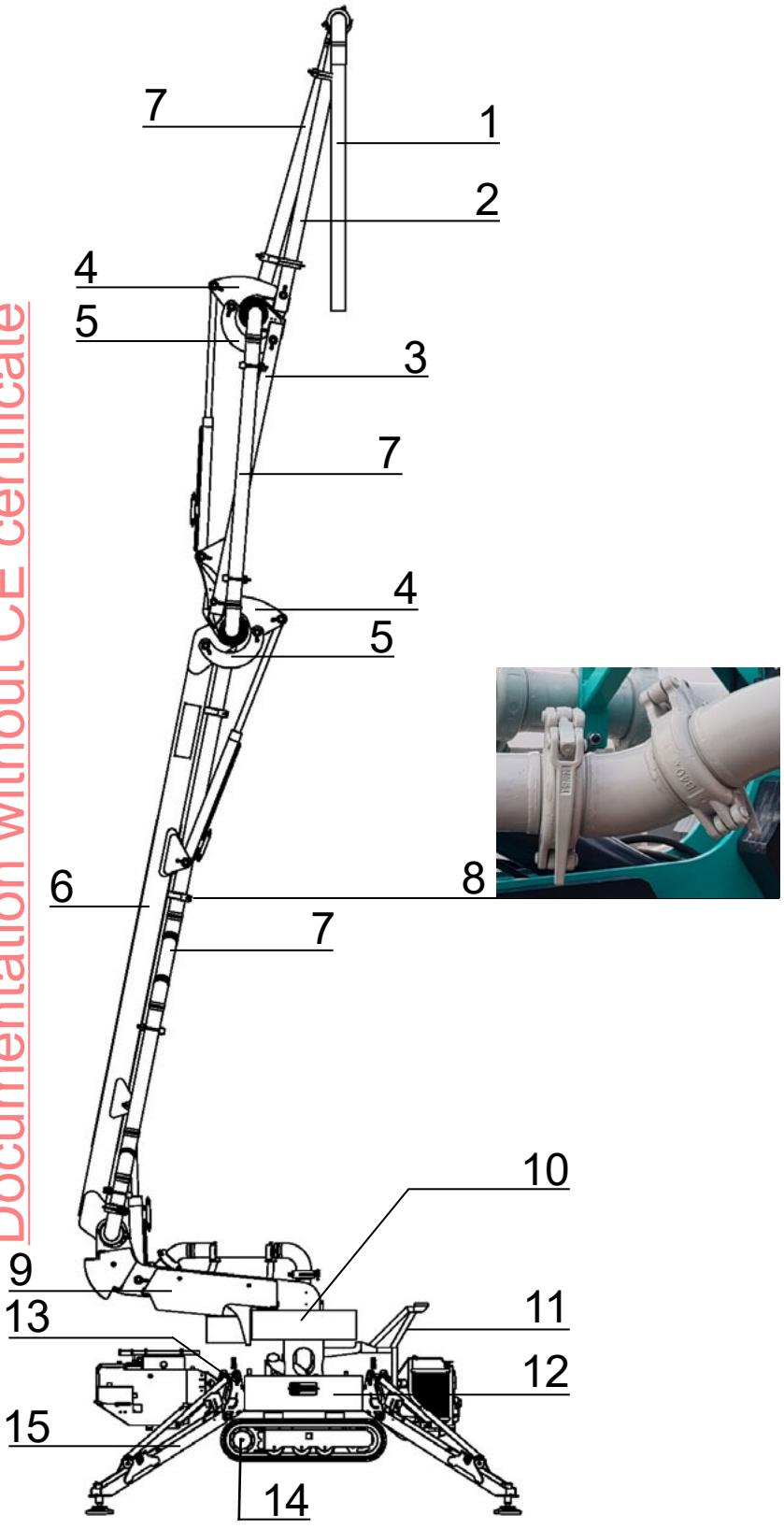
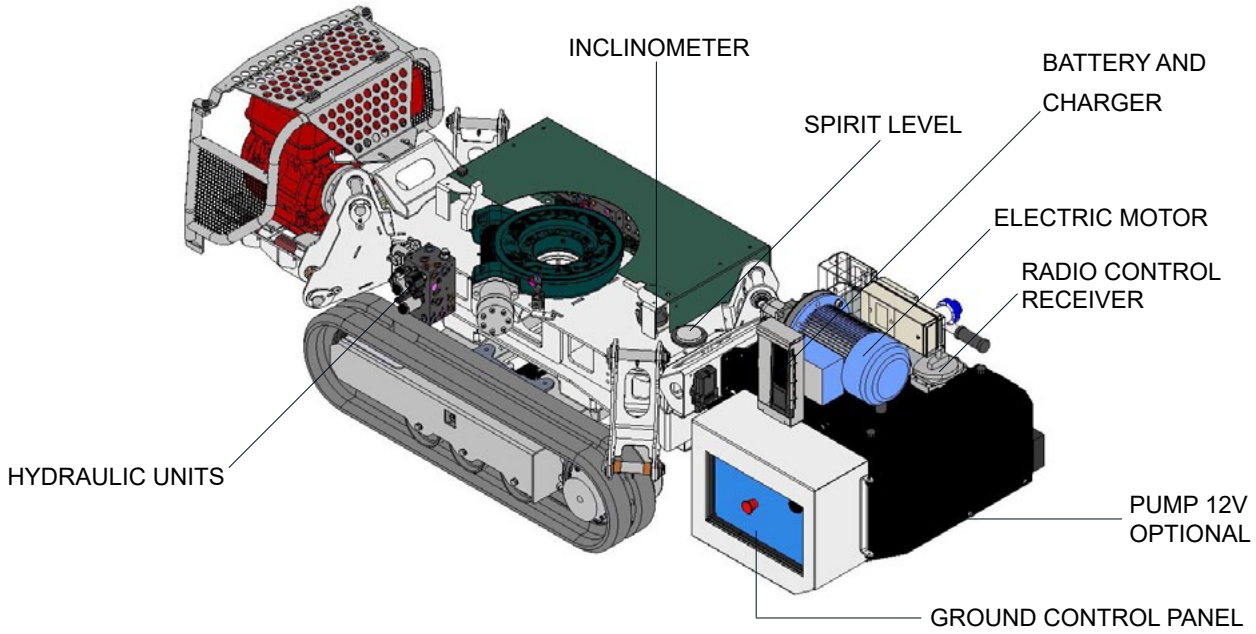


LEFT SIDE

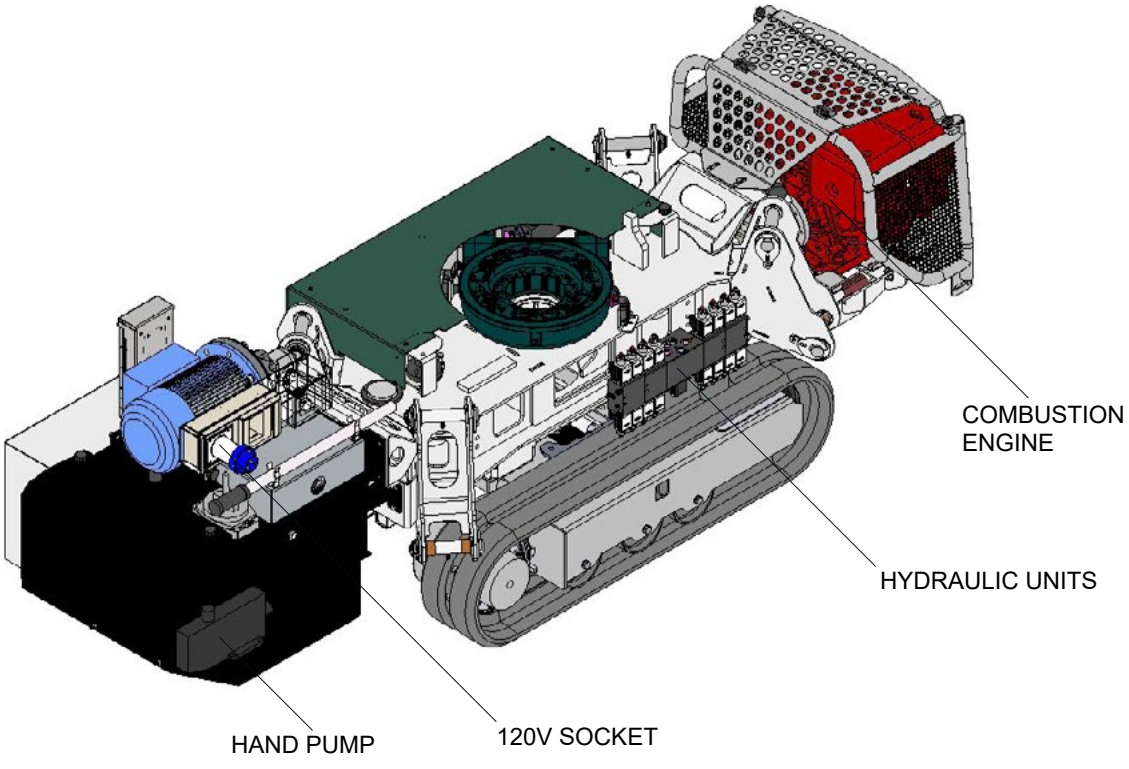
1. Rubber end hose
2. Third boom
3. Second boom
4. Spreader beams
5. Connecting rods
6. Main boom
7. Piping
8. Lever couplings
9. Turret and ballasts
10. Column
11. Distribution boom stowed away
12. Left box
13. Base carriage
14. Drive wheels
15. Stabilisers

Control and power devices

Right side



Left side



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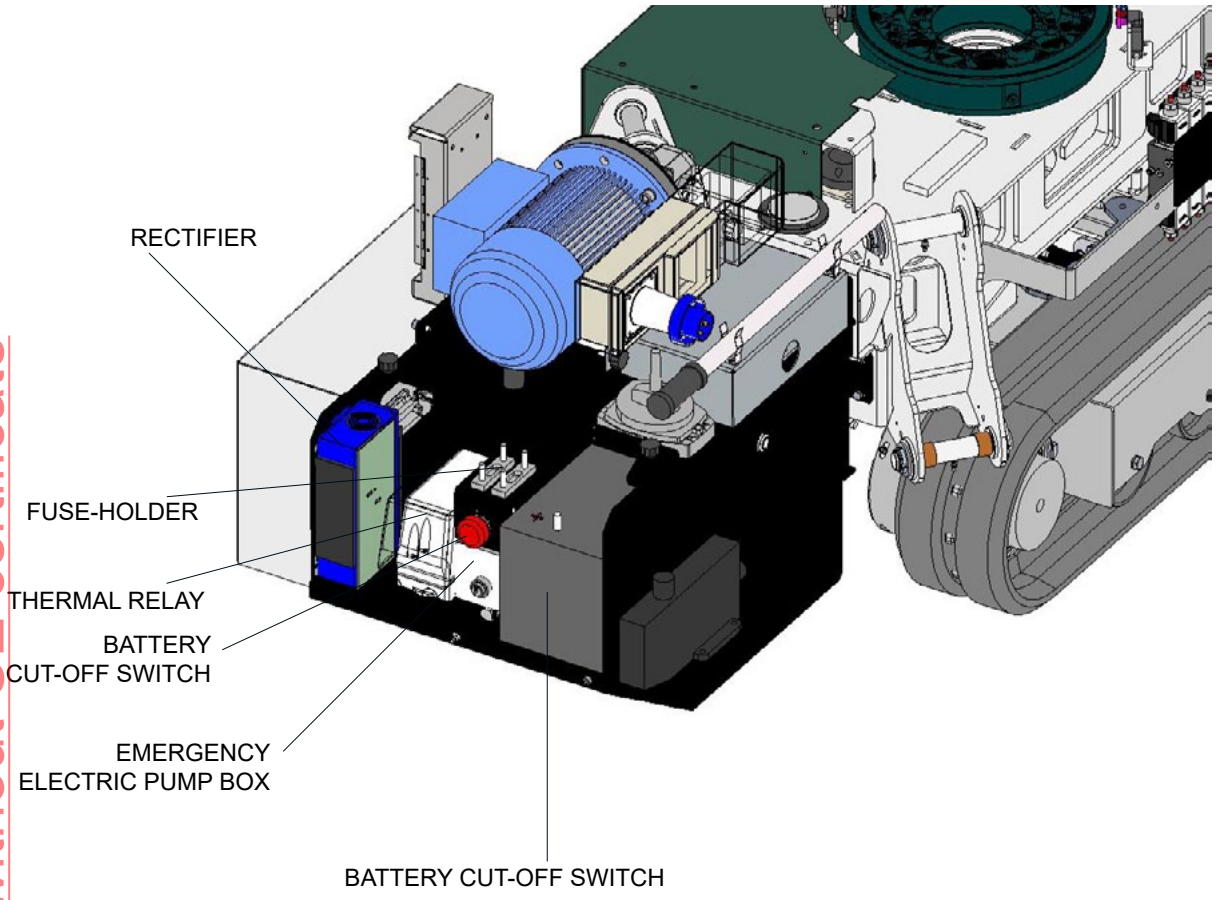
Tank side



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Electronic circuit

The electronic equipment includes the following microprocessor electronic devices for operation of the machine.

- Two main control units located behind the ground control panel.
- Receiver for radio control (communicating via the CAN Bus transmission protocol with the two main boards).
- Push-button panel with display (in communication with the receiver by wire or radio).

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Electrical circuit

The supply voltage must comply with the data plate of the electric motor. At full load, it must be between 205 V and 240 V.

To power the machine it is necessary to use a 2-pole + ground cable in order to ensure connection of the machine to the equipotential site system.

Power cord sizing

The power supply line must be adequately sized to avoid voltage drops. Avoid using winders. The sizing of the electrical supply cable conductors must take into account the operating currents and the length of the line to avoid excessive voltage drops

Cable section (mm^2)			
1.5	2.5	4.0	Cable length (m)
0 - 8	9 - 13	14 - 22	

The power cables used at the site must have a suitable external coating resistant to crushing, wear and weathering.

For the conformity of the power supply system, comply with the standard CEI-64-8 (CENELEC HD384 harmonisation document).

Proportionality of controls

The traction and all movements of the lifting system are proportional: based on the movements of the manipulators on the push-button panel, an electronic system provides a greater or lesser level of energy to the electro-hydraulic distributors that regulate the flow rate of oil to the hydraulic actuators.

Radio control

The radio control is a digital remote control system, based on microprocessor technology, protected against electromagnetic disturbances and radio disturbances.

The radio control consists of:

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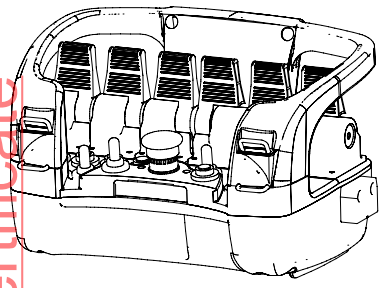
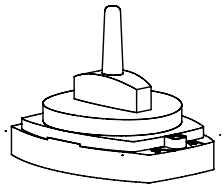
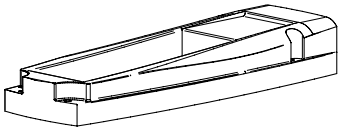


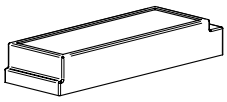
- a **PORTABLE CONTROL UNIT (PUSH-BUTTON PANEL)** with manipulators for proportional control of movements (switches and buttons for ON/OFF functions, warning lights, graphic LCD);



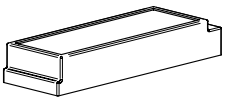
- a **RECEIVER UNIT;**



- a **BATTERY CHARGER;**



- two **batteries** for the push-button panel;



- a **SERIAL CABLE.**

The push-button panel and receiver are combined so that a radio control operates only the machine for which it is designed.

Where it is not possible to use the radio control (for example in airports) it is possible to connect to the push-button panel:

- on the ground via the serial control cable connected to the receiver (the cable is contained inside the document box).

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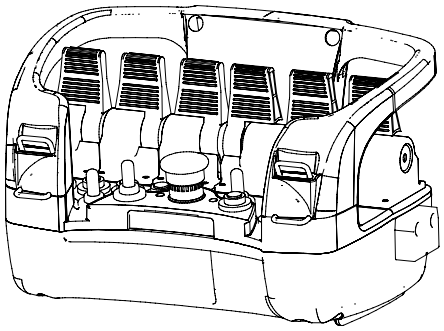
Push-button panel



The portable controller is sturdy, weatherproof, lightweight and compact.

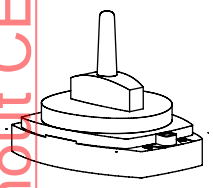
The operating levers and joysticks are proportional with spring return to the centre. The push-button panel is equipped with a mushroom button with an emergency stop function to stop all movements immediately.

The manipulators are surrounded by a protective frame against accidental activation and mechanical damage.

An LED and an acoustic signal are used to indicate regular operation, battery charge status and as a diagnostic tool for detecting any malfunctions.

For versions with radio control, the push-button panel uses a battery inserted at the bottom (see “Push-button panel battery”).

Receiver



The electronic control unit is contained in a sturdy plastic box and comes with connectors to which to connect the push-button panel.

The status and alarm indications are signalled through a 7-segment display located on the receiver.

In the event of a malfunction, the display will display "Er” followed by four characters divided into two blocks corresponding to the error code found.

If the problem encountered is considered “temporary”, the error code will be repeated 3 times and then the radio control will return to standby, as though just turned on.

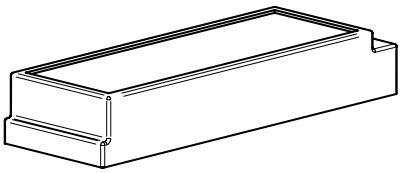
Otherwise, if the malfunction is considered “blocking”, the display will show the error code continuously until the radio control is switched off.

The error code can occur after the receiver is started or after the push-button panel is started (enabling of operating mode).

Push-button panel battery for radio control

The battery inserted at the bottom of the push-button panel allows use via radio. Another battery is supplied to always charge the battery charger.

Replacement is quick and very easy to perform. The operation of a charged battery is approximately 8 hours.



When the battery is about to run out, the push-button panel emits three beeps as a warning and the red ON LED starts flashing (LED to the left of the emergency mushroom). Under charged battery conditions the red ON LED is lit.

The battery must be used until the red ON LED turns off, after which it must be changed. If the battery capacity is too low, the push-button panel may not turn on.

Battery capacity and operating performance are reduced in extreme cold conditions. The battery recharges automatically when using the push-button panel with the serial cable.

In order to minimise battery consumption, and for safety reasons, the push-button panel automatically turns off after a 30-minute idle period.

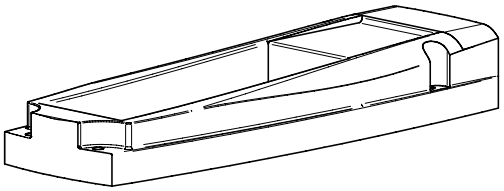
Battery charger

The battery charger is housed in the box on the right side of the electric motor door casing.

It is powered by the 12 V battery to start the engine and is designed not to damage the battery even if subjected to long cycles of continuous charging.

At the top of the charger there are two LED indicators:

- **Red LED** (power supply) - It indicates the presence of the power supply voltage;
- **Green LED** (charging status):
  - **flashing**, the battery is charging (the charger is in fast charging mode);
  - **on steady**, the battery is charged (the charger is in charging mode).



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Recharging the radio control battery

The charger starts a charging cycle when a battery is inserted (the green LED starts flashing). Charging of the radio control battery takes place in two consecutive phases:

- first phase with a high current, to reach the nominal charge level in a short space of time;
- second phase, with a reduced current, to maintain the charge reached until the battery is removed.

The time normally taken to charge a depleted battery is approximately 3 hours (the green LED is on steadily).

If there is no voltage to the device, the charger remembers the last work mode and resumes charging in “fast” or “maintaining” mode when the power is restored.

As a precaution, the charger always stops charging after 3 hours, even if the battery has not reached full charge. After charging, the green LED will always remain on.

Battery charging with serial cable

If the operator is using the push-button panel with the serial cable connected, the battery in the battery compartment will be automatically recharged.

If necessary, the push-button panel can be used as an alternative tool for charging batteries even when the system is not being used.

Insert the battery into the appropriate housing (emergency push-button panel button pressed) and connect the serial cable between the push-button panel and the receiver. The charging time is approximately 12-14 hours.

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Technical data

Description	Unit of measurement	GERRIS 800
Max height	m / ft	11,2 / 36,7
Maximum reach	m / ft	7,8 / 25,6
Depth of casting	m / ft	5,0 / 16,4
Overall dimensions stabilized machine	m / ft	2,92 - 3,08 / 9,58 - 10,1
Traction speed	kmh / mph	0 - 2,5 / 0 - 1,55
Safety speed (enabling with machine open)	kmh / mph	0 - 0,4 / 0 - 0,24
Passable slope	°	18
Maximum permitted lateral inclination of the carriage	°	1
Turret rotation	°	355
Combustion engine	kW / rpm	8,2 / 3600
Electric pump	V / kW	230 / 2,2
Battery	V / Ah	12 / 110 C20
Battery charger	V / A	12 /12
Maximum stabiliser load	daN / lbf	1930 / 4338
Machine weight	kg / lb	2500 / 5512
Oil tank	l / gal	30 / 8
Measured sound power level	dB	102
Guaranteed sound power level	dB	104
Transport width (without pipe support - with support)	m / ft	0,8 - 1,04 / 2,62 - 3,41
Transport length	m / ft	4,9 / 13,41
Transport height	m / ft	2,0 / 6,56
Maximum hydraulic pressure	bar / psi	230 / 3336
Operating temperatures	°C / °F	-20 ÷ +40 / -4 ÷ 104

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Ground pressures

Track pressure = 0,90 kg/cm^2

Stabiliser plate pressure = 4,34 kg/cm^2 (standard plate diameter 20 cm)

Stabiliser plate pressure = 1,42 kg/cm^2 (optional plate diameter 35 cm)

Dimensions and spaces

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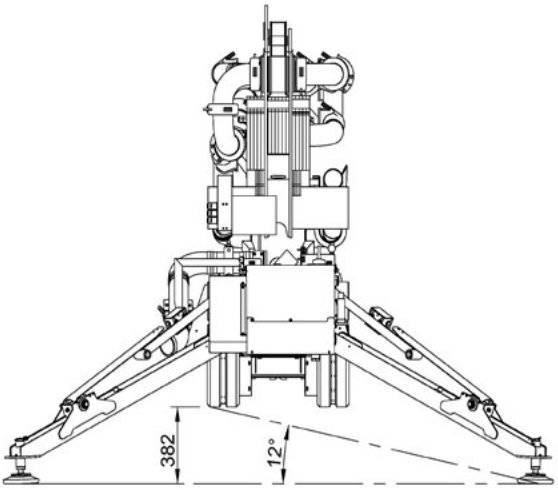

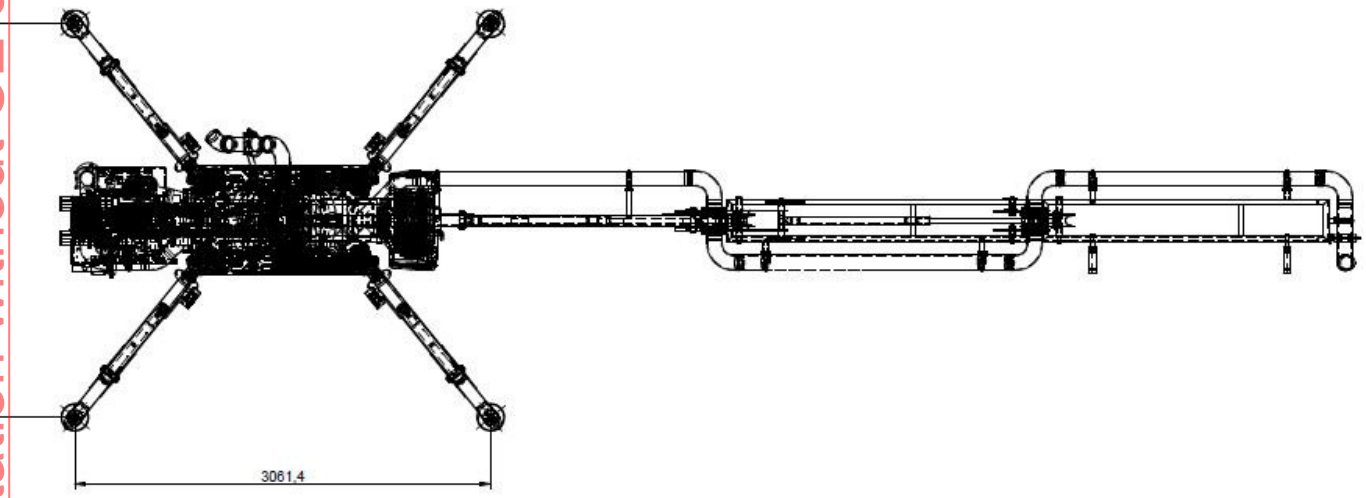

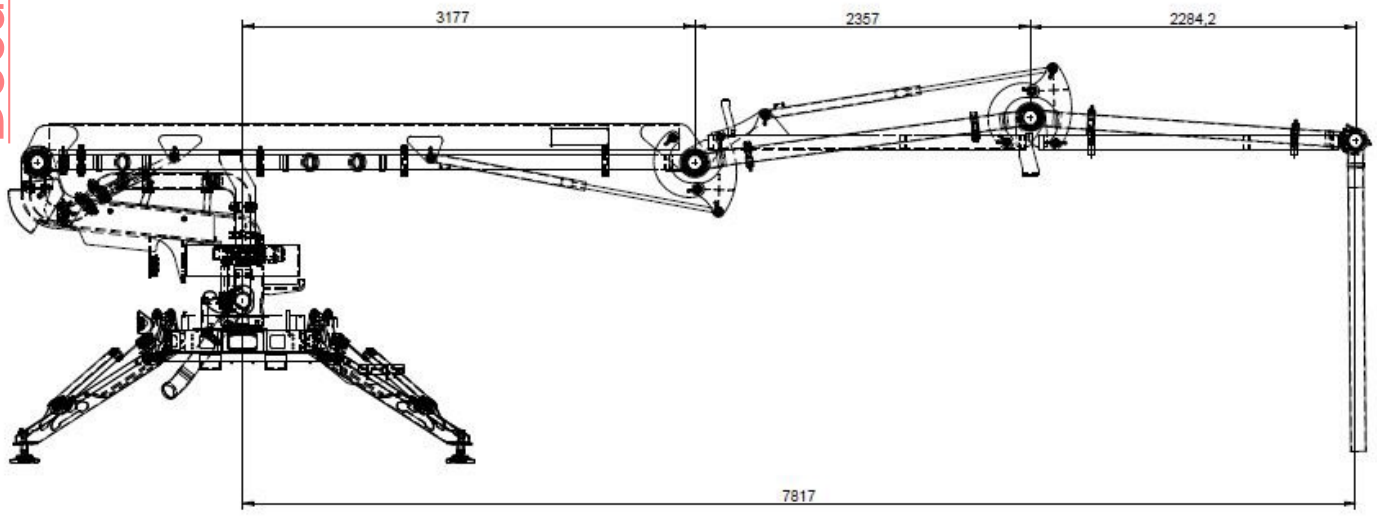

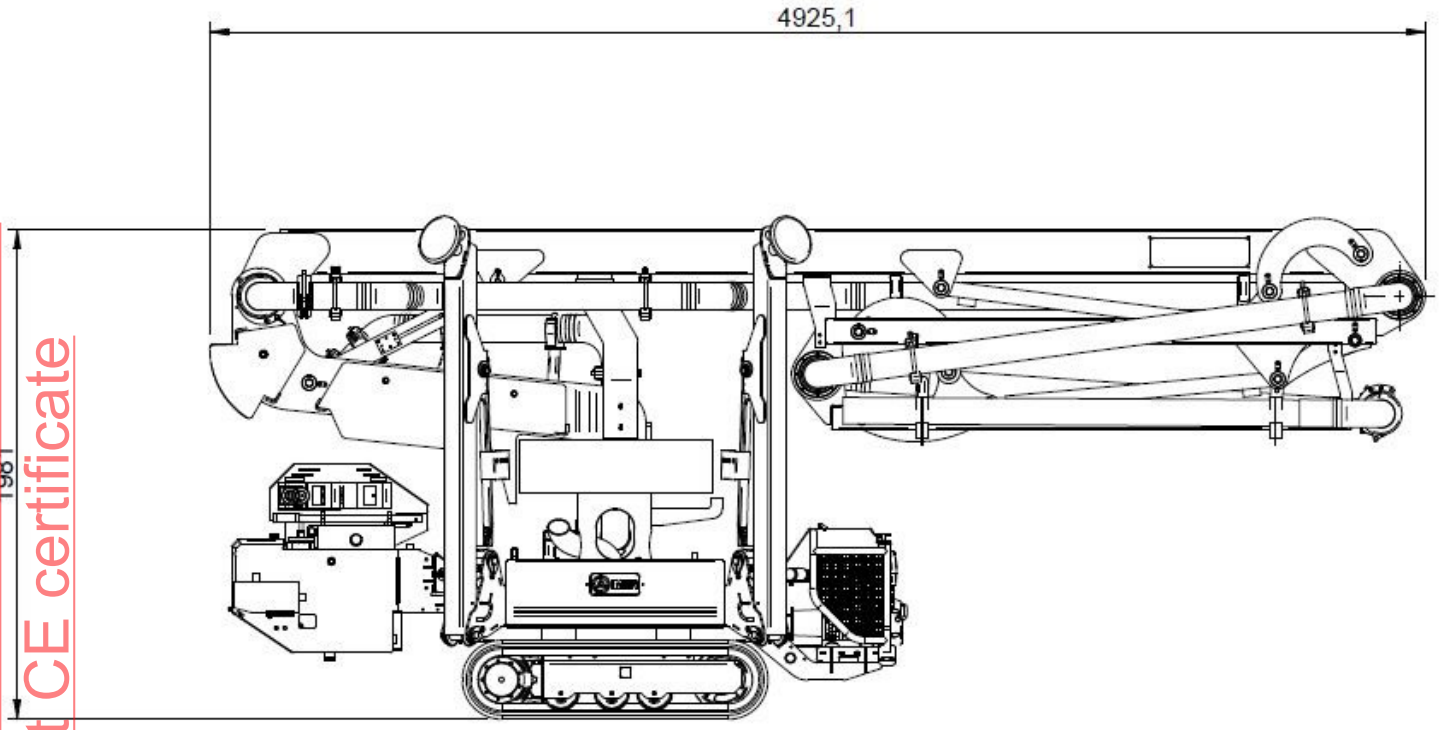

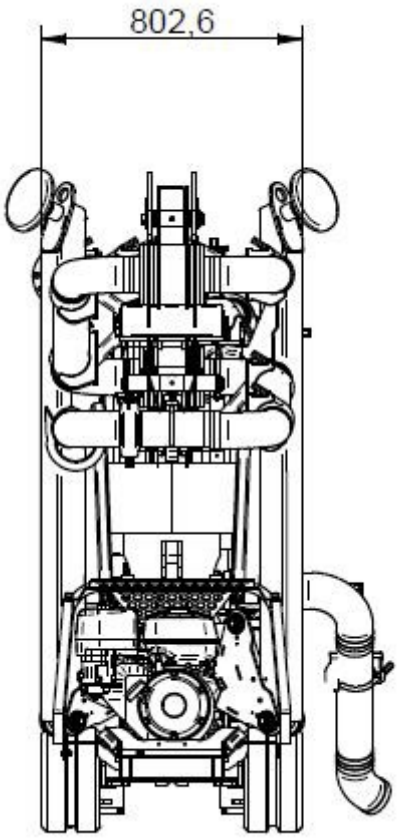

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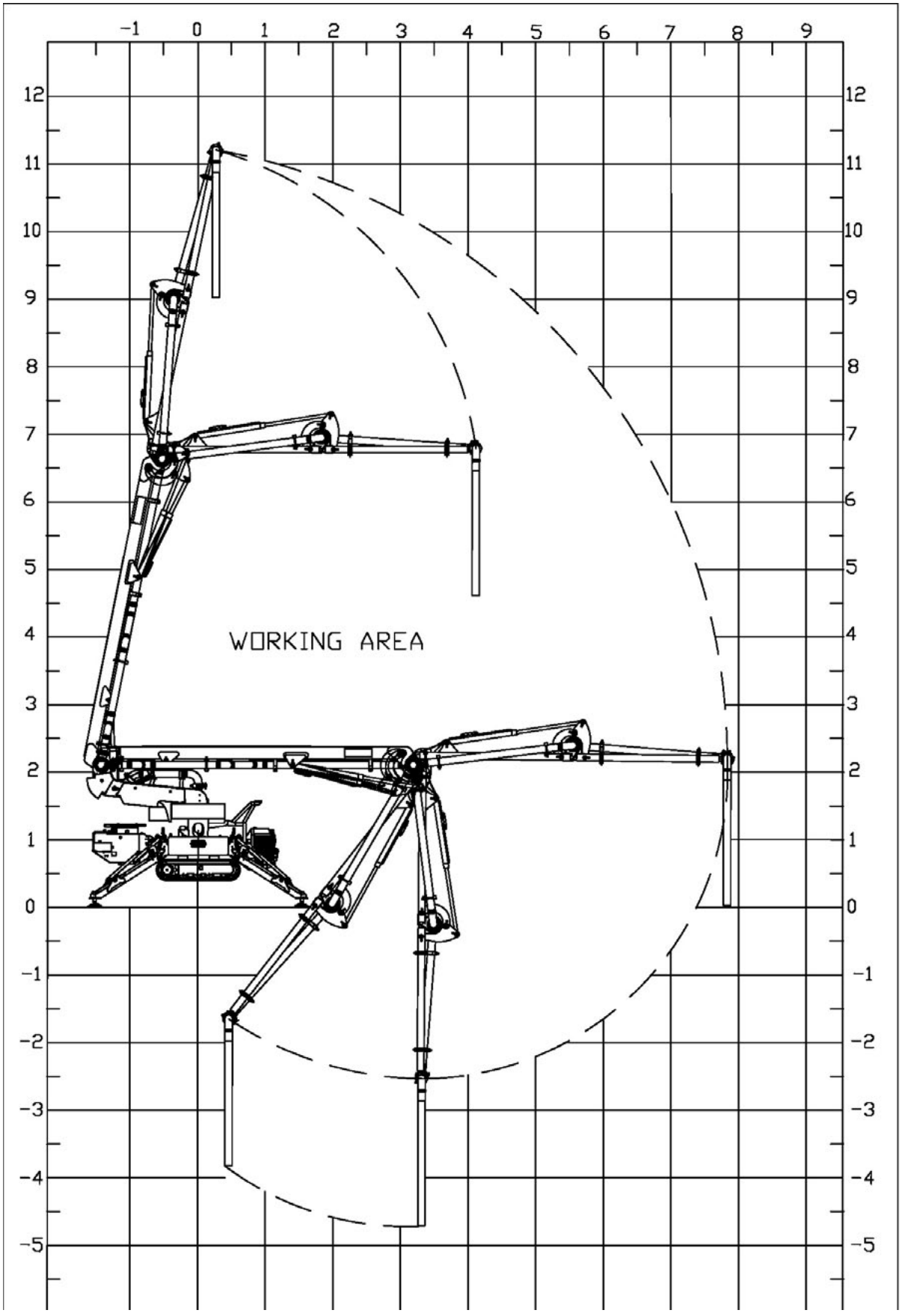
Work diagram



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Plates and stickers

Check with the figures for the presence of all plates and stickers.

Stickers or plates that do not contain text have alphanumeric codes ending in XX, or 8-digit numeric codes.

Stickers or plates containing text have an alphanumeric code ending with the initials of the country of destination of the machine.

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3237323	MADE IN ITALY	1
82021098	YELLOW/BLACK BANDS (H70)	12
A00358XX	BATTERY CHARGER SOCKET	1
A00145XX	DOCUMENT BOX	1
A00411USA	MAX STABILIS. LOAD	4
A00448USA	CRUSHING HAZARD	4
A00174XX	OIL TYPE ISO VG 46	1
A00190XX	LIFTING HOOKS	4
A00405USA	DISTANCE BETWEEN POWER LINES	1
A00322XX	WHITE LOGO	4
A00447USA	HAND CRUSHING HAZARD	7
A00357XX	TURRET ALIGNMENT	2
A00361XX	HYDRAULIC BLOCK LETTERS	1
A00362XX	SERIAL CABLE	1
A00363XX	TRANSPORT ROPE	4
A00364XX	MAGNETOTHERMIC	1
A00380XX	DIRECTION ARROW	2
A00517XX	GERRIS 800 (LARGE)	2
A00518XX	GERRIS 800 (SMALL)	2
A00508XX	HANDLING BLOCK B	1
A00509XX	MAIN BLOCK A	1
A00536XX	HANDLING BLOCK C	1

A00289XX	SOUND POWER (P VERSION)	1

A00033GB	EMERGENCY	1
A00458USA	EMERGENCY PUMP	1
A00103USA	PROHIBITION OF ACCESS	6
A00383USA	REMOVE THE KEY	1
A00537GB	REGISTRATION PLATE	1

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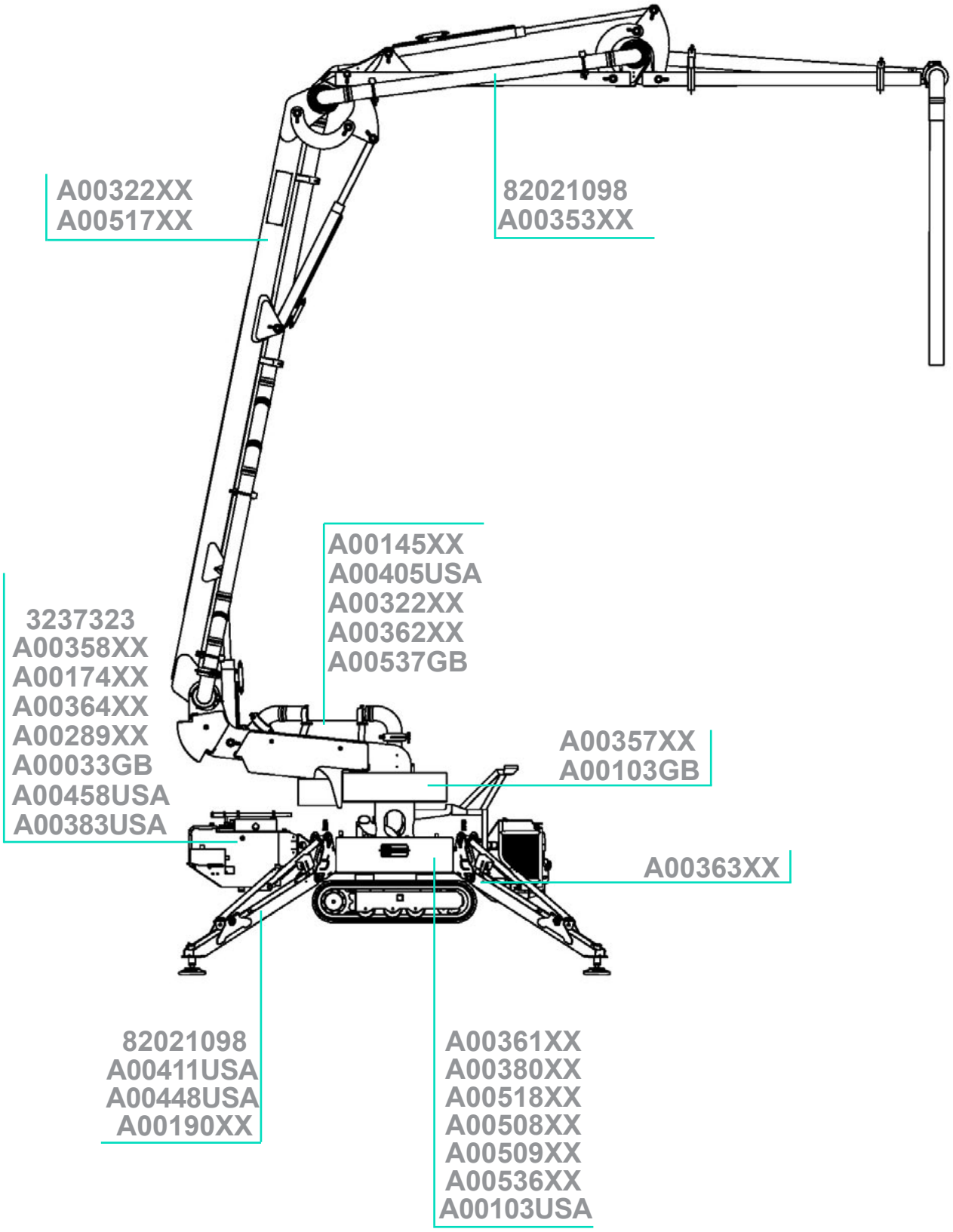

Identification

An engraved metal plate affixed to the turret bear all the information needed to identify the machine.

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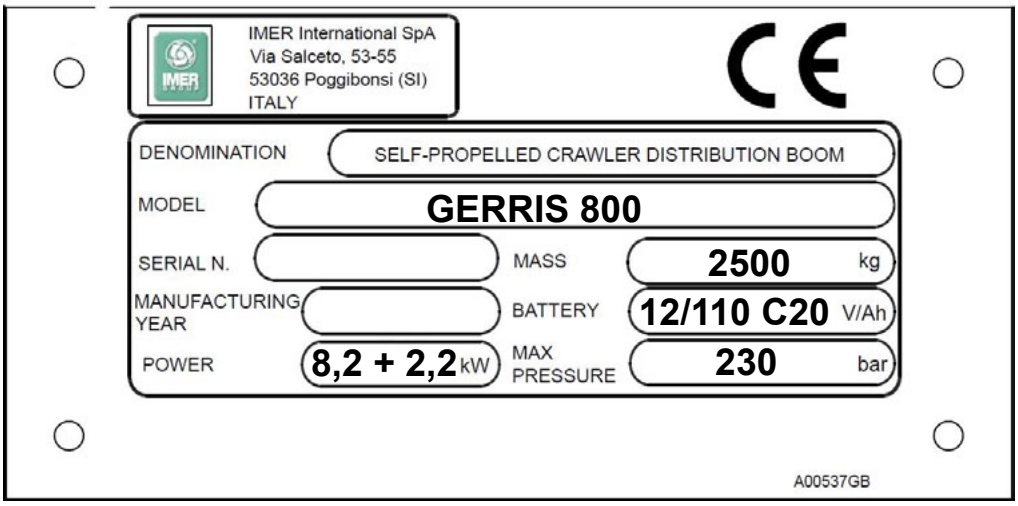

The data refers to the standard version

Standard set-up

- Proportional and simultaneous movements
- 4 “ piping kit
- Wireless radio control
- 230 V - 16 A electric pump for use from the mains
- Dual-speed engines
- Negative parking brakes
- Rubber tracks
- Hydraulically extendible tracks
- 355° turret rotation
- Automatic stabilisation
- Locking valves on cylinders
- Manual emergency descent
- Double controls from the ground and from the push-button panel
- Hour counter
- Motion audible warning device
- Battery disconnect plug
- Socket, plug and life saver for 120 V line
- Traction enabling kit with open machine

Optional

- No marking tracks kit
- 12 V emergency electric pump
- Imerview kit
- Special plates kit (d.350)
- 2 “ piping kit

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Machine movements

Ground movements - Aerial movements

The movements refer to two parts of the machine: the ground part and the aerial part.

The ground part consists of the carriage (with tracks and stabilisers).

The ground movements are:

- machine traction and steering;
- opening and closing of the tracks;
- stabilisation.

The aerial part consists of the lifting system.

The movements of the aerial part are:

- lifting / lowering of the main boom;
- turret rotation;
- opening / closing of the second boom;
- opening / closing of the third boom.

Depending on the positions that the machine can have (see MACHINE STATUS), ground and/or aerial movements can be performed.

Aerial moves are not allowed if traction with open machine is enabled.

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Ground movements

Traction and steering

To perform traction the base carriage is fitted with two hydraulic motors that move rubber tracks. Steering is achieved by moving the tracks at different speeds.

Track widening

Widening of the tracks makes it possible to obtain greater stability when moving on site or in areas that are difficult to access.

The movement is driven by a hydraulic cylinder located inside the carriage.

Stabilisation

Stabilisation takes place via 4 hydraulic cylinders.

It can be automatic or manual.

Automatic

In addition to the simultaneous lowering of the stabilisers, automatic stabilisation also provides for the levelling of the machine with a tolerance of less than 1° (with an error of ± 0.1°).

Manual

Each stabiliser is lowered or raised individually.

Failure to level is a non-optimal condition; however, the machine's electronic system does not block any movements, since the conditions are in any case safe, up to the 2° threshold (in this case, the movements are blocked - see the paragraph ‘Carriage tilt control’). The operator can decide whether to continue using the machine or to stabilise it (bringing it within 1° of inclination).

If the machine is not properly levelled, its stability is compromised, creating risks for the operator and for any persons working near the machine.

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Aerial movements

Lifting / lowering of the main boom

The movement is driven by a hydraulic cylinder located between the turret and the boom.

Turret rotation

The movement is driven by a hydraulic engine that moves a fifth wheel located on the column. The turret rotates by 355°.

Opening / closing of the second boom

The movement is driven by a hydraulic cylinder located between the main boom and the first spreader beam.

Opening / closing of the third boom

The movement is driven by a hydraulic cylinder located between the frame of the second boom and the second spreader beam.

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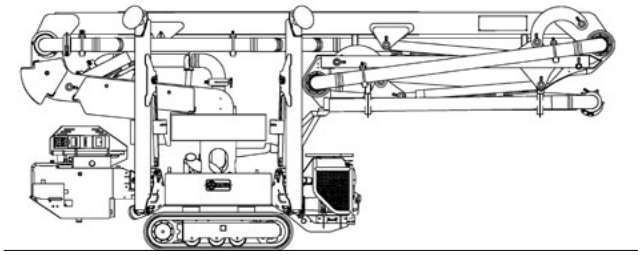
Machine status

Terms are used in this manual to indicate the status or position of the machine, according to which different movements can be performed.

Each machine status is displayed on the push-button panel display.

Machine stowed away

The machine is STOWED AWAY when the distribution boom is resting on the carriage support and none of the stabilisers are resting.



The machine stowed away allows:

- MOVEMENT of the machine by traction and steering;
- STABILISATION of the machine.

The machine stowed away is the only position that allows the stabilisers to move.

The machine stowed away is the position in which the machine must be found at the beginning and end of work.

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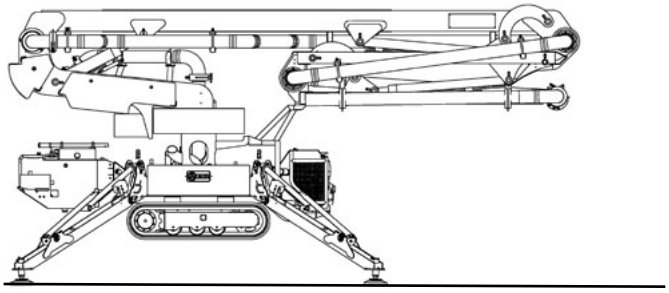
Machine stabilised and stowed away

The machine is STABILISED AND STOWED AWAY when all 4 stabilisers are resting, the turret is aligned and the distribution boom is resting on the carriage support.

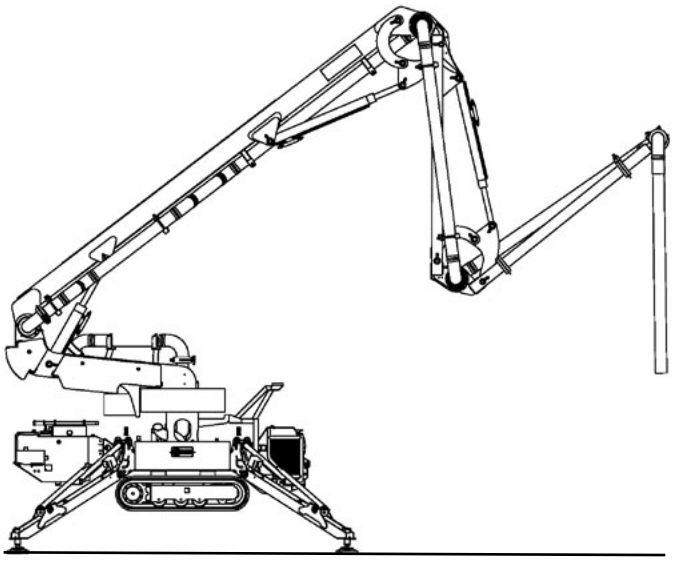


The MACHINE STABILISED AND STOWED AWAY status is used to:

- start opening the lifting system by lifting the main boom at the start of work;
- return to the machine STOWED AWAY status by lifting the stabilisers at the end of work.

Machine open

The machine is considered OPEN when the aerial part is activated from the STABILISED AND STOWED AWAY status.



From the MACHINE OPEN position, all the movements of the aerial part can be carried out except those concerning the second and third booms (for the latter, the main boom must have been raised by 10° with respect to the fifth wheel plane first).

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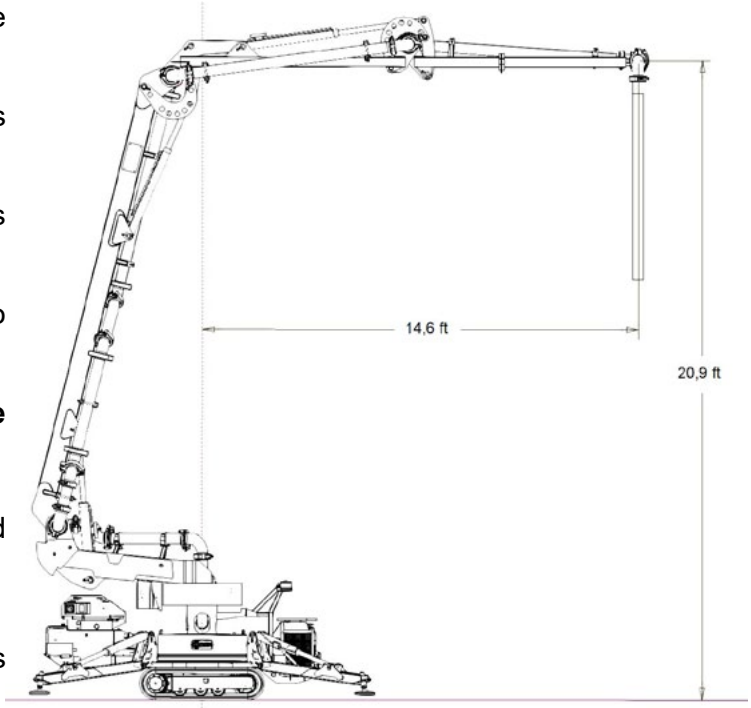
Enabling traction with open machine

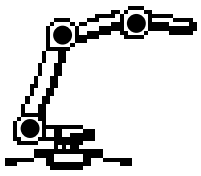
The **traction enabling kit** allows the translation of the open machine in compliance with the following constraints at the same time:

- **main lifting arm open** according to the dimensions in the figure;
- **second arm open** according to the dimensions in the figure;
- **third arm open** according to the dimensions in the figure;
- **turret rotated** maximum ±90° with respect to the axis of the hospitalized arm;
- **base wagon inclined max ±3° (otherwise the icon is displayed**).



The correct opening of the three arms is indicated by the filling of the dots in the icon .

Once all items are placed, the follow icon is displayed:



From this position the machine allows the raising of the stabilizers. The stabilizers are distanced from the ground for a sufficient distance to allow traction in safety (icon **OK**). **Aerial movements are blocked**. In case of contact of one or more stabilizers with the ground, traction will be interrupted.

In traction mode with the machine open it **is allowed**:

- move the machine at a safe speed in all directions;
- stabilize the machine, returning to the open machine state.

Traction mode with open machine **is not permitted** in case of:

- opening of one of the three arms at angles other than those allowed;
- turret rotation beyond ±90°;
- undercarriage inclination over ±3°;
- contact of one or more stabilizers with the ground.

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Safety systems

Safety devices are provided on the machine that block normal operation to prevent damage to property or persons.

Knowledge of the characteristics and operation of the safety devices are essential; it is therefore advisable not to operate the machine without first reading and assimilating the following section.

As, depending on the positions that the machine can assume, the safety devices are activated or not, it is important to be familiar with the CONFIGURATION and the meaning of the MACHINE STATUS illustrated in the previous pages.

Failure to operate a safety device, caused by a fault or by tampering, can cause serious damage to the machine and consequently endanger the life of the operator.

Periodically check the safety devices as described in the manual.

The safety devices must never be tampered with. The manufacturer declines all responsibility for accidents attributable to interventions and tampering with the same.

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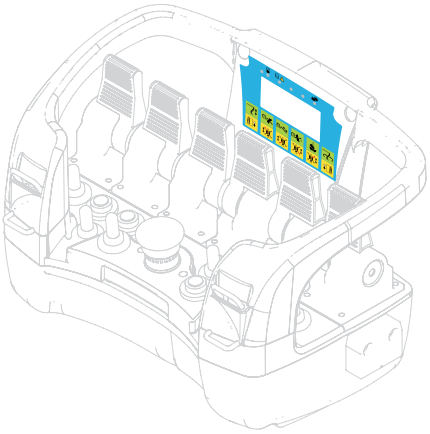
Anomalies

In the event of a malfunction detected by the self-diagnosis of the main machine control units, an error code will be displayed on the push-button panel display.



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Audible signals

Abnormal condition: it is signalled by an intermittent high-frequency sound. All or part of the machine movements are blocked until the machine is returned to safe operating conditions.

Normal operation: any movement of the machine is signalled by an intermittent low frequency sound.

Thermal relay

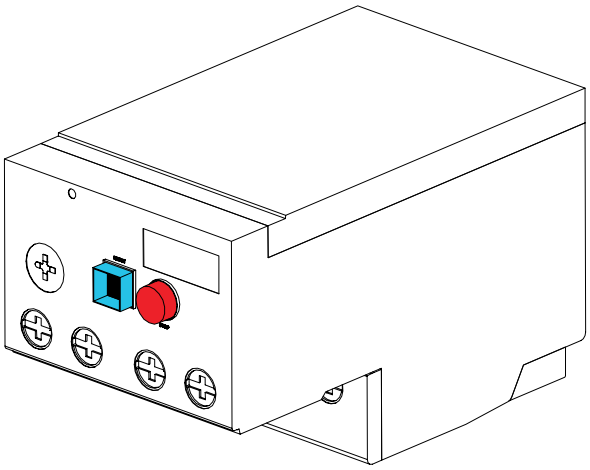
The thermal relay protects the electric motor from any current overloads.

It is positioned in the tank housing, inside the protective box.

In the presence of an overload, the thermal relay interrupts the supply circuit to the motor.

After checking and eliminating the cause of overload, to reset the motor press the blue relay reset key.

The red key is used to perform the relay test (see “Electric motor maintenance”).



Sensor oil filter clogged

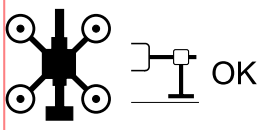
It consists of a sensor on the oil filter of the hydraulic circuit.
If the filter is blocked, all movements are slowed to 40% of the maximum permitted.

Tilt sensor and spirit level

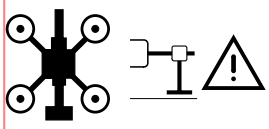
Remember that the maximum inclination of the carriage is 1 degree.

There are two devices used to control the inclination of the machine: **the tilt sensor** and **the spirit level**.

The tilt sensor is integrated into the self-levelling system, it is an angle sensor that, located at the front of the carriage, detects its angle. The following icons appear on the display:

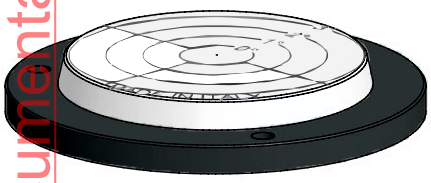


- the carriage is levelled with respect to zero with an error of ± 0.1°;



- the carriage is inclined by more than 1°.

Automatic levelling is an electronic aid that greatly increases ease of use of the machine. It is however necessary to ALWAYS check during and after the levelling phase correct inclination of the machine by means of the spirit level.



The spirit level is positioned at the front of the carriage.

During the levelling phase of the machine, use the spirit level to check that the permissible inclination limit of 1° is respected.

Always check the correct inclination of the machine after each levelling operation.

If the machine is not properly levelled, its stability is compromised, creating risks for the operator and for any persons working near the machine.

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Microswitches

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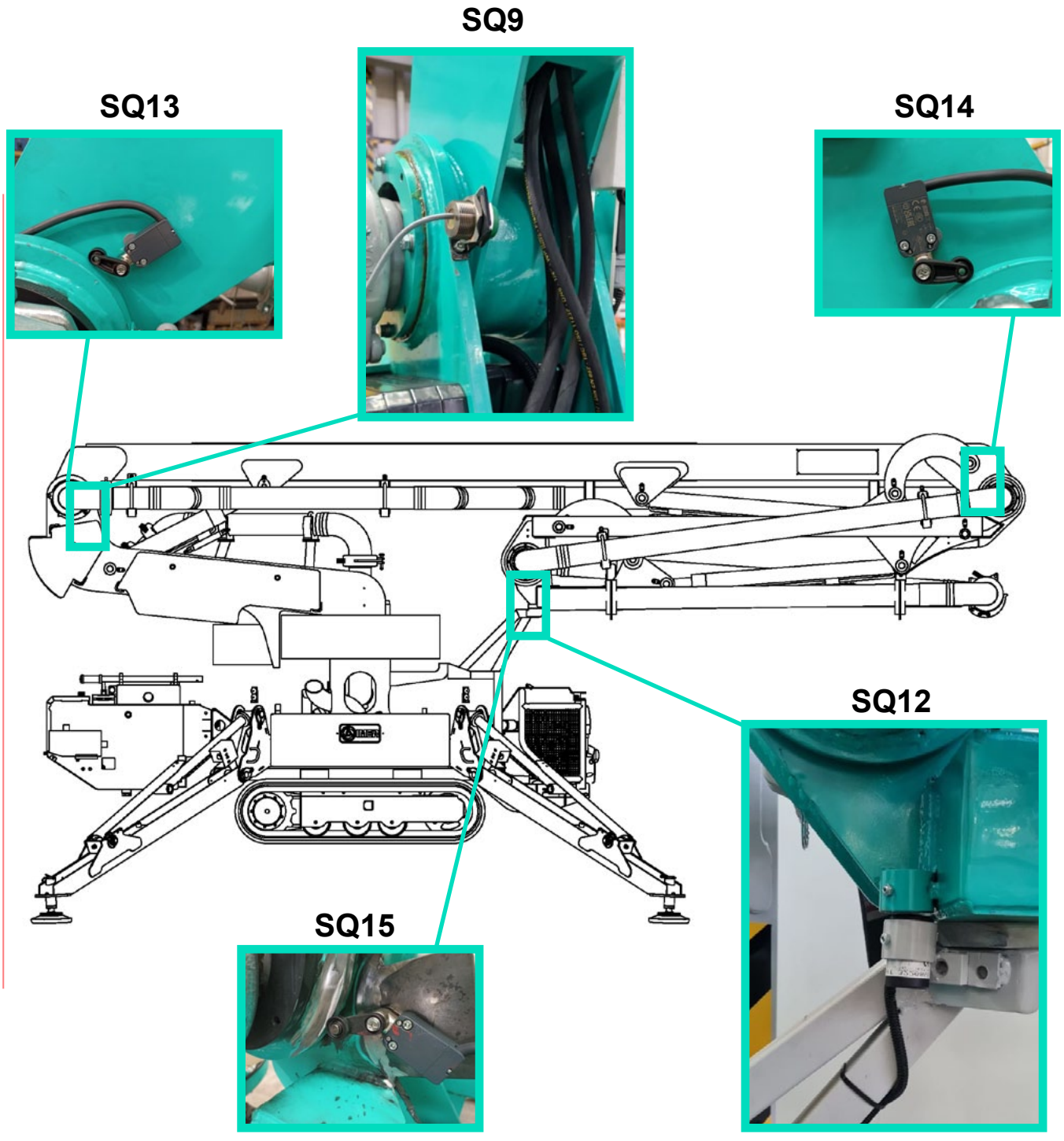


Microswitch SQ12 (stowed away)

SQ12 is a magnet located at the base of the boom support on the carriage: the approach of the distribution boom verifies its correct closure.

With the MACHINE STOWED AWAY (distribution boom in place) ***it is possible to:***

- perform traction movements at all speeds;
- lower and/or lift the stabilisers.

With the MACHINE STABILISED AND STOWED AWAY ***it is possible to:***

- lift the main boom.

After this, the turret can be rotated.

Microswitch SQ9 (activation of second and third booms)

SQ9 is a magnet located on the hinge between the main boom and the turret and it detects the threshold of the inclination required for the activation of the second and third booms.

With the MAIN BOOM tilted LESS than 10° with respect to the fifth wheel plane ***it is possible to:***

- perform the aerial movements of the main boom and of the turret.

It is NOT possible to:

- perform the aerial movements of the second and third booms.

With the MAIN BOOM tilted MORE than 10° with respect to the fifth wheel plane ***it is possible to:***

- perform all aerial movements.

Microswitches SQ13-14-15

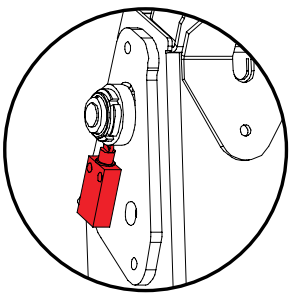
SQ13 SQ14 SQ15 are placed near the articulations of the lifting arms.

They control the positioning of the arms in order to enable traction with the machine open.

- When all three microswitches are in the correct position (indicated on the display) it is possible to enable traction with the machine open.
- If one of the three arms goes out of the allowed angles, traction is disabled.

Microswitches SQ3-4-5-6

SQ3 SQ4 SQ5 SQ6 are located near the rod fixing pin of the stabiliser cylinders.



Check the pressure setting of the stabilisers.

- When even one single stabiliser is resting on the ground, traction is blocked.
- If all 4 stabilisers are resting on the ground, it is possible to move the aerial part.
- If TRACTION WITH THE MACHINE OPEN is enabled, the contact of one or more stabilizers with the ground blocks the traction.

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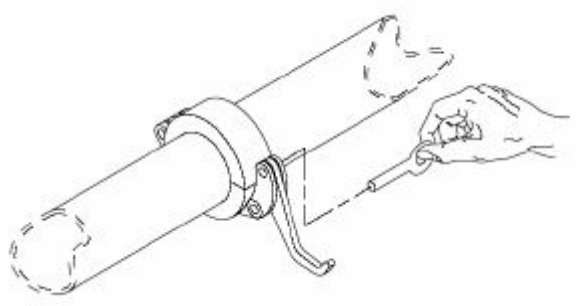
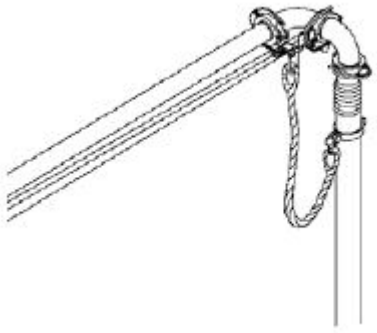
Lever coupling safety pins

The lever couplings of the concrete pipes are closed and locked using the appropriate pin.



Rubber end hose anchoring safety cable

The rubber end hose is anchored to the last element of the boom by means of the special safety cable.



Turret encoder

An encoder is an electronic device connected to the main control unit via CANbus. It allows the accurate position of the turret to be detected by means of the rotation angle.

This device makes it possible to:

- detect the centring position for correct stowing;
- confirm the position of the turret to enable traction with the machine open.

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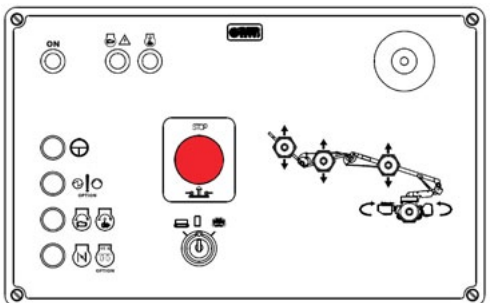
Emergency devices

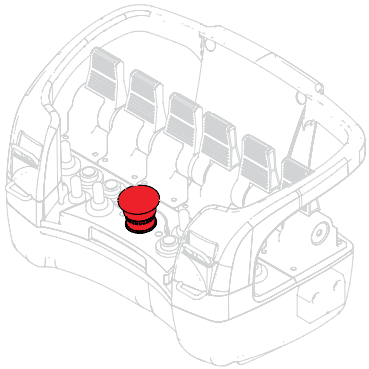
Emergency devices are provided on the machine.

Knowledge of the characteristics and operation of the emergencies is essential; it is therefore advisable not to operate the machine without first reading and assimilating the following section.

Emergency stop

The emergency mushroom button is located on the ground control panel and on the push-button panel.

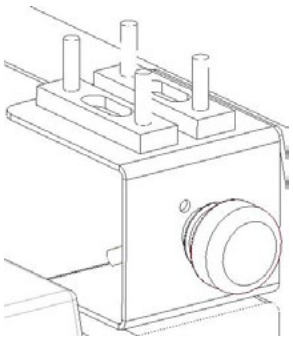




Pressing one or both buttons blocks all movements, allowing any machine function to stop immediately in emergency situations.

To restore normal functions, turn the button clockwise.

Battery cut-off switch



The battery cut-off switch is located in the front box (tank area).

This safety device interrupts the power and control circuits from the batteries, blocking all movements.

It must be operated in case of prolonged shutdown of the machine or for maintenance work on the electrical equipment.

Solenoid valves for emergency movements

The hydraulic blocks on the machine are equipped with solenoid valves used for emergency movements.

Reference should be made to the paragraph “Manual emergency procedures”.

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Hand pump

The hand pump is positioned on the left side of the oil tank, while the lever to operate it is positioned above it.

The hand pump is used to send oil under pressure to perform manoeuvres in emergency situations or failure.

Reference should be made to the paragraph “Manual emergency procedures”.

12 V electric pump (optional)

The electric pump is located under the oil tank.

The electric pump is used to send oil under pressure to perform manoeuvres in emergency situations or failure.

Reference should be made to the paragraph “Manual emergency procedures”.

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Control points

The control points provided for the operator are:

- push-button panel used on the ground;
- ground control panel.

Using the push-button panel excludes the ground control panel and vice-versa.

The ground control panel is mainly used in emergency situations or during maintenance. Traction, steering and stabilisation cannot be performed from the ground control panel.

In versions with radio control, the push-button panel must always be switched on, even if the ground panel controls are being used.

The machine movements are:

- Traction (forward and backward movement)
- Steering
- Track widening
- Stabilisation
- Lifting / lowering of the main boom
- Turret rotation
- Opening / closing of the second boom
- Opening / closing of the third boom

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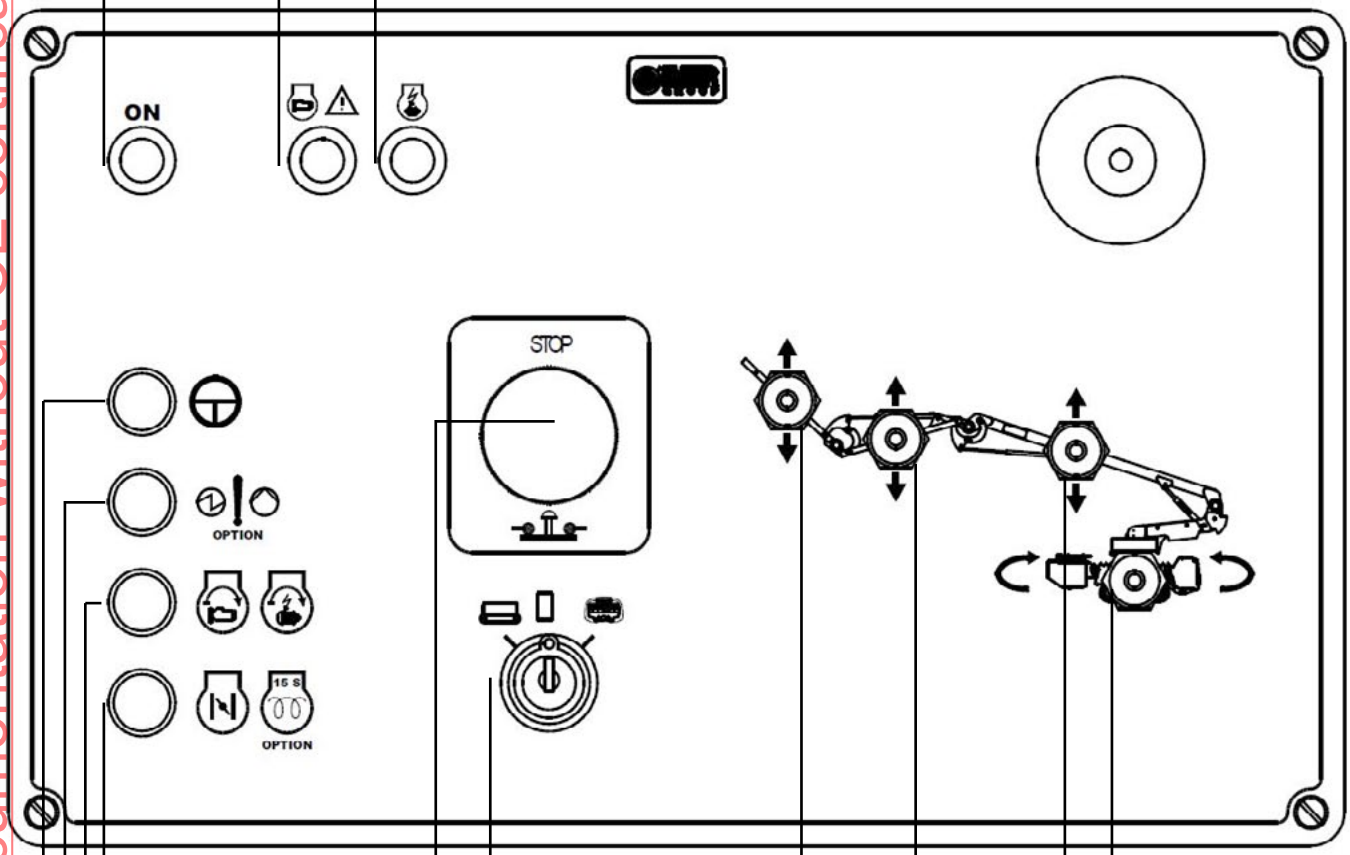
Control panels

Ground control panel



11 Machine luminous light on (green)

12 Red light (A)

13 Green light (B)

6 Air (petrol engine)

5 Start

4 Emergency electric pump (optional)

3 Dead-man

1 Key selector (3 positions)

2 Red emergency stop button

7 **Turret** rotation

8 **Main boom** lifting/lowering

9 **Second boom** opening/closing

10 **Third boom** opening/closing

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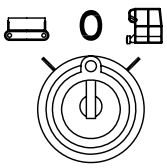
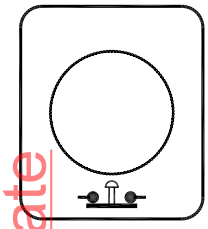


1 - Key switch (3 positions)

- Position in the centre: the machine is off.
- Position on the right: the push-button panel controls are active.
- Position on the left: the controls from the ground panel are active.



2 - Red emergency stop button

- Pressed, it stops all machine functions.
- Released, it allows the machine to operate.

3 - Dead-man

Each movement of the aerial part by means of selectors 7 to 10 is carried out only by holding down button 3 which has the function of dead-man.

4 - Emergency electric pump

Emergency electric pump on (optional).

5 - Start

Combustion engine ignition (petrol). If the machine is connected to the mains voltage, the electric motor starts.

6 - Air (petrol engine)

It makes it easier to start the engine if it is cold.

- Petrol engine: keep pressed simultaneously with button 5 to activate the engine air.

7....10 - Aerial movement selectors

With selectors 7 - 8 - 9 - 10 and button 3 dead-man, the movements of the aerial part are performed.

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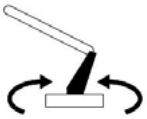
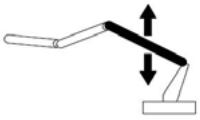


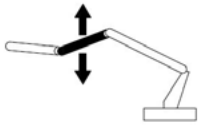
7 - Turret rotation

- Move selector 7 to the right to turn the turret anti-clockwise.
- Move selector 7 to the left to turn the turret clockwise.



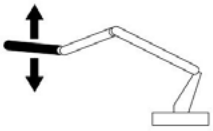
8 - Lifting / lowering of the main boom

- Move selector 8 up to lift the main boom.
- Move selector 8 down to lower the main boom.



9 - Opening / closing of the second boom

- Move selector 9 up to open the second boom.
- Move selector 9 down to close the second boom.



10 - Opening / closing of the third boom

- Move selector 10 up to close the third boom.
- Move selector 10 down to open the third boom.

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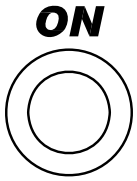
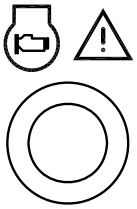


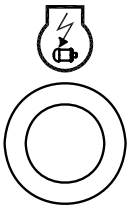
11 - Machine light on

The green light 11 lights up when the selector 1 is not in the central position.



12 - Mains voltage disconnected light

If the red light 12 is on the mains voltage is disconnected. When the combustion engine is switched on, the light goes off.



13 - Mains voltage connected light

If the red light 13 is on, the mains voltage is connected. The electric motor can be used.

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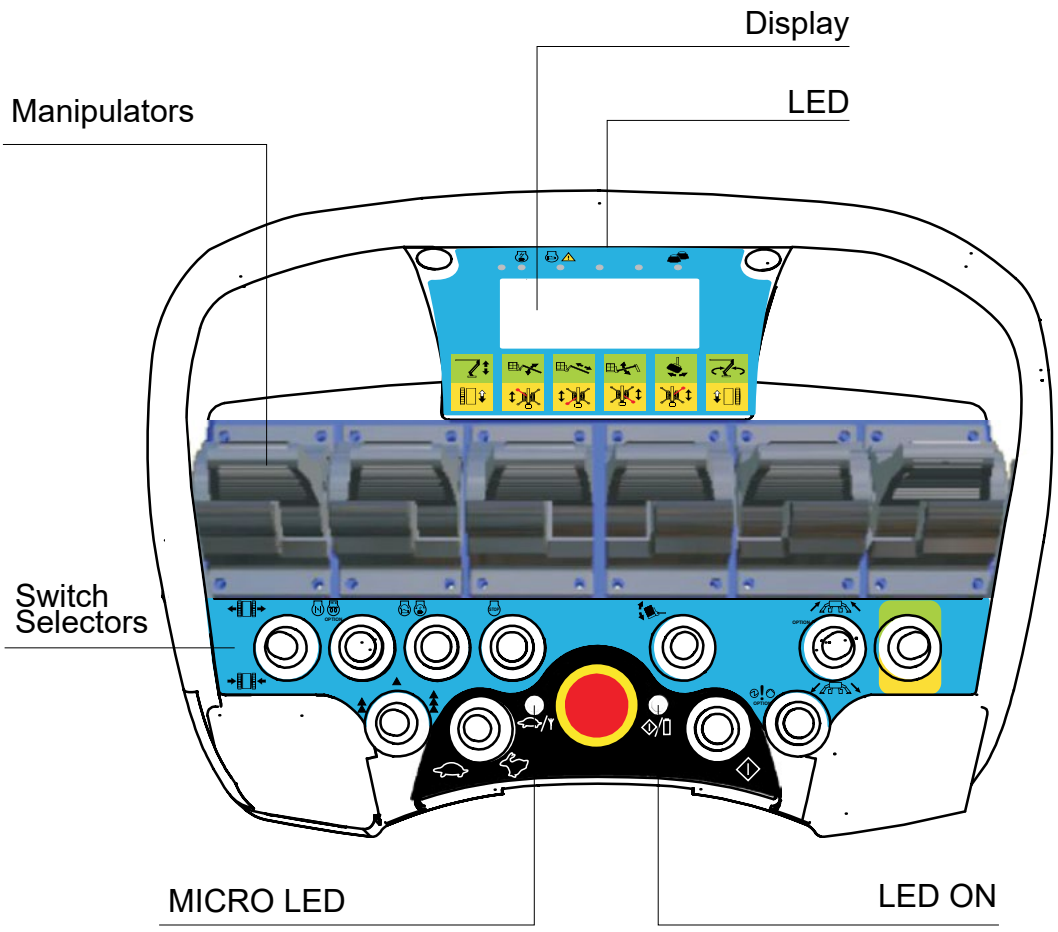
Push-button panel

Turn on the push-button panel with the switch and wait for the red ON LED to turn on.



The ON LEDs and MICRO LEDs indicate the operating status and alarms.

LED ON red on: the push-button panel is active and is transmitting via cable or radio.

LED ON red flashing once every second, radio control version only: the battery is running low. This indication is preceded by three acoustic signals from the internal buzzer.

MICRO LED red on: radio communication lost.

MICRO LED green off indicates that the HARE speed of the combustion engine is active.

MICRO LED green flashing indicates that the TORTOISE speed of the combustion engine is active.

Error code

The push-button panel performs a check on its parts each time it switches on and in case of anomalies it displays an error code, flashing the red LED ON and sounding the internal buzzer a certain number of times, depending on the type of error found. Refer to the push-button panel manual annexed to the machine.

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Selectors

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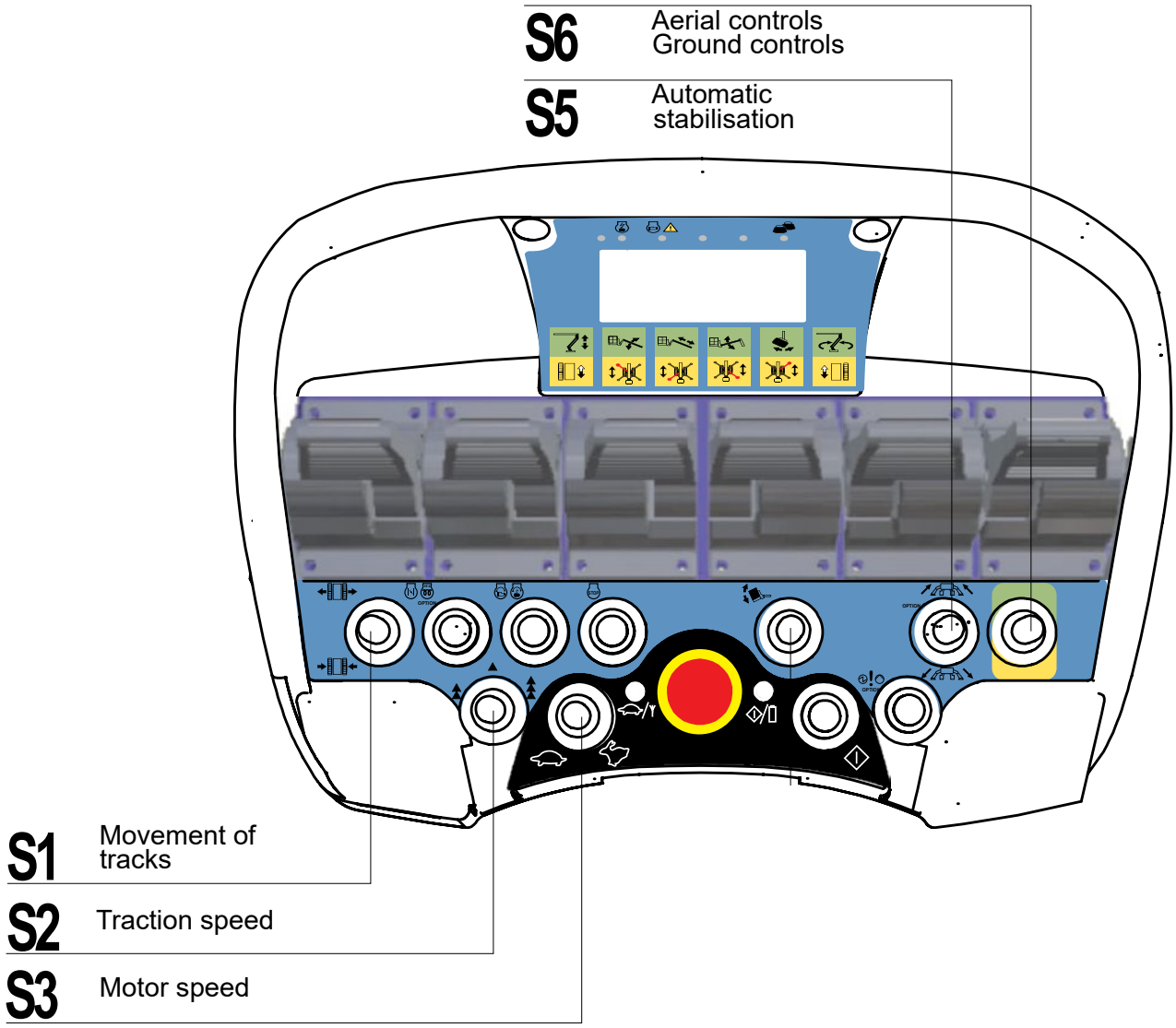
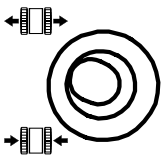


S1 - Movement of tracks



- Forward: widens the tracks.
- Backward: narrows the tracks.

Track widening is permitted when the machine is stowed away or stabilised.

S2 - Traction speed

- On the right: maximum speed.
- Centre and left: minimum speed.

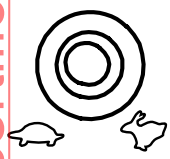
With use of petrol engine

The speed selection is active when the machine is stowed away.

With use of electric motor

Speed selection is not active, traction always takes place safely.

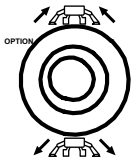
S3 - Combustion engine speed



- On the right: hare - higher number of revs.
- Left: tortoise - lower number of revs.

In some movements the engine uses the lowest rpm regardless of the position of S3.

S5 - Automatic stabilisation



- Forward: automatic destabilisation feet lifting.
- Backward: automatic stabilisation feet descent.

The necessary condition to perform the movement is the DISTRIBUTION BOOM HOUSED IN ITS SEAT.

The machine is levelled with a maximum error of 0.1° with respect to 0.

S6 - Movement selection

- Forward: the manipulators move the aerial part.
- Backward: the manipulators perform the traction, steering (M1-M6), ascent/descent movements of each individual stabiliser cylinder (M2-M3-M4-M5) for manual stabilisation.

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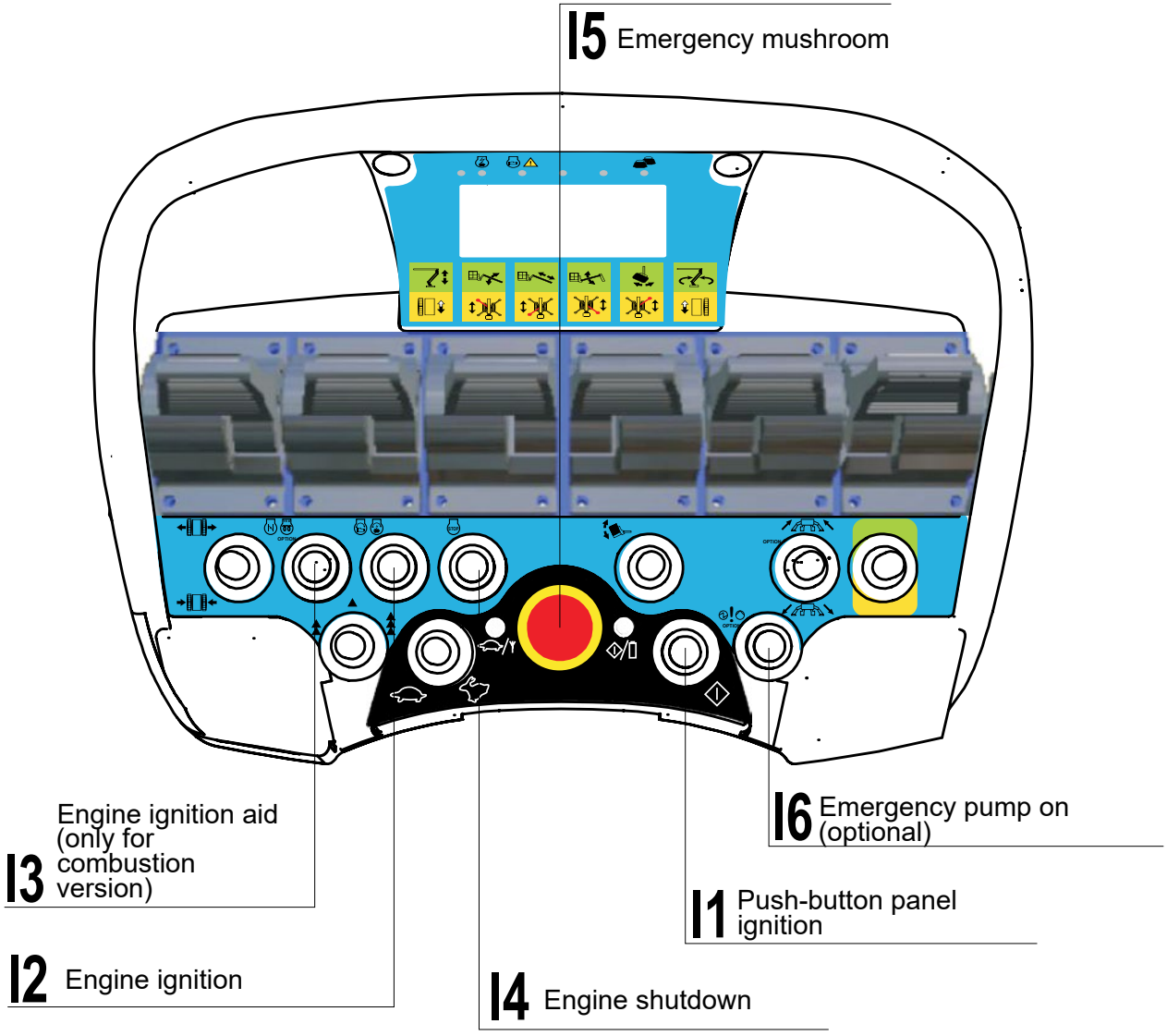
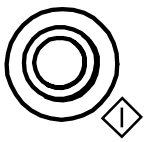
Switches



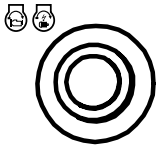
I1 - Push-button panel ignition



Switch I1 turns on the push-button panel.

Switch I5 is used to turn off the push-button panel.

I2 - Starting the electric or combustion engine



If the mains voltage is connected, the electric motor starts, if the mains voltage is not connected, the combustion engine starts.
To start the combustion engine cold see switch I3.

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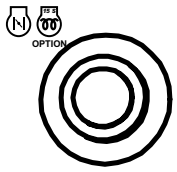
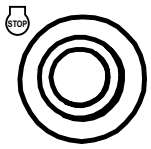
I3 - Engine ignition aid



It makes it easy to start the engine cold.

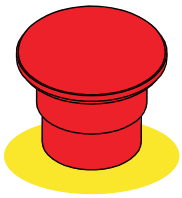
- **Petrol engine**: hold pressed simultaneously with I2 to activate the engine air.

I4 - Engine shutdown



It turns off the electric or combustion engine.

I5 - Emergency mushroom



If pressed, it locks the entire machine and turns off the push-button panel. To release, rotate it clockwise.

The push-button panel must be switched back on with I1.

I6 - Emergency pump on (optional)

It turns on the emergency electric pump (optional).

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Manipulators

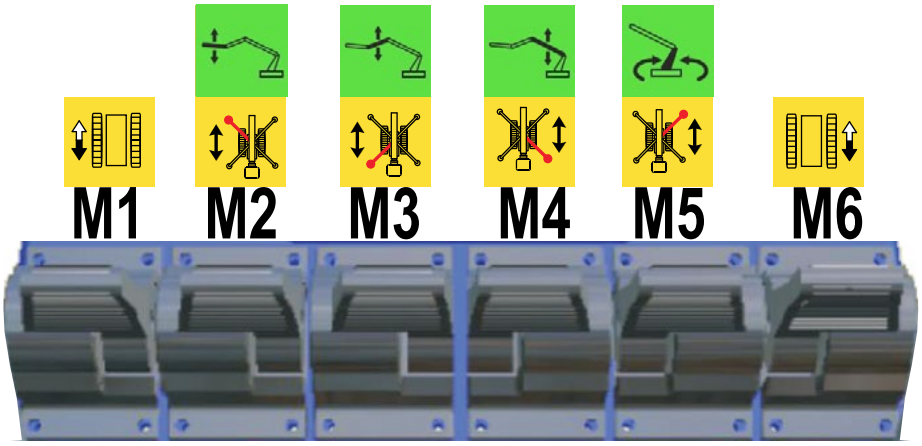

Table of manipulators operation according to the position of selector S6.

S6 forward Aerial part movements		
M1	No use	
M2 - THIRD BOOM	Forward	Closing
	Back	Opening
M3 - SECOND BOOM	Forward	Opening
	Back	Closing
M4 - MAIN BOOM	Forward	Ascent
	Back	Descent
M5 - TURRET ROTATION	Forward	Clockwise rotation
	Back	Anti-clockwise rotation
M6	No use	

S6 back Earth part movements		
M1 - LEFT TRACK	Forward	Forward
	Back	Back
M2 - STAB. FRONT LEFT	Forward	Ascent
	Back	Descent
M3 - STAB. REAR LEFT	Forward	Ascent
	Back	Descent
M4 - STAB. REAR RIGHT	Forward	Ascent
	Back	Descent
M5 - STAB. FRONT RIGHT	Forward	Ascent
	Back	Descent
M6 - RIGHT TRACK	Forward	Forward
	Back	Back

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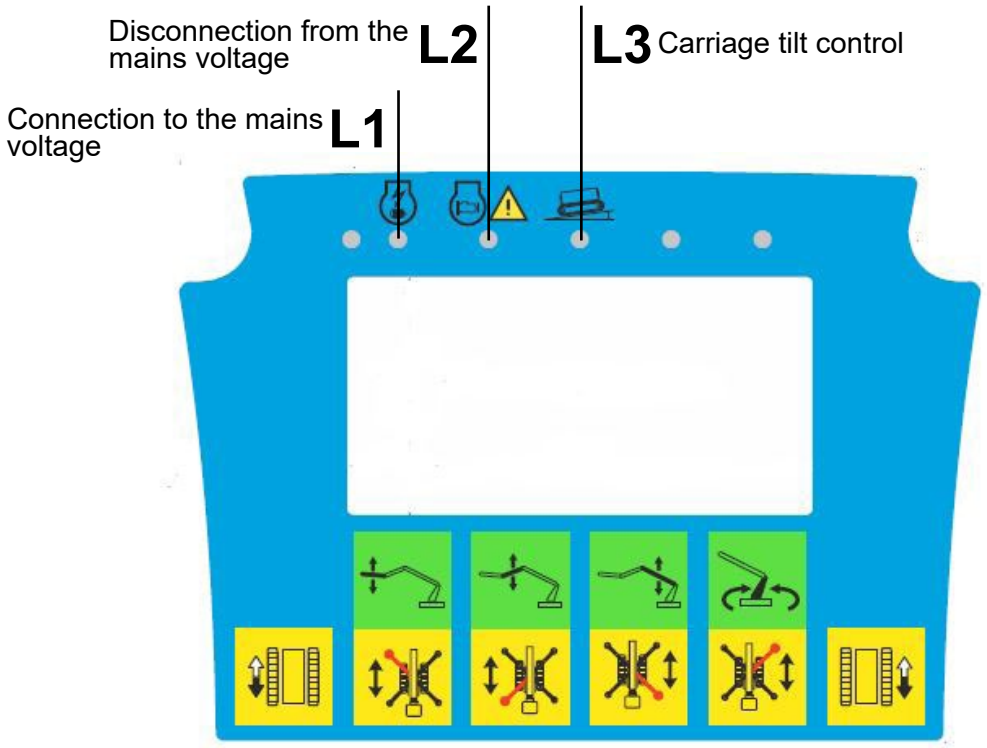
LED Bar

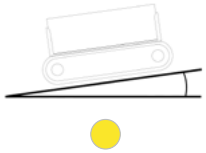


L1 - Connection to the mains voltage

Green light; if on the mains voltage is connected.

L2 - Disconnection from the mains voltage

Orange light; if on the mains voltage is disconnected. When the combustion engine is switched on, the light goes off.



L3 - Carriage tilt control

Orange light; it lights up, signalling a pre-alarm and then the alarm if the inclination of the carriage in translation or during work with the machine stabilised reaches the permitted limit values.

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Display

The display shows:

- Engine status
- Work thresholds
- Machine status

Engine status

Petrol combustion engine on

Oil in the engines

- Petrol engine: the oil level is too low.

Alternator and ignition battery status

- Off after start-up: the alternator works.
- Fixed on: the alternator is not working.
- With the engine off if it flashes it indicates that the starter battery is low.

Oil filter clogged

- The oil filter of the hydraulic circuit is clogged and must be replaced as soon as possible. All machine movements are slowed by 40% of the maximum permitted.

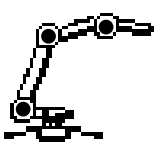
Work thresholds

Excessive tilt

- The icon signals, both during the translation phase (with the machine closed and with the machine open) and when the machine is stabilized, if the inclination thresholds are reached and exceeded.
- Machine closed, flashing icon: when the first threshold is reached (reduction of traction speed and destabilizing movements in the air phase).
- Machine closed, fixed icon: when the second threshold is reached.
- Open machine, fixed icon and warning triangle: when the traction block threshold is reached.

Turret centering

- The icon indicates that the turret centering has been reached (threshold for the correct storage of the machine).



Traction enable status with machine open

- The icon signals the activation of traction with the machine open (all positioning constraints are satisfied).

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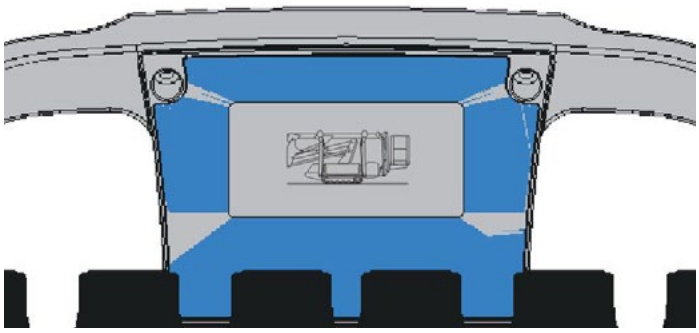
Machine status

The machine status is represented by the following icons

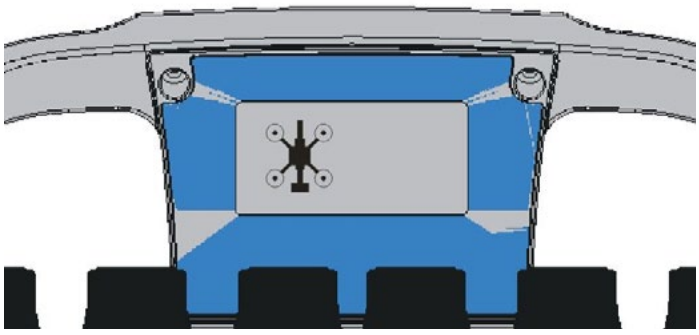
MACHINE STOWED AWAY

The machine is STOWED AWAY when the distribution boom is resting on the carriage support and none of the stabilisers are resting.



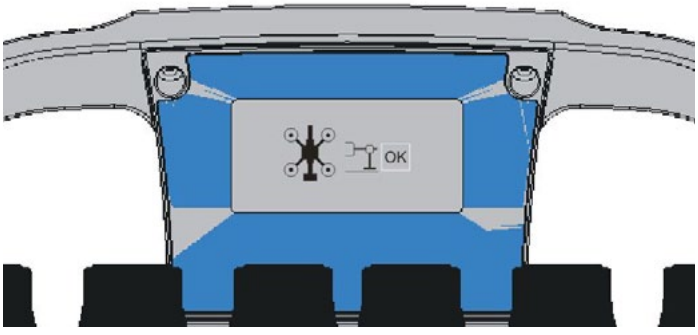
MACHINE STABILISED STOWED AWAY

The machine is STABILISED AND STOWED AWAY when all 4 stabilisers are resting, the turret is aligned and the distribution boom is resting on the carriage support.



MACHINE STABILISED STOWED AWAY AND LEVELLED

The machine is STABILISED STOWED AWAY AND LEVELLED when all 4 stabilisers are resting, the machine is levelled and the distribution boom is resting on the carriage support.



Visually check the actual levelling of the machine using the appropriate spirit level.

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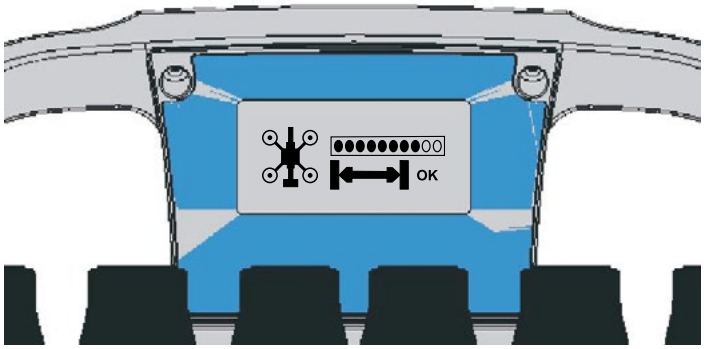
MACHINE OPEN

The machine is OPEN when all 4 stabilisers are resting on the ground and the machine is not stowed away.



If one of these icons appears on the display, the support of one or more stabilising feet has been lost.

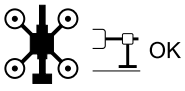
The machine is no longer stabilised.

Repeat the stabilisation step.

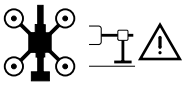
The machine IS STABILISED AND NO LONGER STOWED AWAY.

Movement of the stabilisers is blocked.

Lifting the main boom activates turret rotation; beyond 10° with respect to the fifth wheel plane, the movements of the second and third booms are activated.

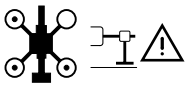


The machine is STABILISED, LEVELLED AND NO LONGER STOWED AWAY.



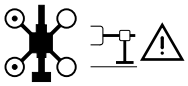
The machine IS TILTED OVER 1°.

The loss of levelling is not an optimal condition; however, the electronic system of the machine does not impose any blockage in the movements as it is however still safe. It is the discretion of the operator to continue using the machine or to close the aerial part and to return the machine to stability.



The machine HAS LOST THE APPLICATION OF A STABILISING FOOT

The electronic system of the machine does not impose any blockage in the movements as it is however still safe. It is the discretion of the operator to continue using the machine or to close the aerial part and to return the machine to stability.



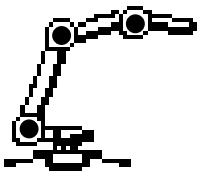
The machine HAS LOST THE APPLICATION OF TWO STABILISING FEET

Loss of the support of two stabilising feet is a dangerous condition.

Movements of the aerial part are blocked except for:

- lifting the main boom;
- closing the second boom;
- closing the third boom.

MACHINE WITH TRACTION ENABLING WITH MACHINE OPEN



The machine is ENABLED FOR TRACTION WITH THE MACHINE OPEN when all the constraints mentioned in the paragraph ‘enabling traction with the machine open’ are met.

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3. USING THE MACHINE

Before any operation read and understand this manual and the instructions on the plates and stickers.

Checks before use

Before commissioning and each use, the machine must be checked as indicated below; in addition, safety checks must be carried out when commissioning.

Make sure there NO:

- oil leaks from pipes or other hydraulic components;
- electrical conductors that are cut or disconnected;
- irregular cuts or wear in the rubber tracks;
- damage, deformations, loose or missing screws and bolts, cracked welds.

Check that:

- the ground to be worked on is hard and capable of supporting the maximum load transmitted by the crawling track and by the plate;
- the user manual is present;
- all the plates and stickers are present and legible;
- the work area is clear and free from unevenness or holes.

In addition:

- check the hydraulic oil level;
- make sure there is fuel in the tank;
- ensure the correct tensioning of the rubber tracks;
- first turn on the ground panel and then the push-button panel; wait approximately ten seconds for the end of the ignition sequence;
- make sure no errors are reported on the push-button panel display or on the ground box light indicators.

For periods of inactivity longer than 7 days, carry out at least 2 complete stabilizations (lower the stabilizers until the mechanical limit switch is reached) before using the platform.

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First use

- It is recommended to perform all the familiarisation operations with the distribution pipes EMPTY.
- The inside of new concrete pipes is rough and they must be “run in” with GROUT the first time they are used. This is done to avoid clogging inside the pipes.
- Flushing with grout must be carried out immediately before pumping.

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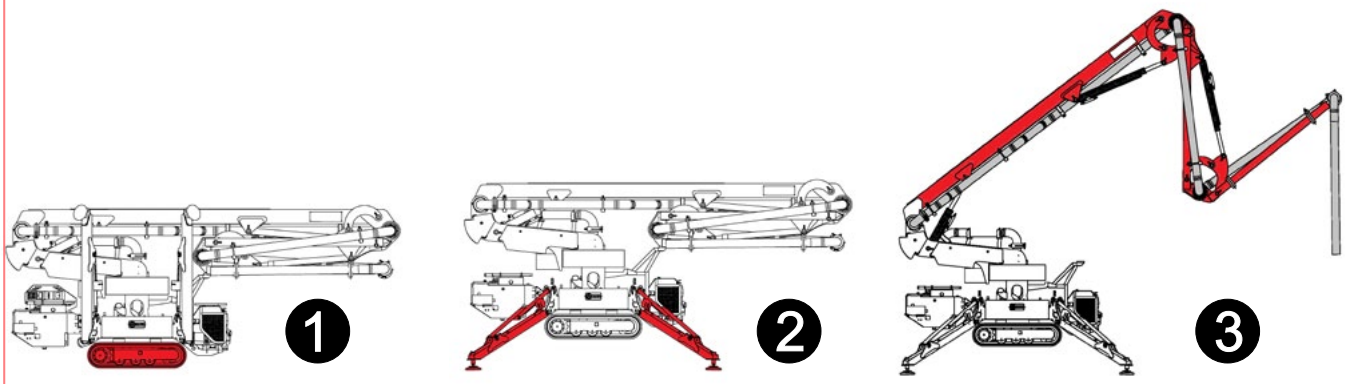
Mode of use

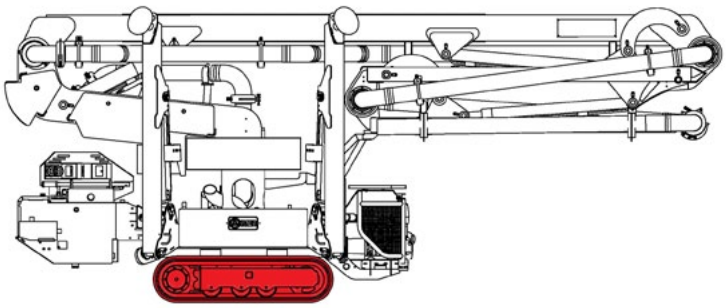
To operate the distribution of the concrete it is necessary:

1. move the machine to the work position by traction and steering;
2. stabilise it;
3. lift the main boom and move the aerial part until it reaches the position (if you intend to enable traction with the machine open, follow the instructions on page 44).

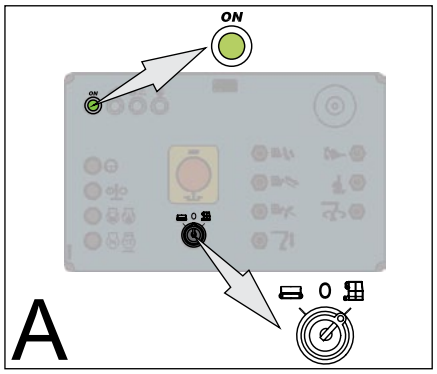


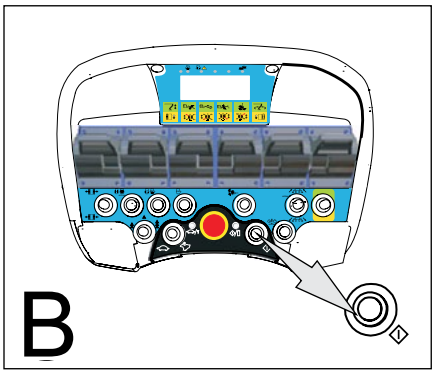
Make sure the red emergency stop button is not pressed on the ground panel and push-button panel.

1 Moving the machine to the work position



Turning on the machine





A. Insert the key into the selector on the ground panel and rotate it to the right, the ON light will come on.

Upon each power on, the acoustic and light signals (lights and buzzer) turn on to check their efficiency. Wait for them to turn off before using the machine.

B. Turn on the push-button panel with I1.

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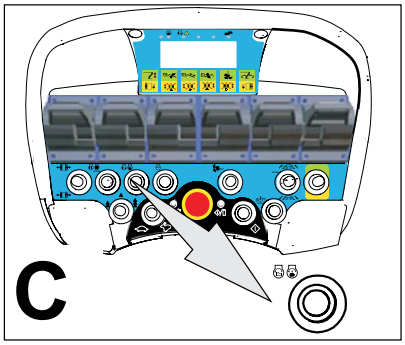
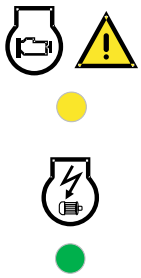
Starting the engine

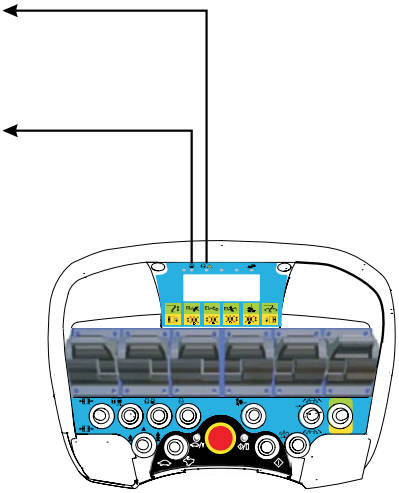
C. Start the combustion or electric engine with switch I2.





If the yellow light is on, the mains voltage is disconnected and the combustion engine starts.

If the green light is on, the mains voltage is connected and the electric motor starts.
The differential thermal magnet must be active.



Traction and steering

To perform traction the machine must be STOWED AWAY.

Performing traction from the ground with the push-button panel, maintain a distance of at least 2 meters from the machine.

Check that the work area is free from persons, animals and obstacles before making any movement.

Check the machine path for holes, ditches, unevenness, obstructions, debris and covers that could be concealing holes or other hazards.

Where the ground allows it, widen the tracks as far as possible to increase the stability of the machine.

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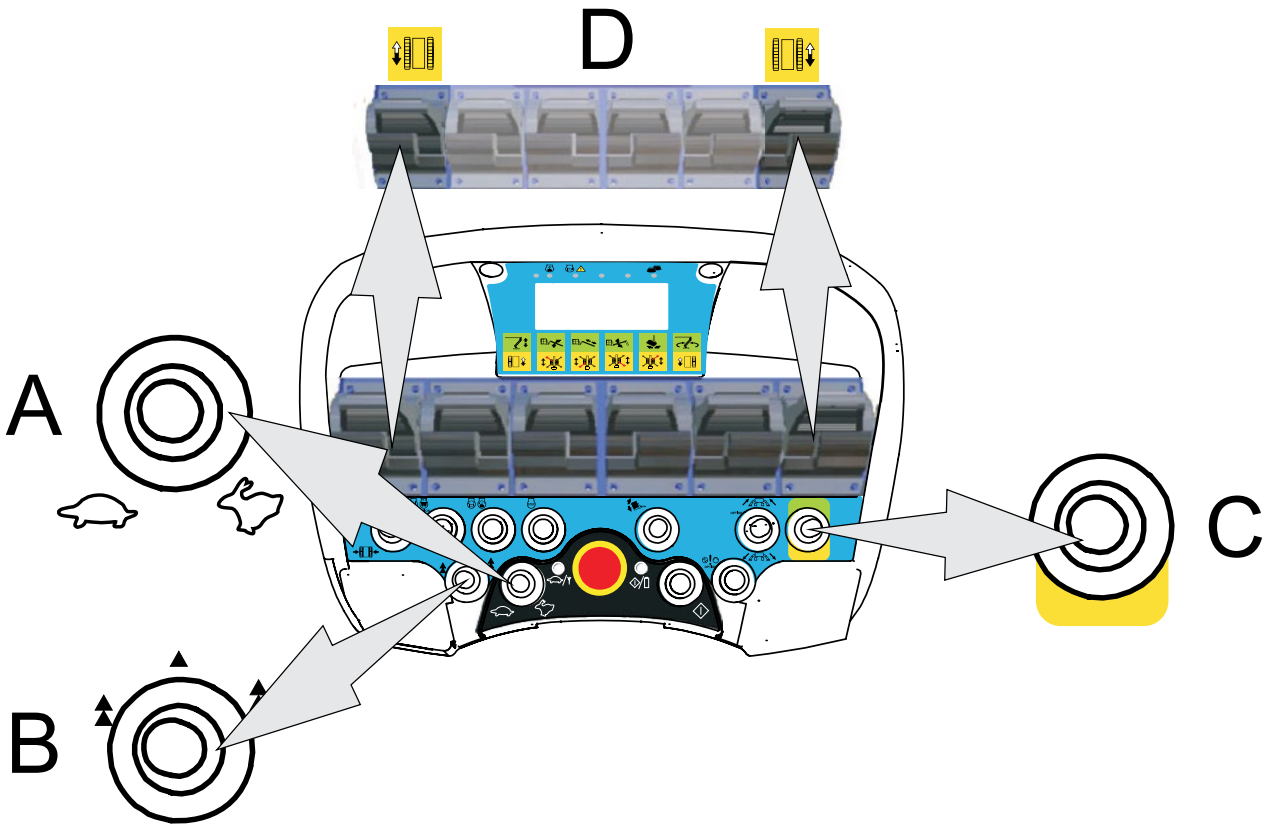


A With selector S3 **set the engine speed** (if using the combustion engine).

B With selector S2 **select the speed**.

C Bring S6 back to **activate ground movements**.

D Move the two crawling track manipulators M1 – M6 forward.

If necessary, **widen or close the tracks** with selector S1.

The track variation should be carried out possibly simultaneously with the traction.

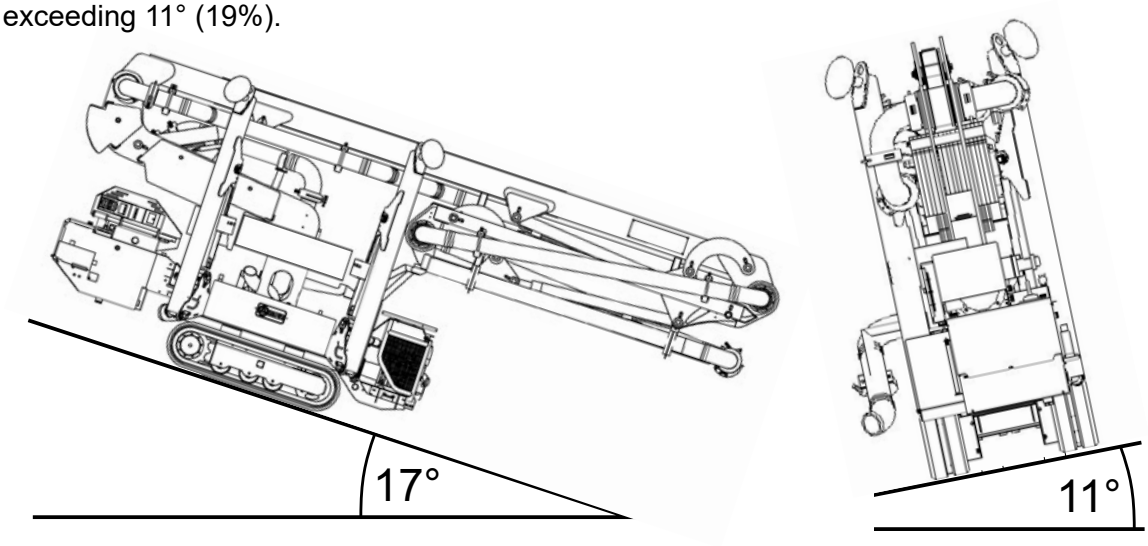
To steer, the crawling track speeds must be different so that **M1 and M6 have different inclinations**.

- **Steering right**: give more inclination to **M1.**
- **Steering left**: give more inclination to **M6.**

The 'HARE' speed is automatically entered if the proportionality of the manipulators exceeds 50%.

Driving on sloping terrain

- Do not drive the machine up or down on land with a slope greater than 17° (30%).
- When driving on side slopes, maximise the crawling track width to increase stability and lower the downstream stabilisers until they are close to the ground. Do not drive the machine on side slopes exceeding 11° (19%).



During traction the inclination of the carriage is continuously kept under control and a pre-alarm and an alarm are activated if safety limit thresholds are reached.

Pre-alarm

If the inclination of the carriage exceeds 10° longitudinal and/or 6° transverse, a pre-alarm is triggered consisting of:

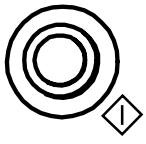
- an intermittent high-frequency acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with the same frequency as the audible alarm;
- the traction speed of the machine is automatically reduced.

Alarm

If the inclination of the carriage exceeds 17° longitudinal and/or 11° transverse, an alarm is triggered consisting of:

- a low frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with the same frequency as the audible alarm;
- machine traction is automatically blocked.

Override



In the event of a traction lock alarm, the operator can bypass the alarm for a limited time in such a way as to remove the machine from the excessive tilt situation.
To activate this function press the power button of the machine for 5 seconds. The change of acoustic and visual signals communicates the transition from the alarm situation to the pre-alarm situation described above.
At this point there are 30 seconds to manoeuvre at reduced speed and to exit the overtilt configuration.

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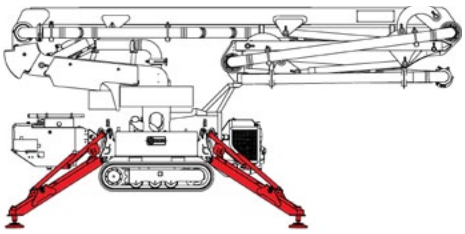
❷ Stabilising the machine

Once the machine is positioned, the next steps are stabilisation and levelling.



Movement of the stabilisers is only possible with the machine stowed away.

Automatic levelling is only an electronic aid that greatly increases the ease of use of the machine. The following recommendations should not be overlooked for ease of use.

Before proceeding with the stabilisation operations, make sure that there are no persons in the range of the plates of the stabiliser cylinders.

Before starting the stabilisation operation, make sure that the ground under the stabilisers is horizontal (without unevenness or holes), with good adhesion and is able to withstand the maximum load transmitted to the ground by the stabilisers, reported by the plates applied on the machine.

If necessary, place robust weight distribution plates under the stabiliser plates.

Check that the stabilisers do not come to rest on manholes or pipes.

Stabilisation will be completed when the machine is placed in a horizontal position with a tolerance of less than 1°.

Stabilising the machine with a degree of inclination greater than that permitted can make it unstable and cause serious damage to property and persons
It is absolutely essential to work with the machine stabilised with inclination lower than the limit permitted by the manufacturer.

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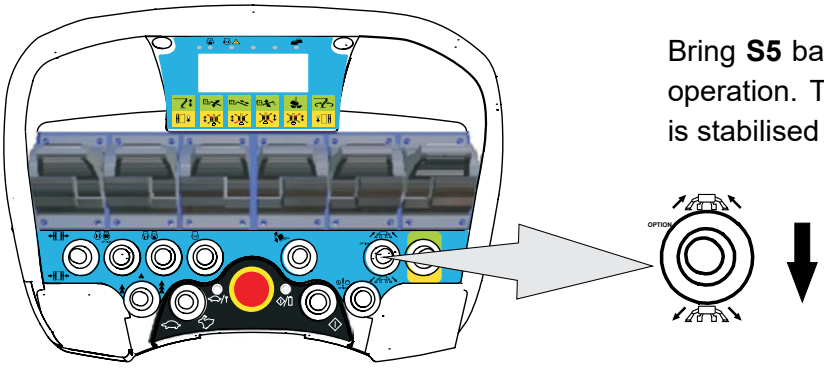
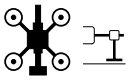
Automatic stabilisation



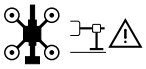
Bring **S5** back and keep it pressed throughout the operation. The stabilisers are lowered, the machine is stabilised and levelled.

When the icon appears on the push-button panel  display, the levelling has been reached and the movement automatically stops.

- Turn the selector back to neutral.
- To lift the carriage further off the ground, perform another automatic stabilisation.
- Always visually check the actual levelling of the machine using the appropriate spirit level.

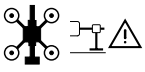
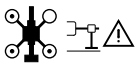
At the end of the automatic stabilisation, the manual foot movement manipulators are disabled.

With the distribution boom housed in its seat

- If the machine tilts more than 1°, the icon on the display becomes  indicating the loss of levelling.
- If the support of one or more stabilising feet is lost, the movements of the aerial part are blocked.

In both cases repeat the stabilisation phase.

With the aerial part open

- If the machine tilts over 1°, the icon on the display becomes  indicating the danger of tipping over.
- If the support of a stabilising foot is lost, the icon on the display becomes  : movements of the retraction aerial part that are not destabilising are permitted.
- If the support of two stabilising feet has been lost, the icon on the display becomes : the movements of the aerial part are blocked except for the movements that facilitate the return of at least 3 stabilising feet to support conditions:

  - lifting the main boom;
  - closing the second boom;
  - closing the third boom.

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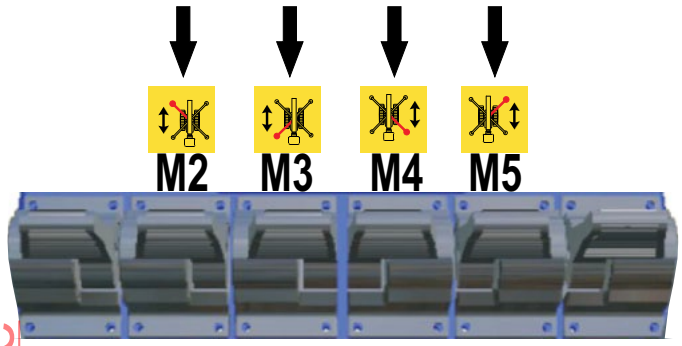
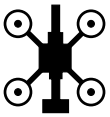
Manual stabilisation



Bring back the 4 manipulators **M2 – M3 – M4 – M5** to stabilise the machine.

The icon must appear on the push-button panel display:



A foot resting on the ground can no longer be lowered until all four feet are resting.

After stabilisation:

- check that the **tracks are raised off the ground**;
- visually inspect the actual **support of the cylinders**;
- visually check the**actual levelling of the machine** using the appropriate spirit level.

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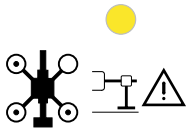
Carriage tilt control

Once stabilisation has been completed, the aerial part can be lifted and work can begin.

During work, inclination of the carriage is continuously kept under control and a pre-alarm and alarm are activated if the safety limit thresholds are reached.

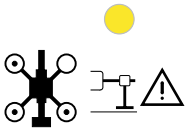
Pre-alarm



If the inclination of the carriage exceeds 1.2°, a pre-alarm is activated consisting of:

- a high-frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with a sequence of three flashes: short - long - short;
- a stabilisation alarm icon appears;
- all movements are permitted but their speed is automatically reduced.

Alarm



If the inclination of the carriage exceeds 1.5°, an alarm is triggered consisting of:

- a low frequency intermittent acoustic alarm;
- a light alarm: the orange light L3 on the push-button panel activates with a sequence of a long flash and a pause;
- A stabilisation alarm icon appears;
- the movements of the aerial part are blocked except for the movements that facilitate the return to pre-alarm conditions:
  - lifting the main boom;
  - lowering the second boom;
  - lowering the third boom.

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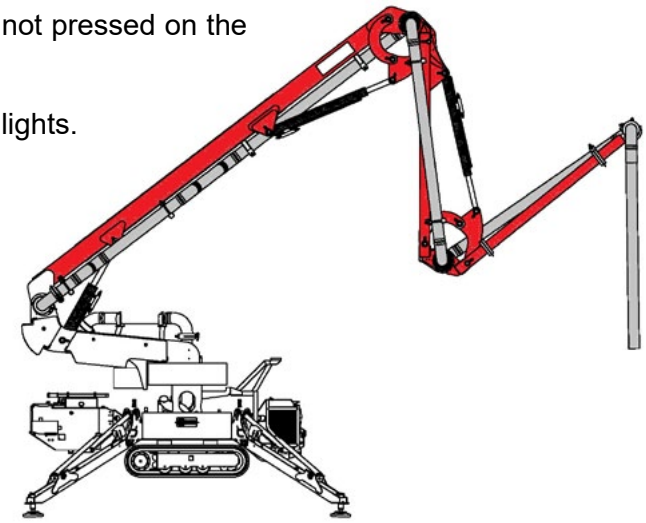
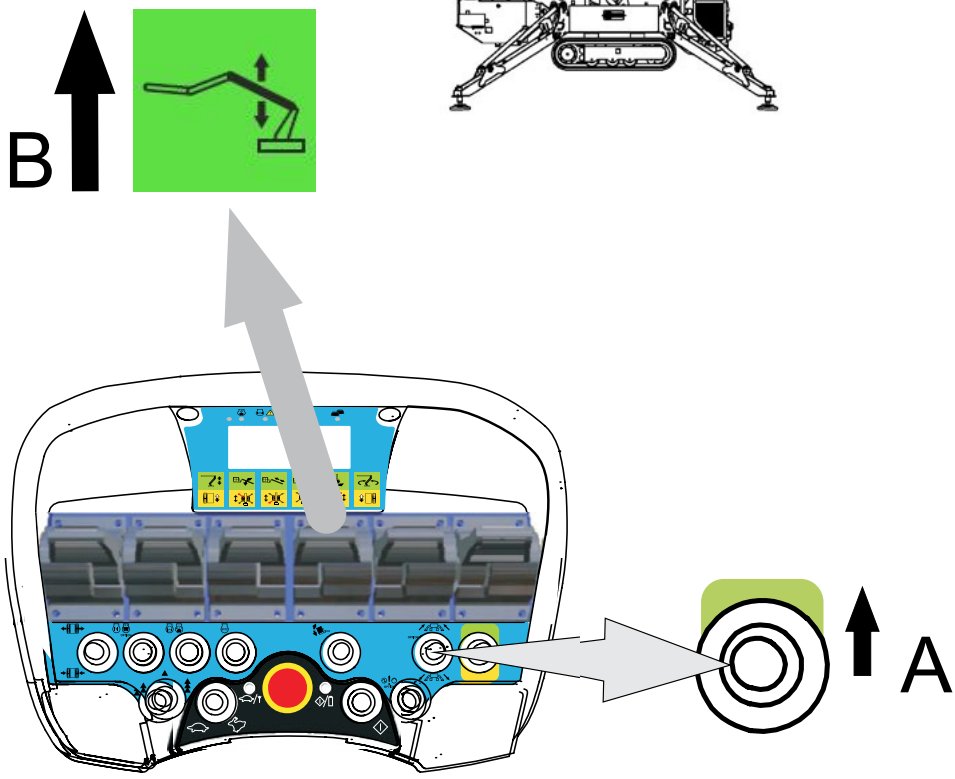
❸ Moving the aerial part

- Make sure the red emergency stop button is not pressed on the ground panel and push-button panel.
- Always check the situation of the emergency lights.





A Move forward **S5.**

B Lift the main boom by moving the joystick **M4** forward.

Lifting the main boom activates the turret movements controlled by joystick **M5.**

Lifting the main boom beyond 10° activates the movements of the aerial part controlled by joysticks **M2** and **M3**.

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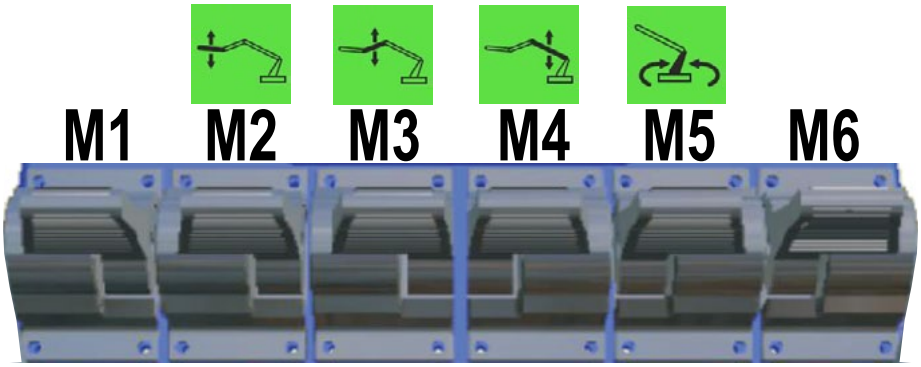

JOYSTICK		AERIAL MOVEMENT
M2 THIRD BOOM	Forward	Closing
	Back	Opening
M3 SECOND BOOM	Forward	Closing
	Back	Opening
M4 MAIN BOOM	Forward	Ascent
	Back	Descent
M5 TURRET	Forward	Clockwise
	Back	Counterclockwise

The turret movements are enabled when the distribution boom is detached from the support on the carriage (disabling the magnetic stowed away micro).

The movements of the second and third booms are enabled only with the main boom lifted by 10° with respect to the fifth wheel plane.

Make sure that the rubber end hose is free of any obstructions and that it does not get caught when the boom is opened and closed.

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Simultaneous aerial movements

When performing aerial movements at the same time the machine is automatically accelerated.

The movements of maximum two arms and of the turret can be operated in the various combinations of up/down and exit/return at the same time.

Single aerial movements are performed automatically by the machine at minimum engine speed without loss of performance.

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Enable traction with open machine

- For enabling and traction functions with the machine open, refer to the relative paragraph on page 44.

Aerial moves are not allowed if traction with open machine is enabled.

Using the distributor boom - recommendations

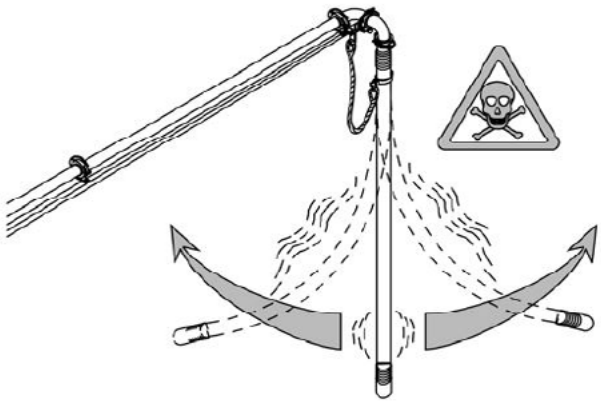
Before performing any operation, the operator must make sure that there are no dangers to him/herself or others.

It is forbidden to manoeuvre or hold the rubber end hose.

Do not stand within the operating range of the rubber end hose.

The sudden release of any blockages may result in violent whiplash.

Pay attention to the vertical swinging of the boom, caused by pumping concrete into the pipes.



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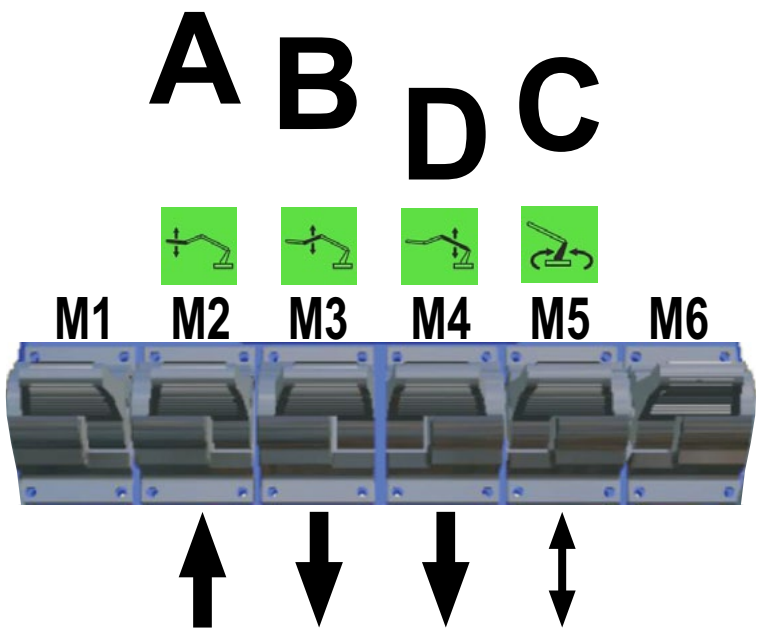
Return to machine stowed away

Once the work at height has been completed, return the machine to being stowed away.

If traction is enabled with the machine open, go back to the MACHINE OPEN status by lowering the stabilizers.

Retraction of aerial part



A Fully retract the third boom by pushing **M2 forward**.

B Fully retract the second boom by pulling **M3 back**.

C Rotate the turret with **M5** until it is perfectly in axis with the carriage.

D Close the main boom completely by pulling **M4** back.

The movements of the second and third booms are enabled only with the main boom lifted by 10° with respect to the fifth wheel plane.

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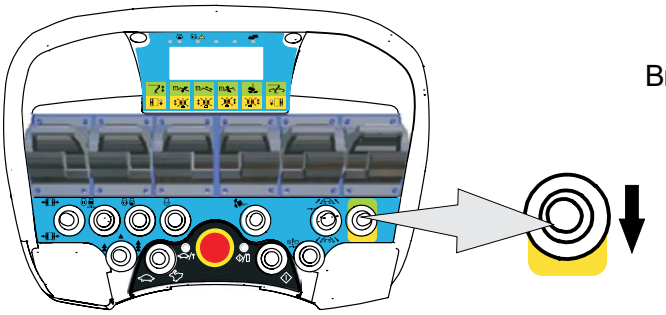
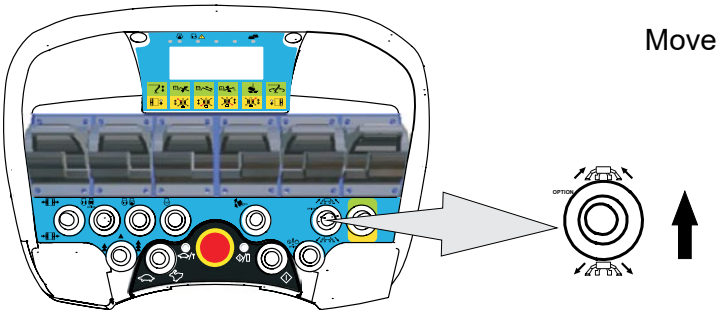
Retraction of stabilisers

Retraction of the stabilisers is only enabled with the distribution boom housed in its seat.



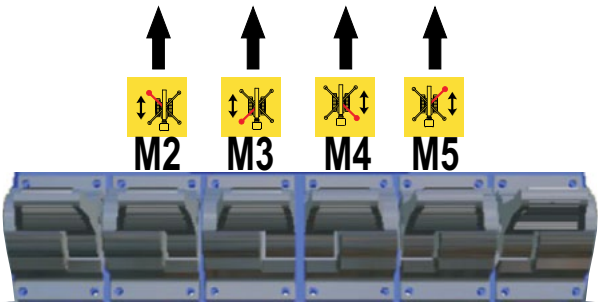
Bring **S6** back to **activate ground movements**.

Automatic procedure



Move **S5** forward until the movement is stopped.

Manual procedure



Move the 4 manipulators M2 – M3 – M4 – M5 forward to raise the feet.

At this stage there is no control over the movement sequence of the stabilisers. Pay close attention seeking to lower the machine while always keeping it as level as possible.

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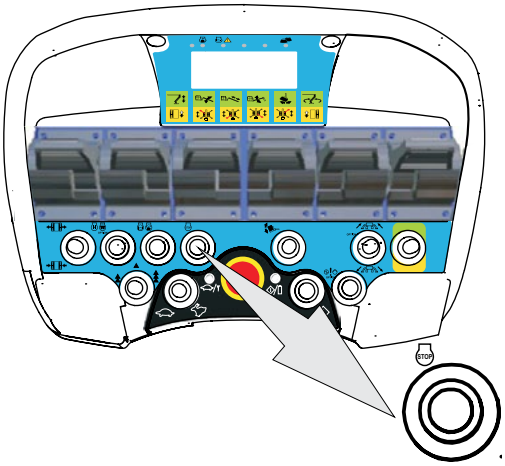
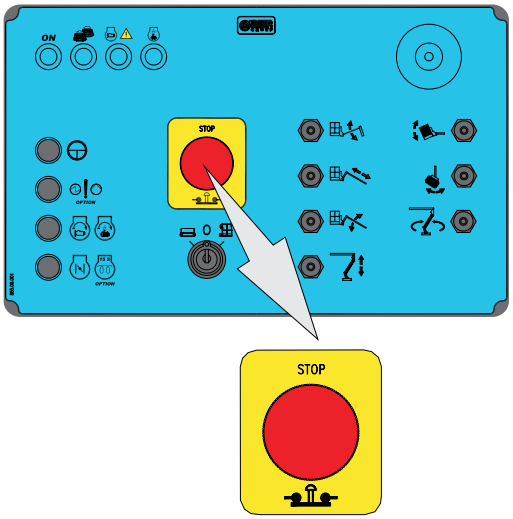
Turning off the engine



From the push-button panel

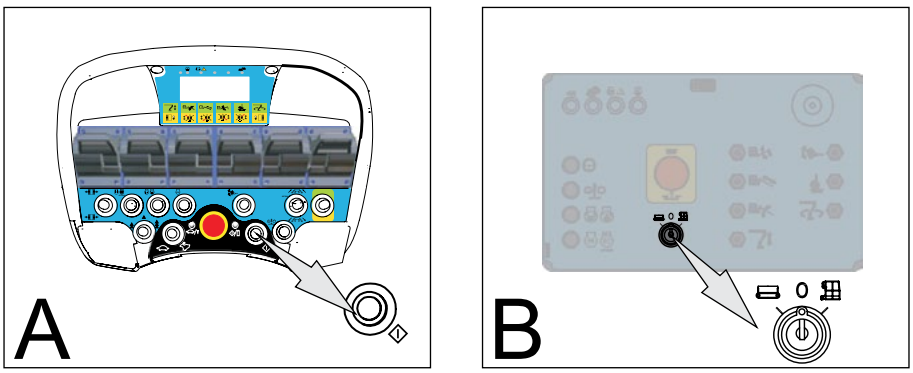
- Switch off the endothermic engine with switch I4.



From the ground control box

- Press the emergency button 2.

Turning off the machine



A . Switch off the push-button panel with switch I1.

B . Return the key to the central position in the ground control box.

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End of pumping and cleaning operations

Cleaning operations must not cause any damage to the environment.

The residual concrete and all materials resulting from the washing of the entire equipment must be managed in compliance with the regulations in force.

After each pumping cycle it is essential to carry out a thorough cleaning of the pipeline, in order to prevent concrete encrustations which could give rise to frequent clogging within the pipeline itself.

End of works

- Always remove the key from the selector.

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Emergency procedures

Emergency manual movements

If the machine stops due to a mechanical or electrical failure, it is possible to intervene returning it to the transport configuration by means of an operator on the ground.

In the **standard configuration** of the machine, the emergency procedure involves the use of the solenoid valves of the hydraulic blocks on the machine and the movements are carried out by means of a manual pump positioned on the side of the tank.

If the **optional 12 V electric pump** is installed on the machine, the movements are performed electrically.

There are two emergency procedures with the use of the 12 V electric pump depending on the type of problem:

- machine locked without alarm signals;
- machine locked in alarm.

The procedure to be followed when the machine is locked in alarm is the same as that used for the standard configuration with manual pump.

The 12 V electric pump is connected to starter battery. Prolonged use results in rapid discharge.

Before carrying out emergency movements, it is essential to ensure that there are no obstacles.

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Emergency manual descent procedure

When it is necessary to use the manual pump to put the machine in a safe condition and close it, this procedure should be followed in order to avoid destabilising movements, prevent a more dangerous situation from arising and avoid interference between the distribution boom and the carriage.

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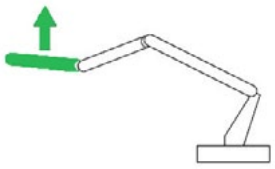
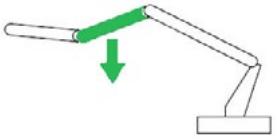
If traction is enabled with the machine open, first lower the stabilizers until all four are well rested on the ground.

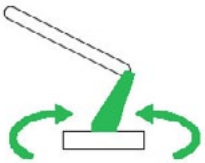
Phase 1: CLOSING the third boom.



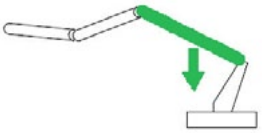
Phase 2: CLOSING the second boom.



Phase 3: ALIGNING the turret with the carriage.



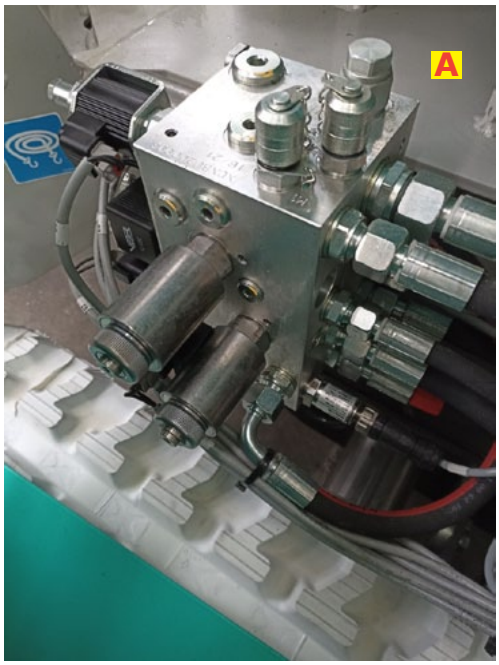
Phase 4: LOWERING the main boom.

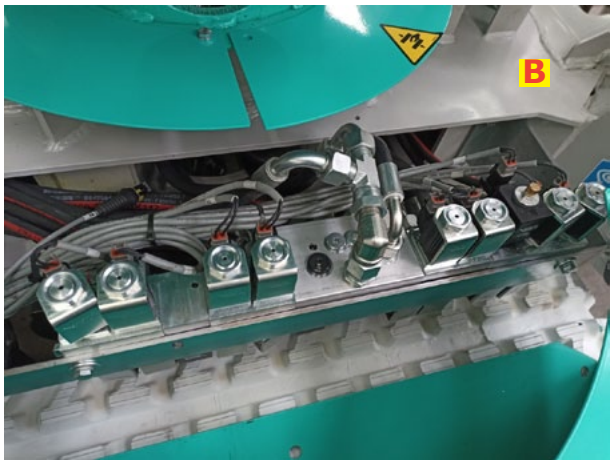


With manual pump

The main block is located in the right box (A); the handling blocks are located in the left box (B) and on the front side of the turret (C).

The manual pump is located on the left side of the tank.





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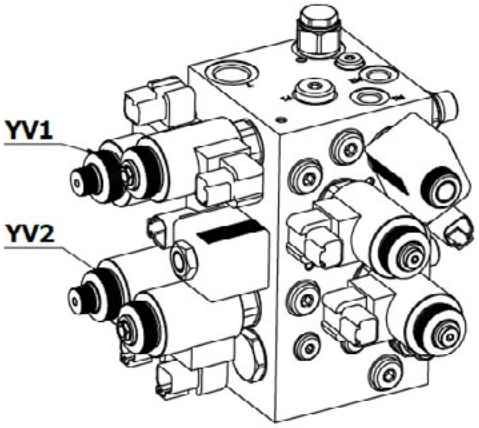
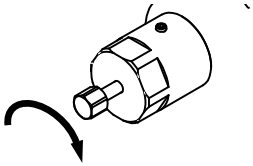
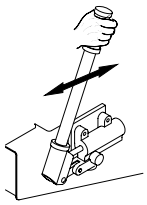
To perform a movement manually:

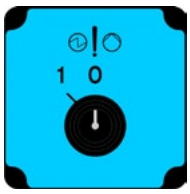
1. locate solenoid valve YV1 and YV2 on main block A;
2. screw the solenoid valve pawl without forcing it to the end of the stroke;
3. identify the required movement valve;
4. unscrew the coil ring nut and screw the pawl to open the valve box;
5. screw without forcing the pawl;





6. to perform the movement, operate the manual pump with the appropriate lever or, if present, operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete.





The 12 V electric pump start switch is located in the right box.

At the end of the operation, be sure to have returned the emergency solenoid valves to the initial setting as indicated below.

In MAIN BLOCK A:

1. fully unscrew the screw of valves YV1 and YV2.

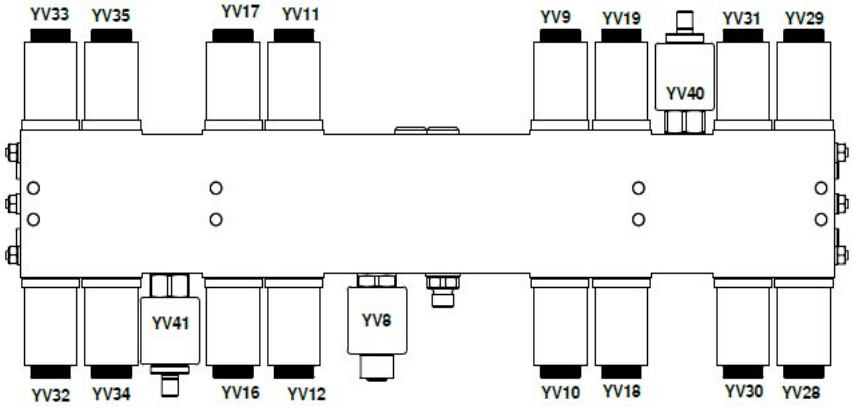
In BLOCKS B-C:

2. unscrew without forcing the solenoid valve pawl until the limit switch is reached.

Hydraulic blocks

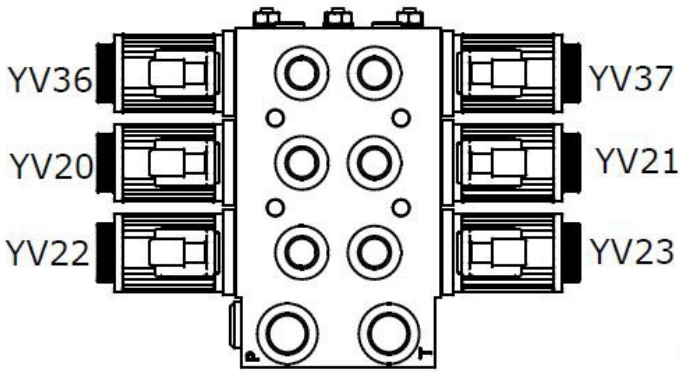
B

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



C

YV21	
YV20	
YV23	
YV22	
YV37	
YV36	



C

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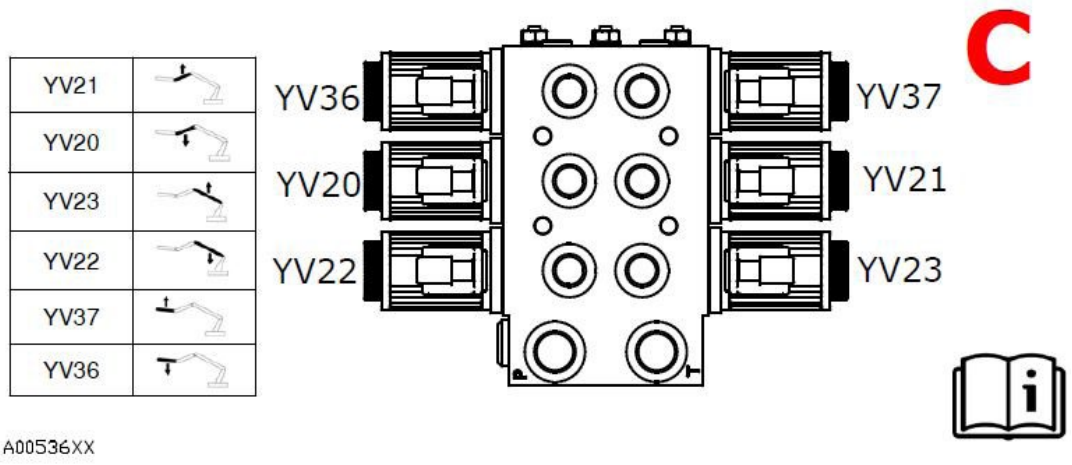
Example 1

It is necessary to **lower the main boom**:

1. motion is associated with solenoid valve YV22 of Block C;
2. screw the valves YV1 and YV2 of Block A;
3. unscrew the solenoid valve protection nut YV22 of Block C;
4. screw the emergency pawl without forcing it to the end of the stroke;
5. operate the manual pump with the appropriate lever until the boom is completely lowered or operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete;
6. unscrew without forcing the emergency pawl from solenoid valve YV22;
7. screw the solenoid valve protective nut YV22;
8. unscrew valves YV1 and YV2 of Block A.



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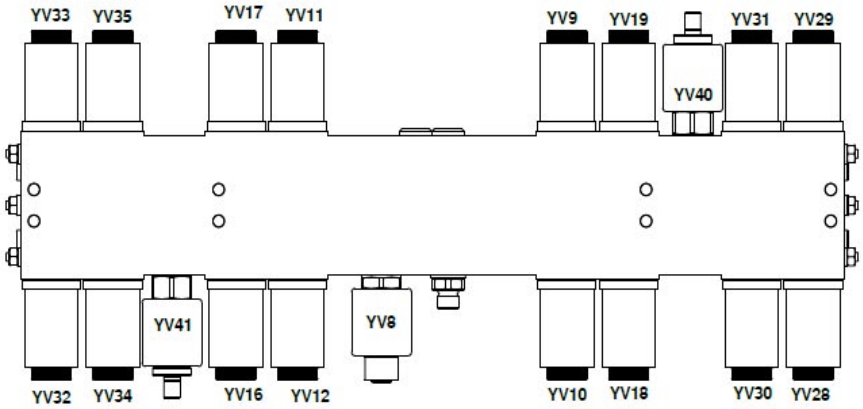
Example 2

It is necessary to **lower the left rear stabiliser**:

1. motion is associated with solenoid valve YV29 and YV40 of main Block B;
2. screw the valves YV1 and YV2 of Block A;
3. screw the solenoid valve YV40 of Block B;
4. unscrew the solenoid valve protection nut YV29;
5. screw the emergency pawl to the end of the stroke without forcing;
6. operate the manual pump with the appropriate lever until the stabiliser is completely lowered or, if present, operate the 12 V electric pump by turning the start switch to position 1 keeping it there until the movement is complete;
7. unscrew the solenoid valve pawl YV29 without forcing it;
8. screw the solenoid valve protective nut YV29;
9. unscrew the solenoid valve YV40;
10. unscrew solenoid valves YV1 and YV2.

YV32 + YV41		YV9	
YV33 + YV41		YV10	
YV34 + YV41		YV11	
YV35 + YV41		YV12	
YV28 + YV40		YV16	
YV29 + YV40		YV17	
YV30 + YV40		YV18	
YV31 + YV40		YV19	



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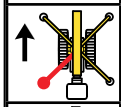
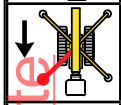
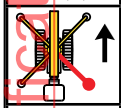
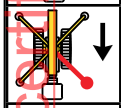
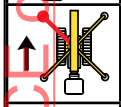
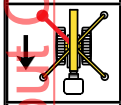
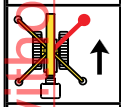
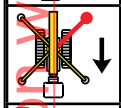
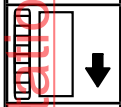
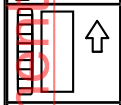
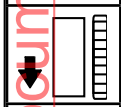
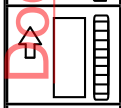
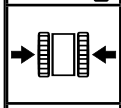
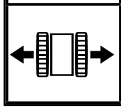
On this page and on the next there are 2 tables that summarise solenoid valves and movements. Always close solenoid valves YV1 and YV2 before carrying out the emergency movement and loosen them at the end.

	B-YV40	B-YV28	B-YV29	B-YV30	B-YV31	B-YV41	B-YV32	B-YV33	B-YV34	B-YV35	B-YV9	B-YV10	B-YV11	B-YV12	B-YV16	B-YV17
	X	X														
	X		X													
	X			X												
	X				X											
						X	X									
						X		X								
						X			X							
						X				X						
											X					
												X				
													X			
														X		
															X	
																X

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	B-YV18	B-YV19	C-YV20	C-YV21	C-YV22	C-YV23	C-YV36	C-YV37
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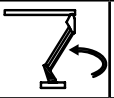
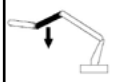
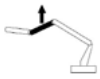
		X						
			X					
				X				
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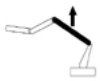
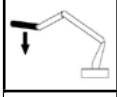
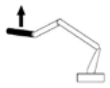
						X		
							X	
								X

Procedure with machine locked without alarm signals - With 12 V electric pump (optional)

The 12 V electric pump is connected to the starter battery: prolonged use results in rapid discharge.

Make sure that the machine is not connected to the 120 V mains or that the differential thermal magnet is deactivated.

In models with radio control the push-button panel must be switched on.

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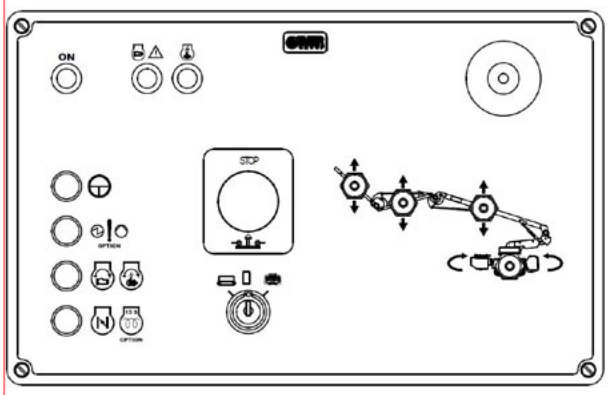
From the ground

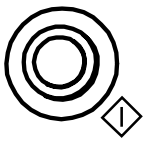
Perform the following operations from the ground control panel:



1. turn the key on the selector to the left;
2. press the button to turn on the 12 V electric pump;
3. press and hold the man button present and simultaneously move the selector of the movement to be performed.

From the push-button panel

1. From the ground control panel turn the key on the selector to the right;
2. turn on the push-button panel with I1;

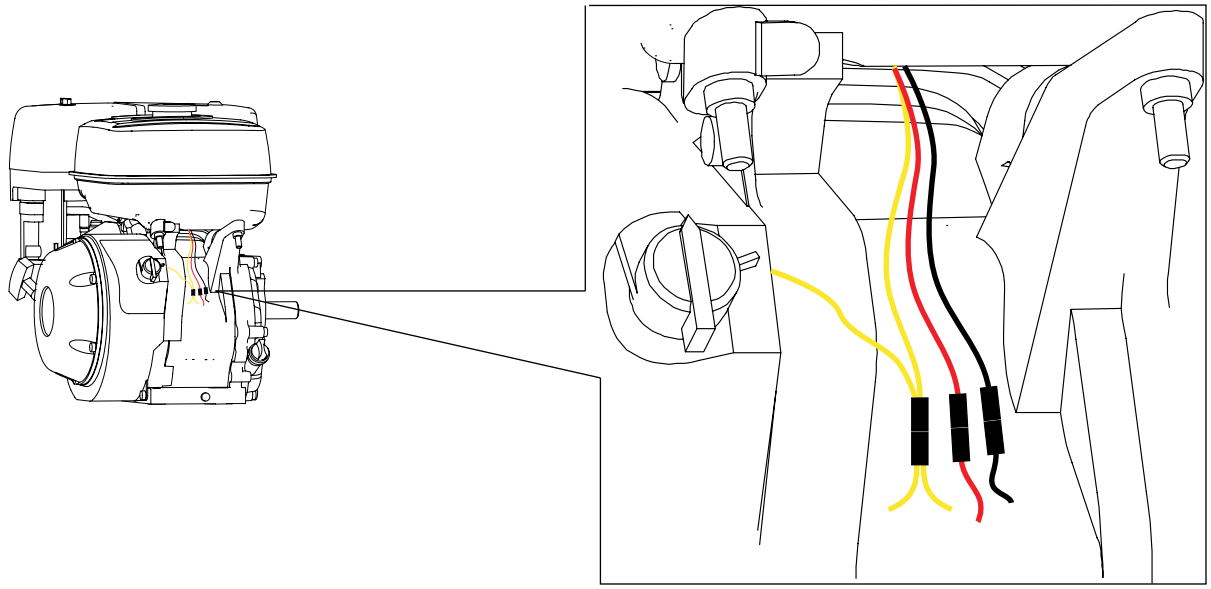


3. press switch I6 to turn on the 12 V electric pump;
4. move the joystick of the movement to be performed.

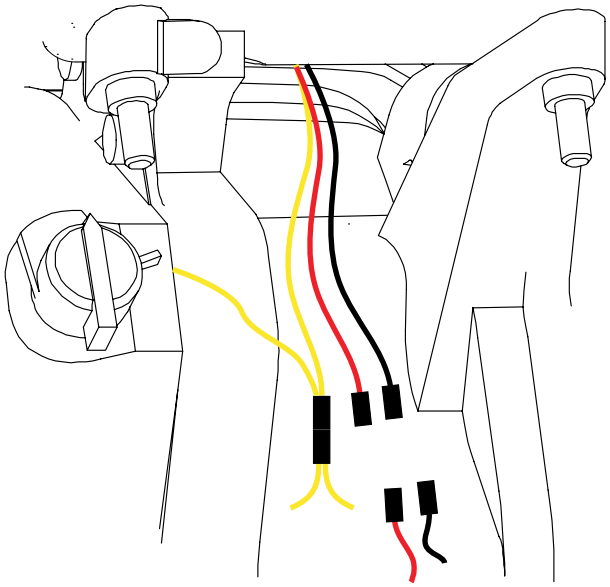
Manual starting of the combustion engine

Petrol engine

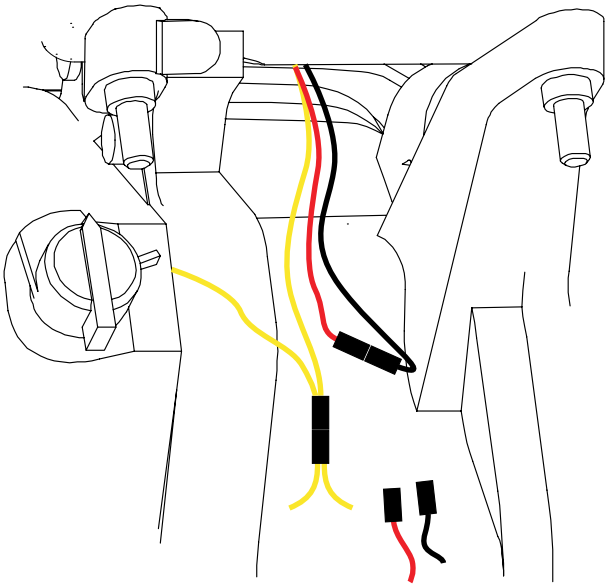
1. On the right side of the engine identify the 4 wires indicated in the figure (2 yellow - 1 red - 1 black).



2. Disconnect the red and black wires from the respective connectors.



3. Connect the two terminals.



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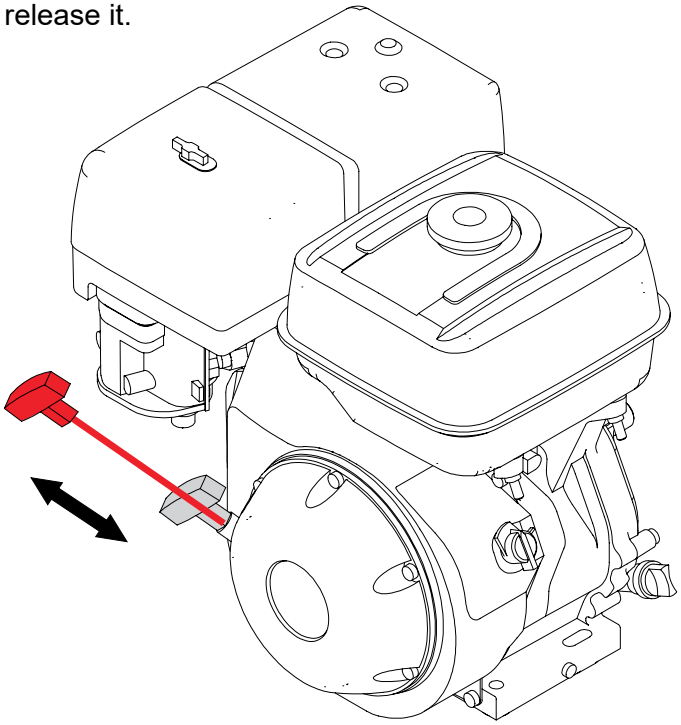
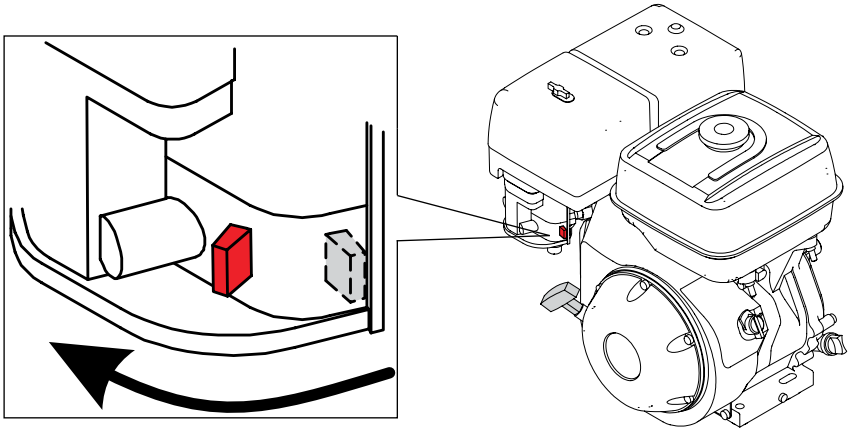
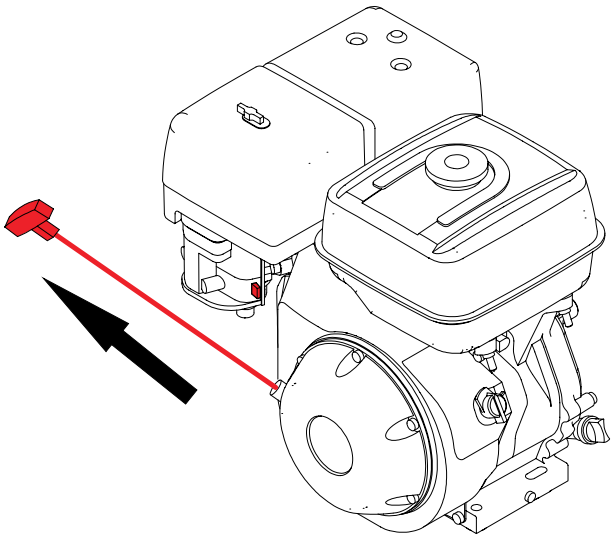
4. Pull the engine ignition lever until it resists and release it.



5. Pull the air lever outwards.



6. Pull the lever firmly.



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Battery charging

The icon on the push-button panel display, in addition to signalling the alternator fault (on steady), indicates the status of the ignition battery.

- Flashing on: the ignition battery is below the safety level and must be recharged.

To recharge, it is necessary to connect the machine to the 120 V mains and to activate the magnetothermic of the electric pump-charger.

The charger will turn on a green light while charging the batteries and a red light when it reaches full charge.

120 V line rectifier characteristics

- 12 V 12 A charger
- Power supply 85/264 V – 50/60 Hz
- Operating temperature from -10° C to +45° C
- IUoU charge curve
- Output short circuit protection
- Reverse polarity protection
- Weight 1.5 kg

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Transport

Make sure that the means used for transportation and/or lifting supports the weight of the machine.

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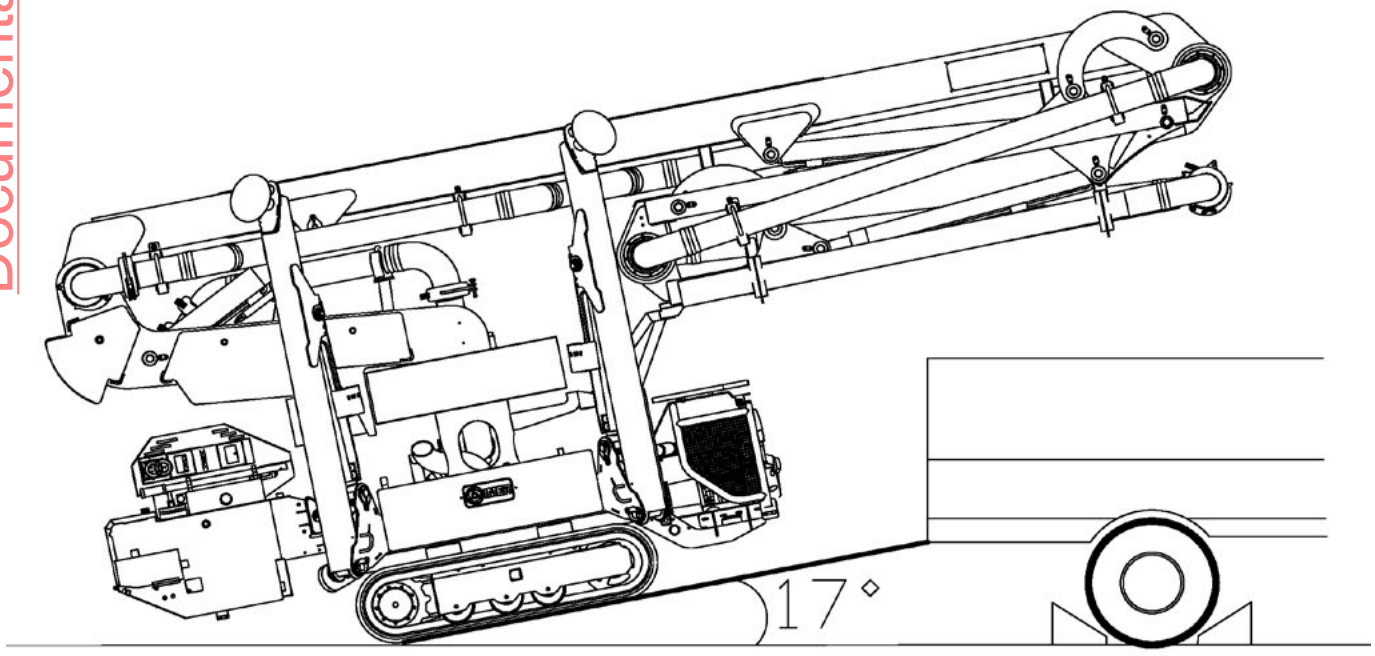
Machine loading and unloading

Loading and unloading of the machine on the platform of the means of transport can take place:

- using ramps;
- by lifting.

Using ramps

- Park the means of transport on a flat surface.
- Position the ramps parallel to each other, at a distance equal to that of the tracks and with an inclination not exceeding 17°.
- Always carry out loading and unloading operations by driving the machine from the ground while maintaining the safe distance.
- Proceed with caution, at the minimum speed to avoid bouncing of the machine.
- Place the machine such that no part of it exits the platform area.



By lifting

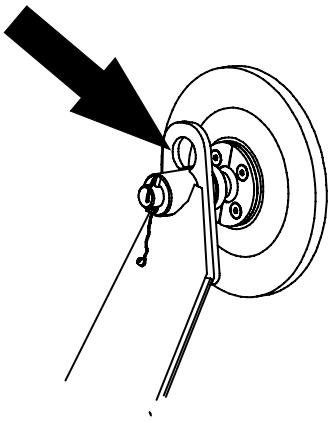
Lifting must be carried out with cranes, overhead travelling cranes or forklift truck.

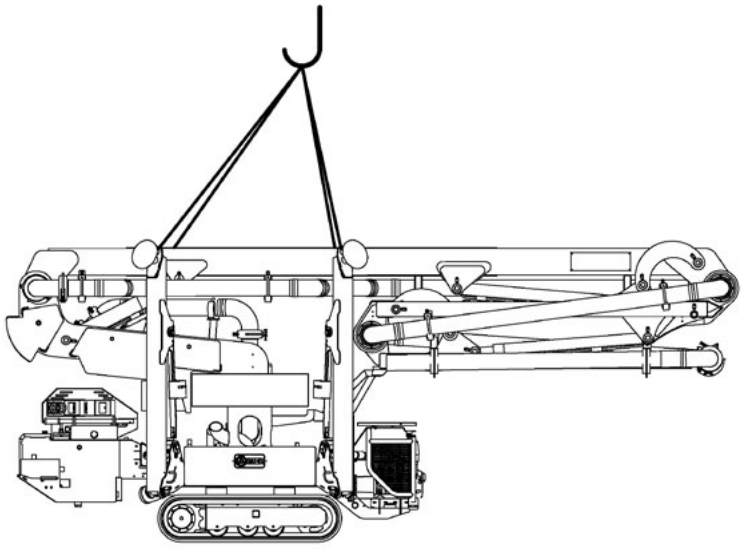
Use of cranes or overhead traveling cranes

Use straps, chains and hooks in a perfect condition.

- Lift the machine only when it is stowed away.
- The area involved in the lifting must be clear.
- Do not transit with the machine suspended over persons.

Hook the machine with ropes or chains passing through the 4 attachment points indicated by dedicated stickers.





Do not harness the machine in any way other than as shown as this could cause structural damage.

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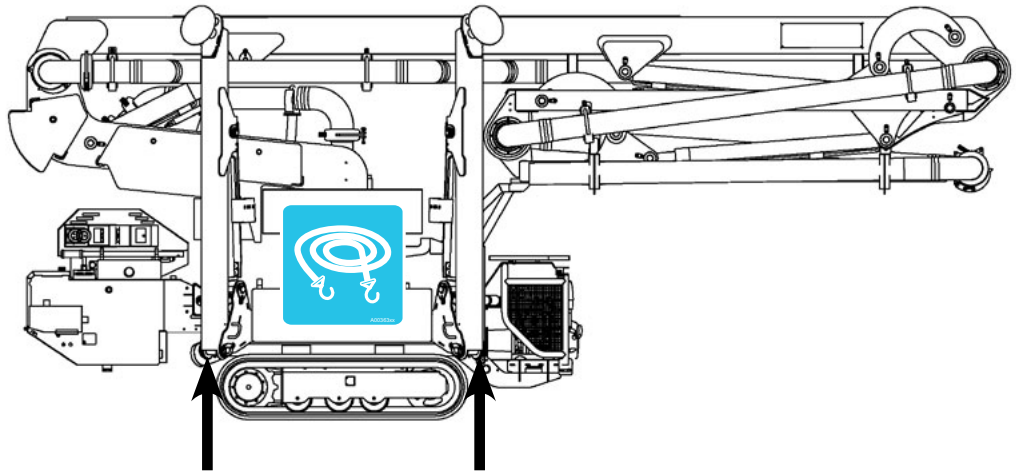
Securing the machine

For transportation, secure the machine to the floor of the vehicle with straps passing through the 4 attachment points, 2 front and 2 rear, indicated by dedicated stickers.



Do not secure the machine to points other than those indicated by the stickers.

It is forbidden to operate the machine when it is positioned on the platform of the means of transport.

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Storage

In case of long storage periods, store the machine, with the batteries fully charged in a dry and ventilated environment. If possible, leave the charger connected and powered to allow the batteries to be maintained, otherwise charge the batteries regularly every 2 months.

Storage temperature: -20/+50°C.

Before using the machine after a storage period of more than 90 days, carry out the checks shown in the summary maintenance table, under the item "after long periods of inactivity".

Disposal and scrapping

The machine mainly consists of steel, aluminium, plastic, synthetic rubber and copper.

Particular attention should be paid to the disposal of electrical batteries (Italian Legislative Decree 188/08) and of the hydraulic oil contained in the tank and inside the hydraulic circuit (Italian Presidential Decree 691/82).

The main components of the machine are listed below.

- Cast Iron
- Nylon
- Steel
- Teflon
- Copper
- Polycarbonate
- PVC
- Ertalyte

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4. MAINTENANCE

The long service life of the machine and maximum operating safety are guaranteed by careful and assiduous maintenance.

The times indicated in the maintenance summary table refer to normal conditions of use; in case of difficult working conditions (extreme temperatures, polluting atmosphere, high humidity, high altitude, etc.) they must be reduced.

The frequency and extent of periodic maintenance and checks may depend on the national regulations.

Perform normal maintenance operations with the distribution boom fully lowered and with the machine stowed away and switched off.

The handling or lifting of heavy parts must be performed using lifting equipment of adequate capacity.

Wear appropriate personal protection equipment during maintenance.

During maintenance, fence off the work area or display signs to prevent access to unauthorised persons.

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Cleaning the machine

At the end of each work shift or when it is deemed necessary, clean the machine:

- clean all surfaces with a compressed air blower, trying not to create accumulations of dirt;
- spray a normal degreasing product and remove any remaining dirt with cotton rags.

Never use thinner products, scrapers and steel brushes to avoid damaging painted surfaces.

Do not clean the machine using pressurised water jets; the penetration of water or moisture inside the electrical components could cause malfunctions and/or damage to the electrical/electronic control parts.

Cleaning the distribution boom

After each work shift or when deemed necessary, clean all parts of the boom that have been in contact with the pumped material or with additives and chemicals in general:

- do not direct jets of water at kingpins, cylinder rods and any parts of the electrical system;
- always make sure that the kingpins are free of concrete; even the cylinder rods must be perfectly clean.

Inspections summary table

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Inspections Summary Table				
Type	**Frequency**	**First responsibility**	**Service Qualification**	**Documentary references**
Pre-Start Inspection	Before each use and at each operator change	User or Operator	User or Operator	Use and Maintenance Manual
Pre-Shipping Inspection	Before each shipment or rental	Manufacturer or Renter	IMER Qualified Mechanic	Use and Maintenance Manual
Semi-Annual Check	Every 6 months	Renter	IMER Qualified Mechanic - Service Centre	Use and Maintenance Manual
Annual Check	Every 12 months; not more than 13 months from the date of the previous check	Renter	Service Centre	Use and Maintenance Manual
Preventive maintenance	Yearly	Renter	Service Centre	Use and Maintenance Manual

Maintenance summary table

An annual check by an authorised assistance centre is recommended.

OPERATIONS TO BE PERFORMED	AFTER THE FIRST 50 HOURS	EVERY DAY	WEEKLY	MONTHLY	100 HOURS OR 6 MONTHS	250 HOURS OR ANNUAL	AFTER LONG PERIODS OF INACTIVITY (90 days)
Checking of the plates and stickers		o					o
Check oil level				o			o
Replacing the oil filter cartridge	o					o	o
Greasing of the moving parts					o		o
Screw tightening check	o				o		o
Check the battery charge		o					o
Checking of safety devices		o					o
Emergency manual movements control					o		o
Checking the brakes					o		o
Checking of structures	o			o			o
Hydraulic pipe status check						o	o
Checking the power and auxiliary cables						o	o
Checking of performance						o	o
Rubber tracks maintenance	o				o		o
Check couplings		o					o
Rotate the pipes			o				o
Check pipes for wear				o			o

The following pages describe the operations shown in the table.

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Combustion engine maintenance

Below is the maintenance table of the petrol engine. Refer to the engine operation and maintenance manual annexed to the machine for explanations.

Petrol engine **OPERATIONS TO BE PERFORMED**	WITH EVERY USE	20 HOURS OR MONTHLY	50 HOURS OR 3 MONTHS	100 HOURS OR 6 MONTHS	300 HOURS OR ANNUAL
Engine oil level check	X				
Change engine oil				X	
Air filter check			X		
Clean air filter			X		
Replace air filter					X
Clean filter sump				X	
Check - adjust spark plug				X	
Replace spark plug					X

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Electric motor maintenance

Periodically check that:

- the engine operates without vibrations or abnormal noise;
- the air inlet from the fan cover is not obstructed;
- there are no traces of dust, oil or other impurities on the engine.

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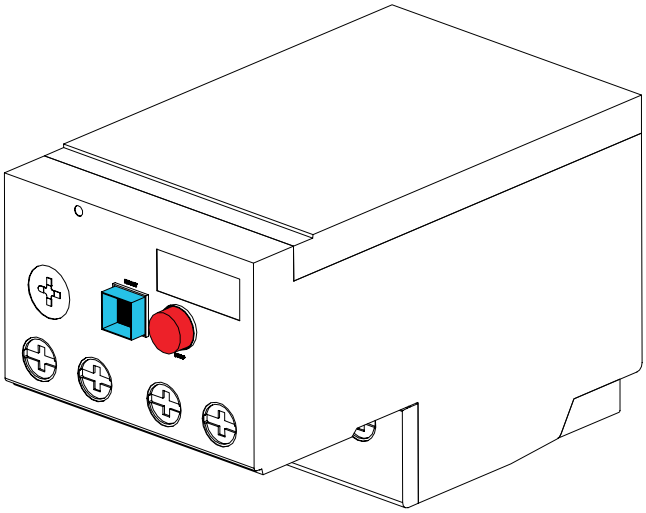
Thermal relay

To protect the electric motor from any current overloads, a thermal relay has been placed on the machine.

Perform the test for correct operation of the relay.

1. Open the thermal relay protection box.
2. Start the electric motor.
3. Press the red relay STOP button.
4. Check that the motor turns off.
5. Reset the motor with the blue reset button.



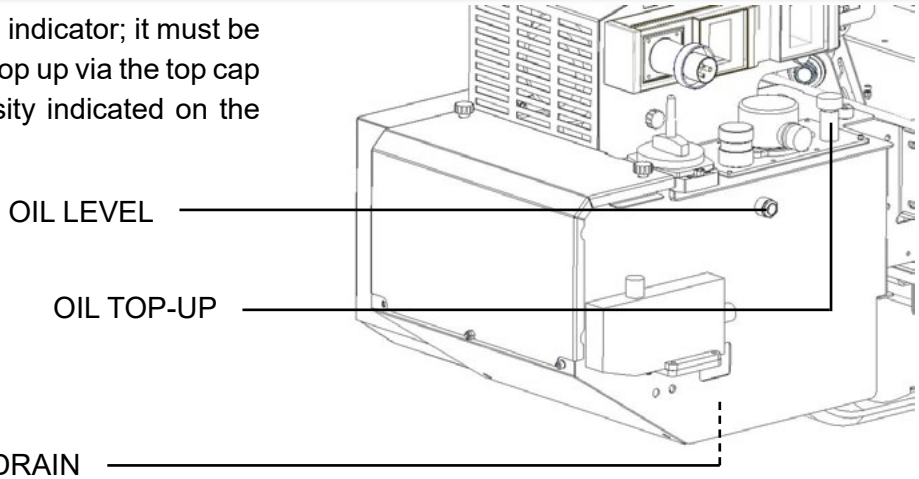
Checking of the plates and stickers

Check the presence and legibility of all plates and stickers.

Check the oil level and replace

The oil level check and any topping up must be carried out with the platform completely lowered.

Check the oil level from the indicator; it must be in the middle. If necessary top up via the top cap with oil of the same viscosity indicated on the tank.



The conditions of use of the machine and the quality of the hydraulic oil used eliminate the need to prescribe oil replacement at regular intervals. During the checks, check that the oil maintains its characteristics of clarity, colour and viscosity; if necessary, replace it.

However, IMER recommends replacing the oil completely every 3 years.

Complete oil replacement must be carried out with the machine stowed away.

For the total discharge of the oil, the tank is provided with a cap located under the tank itself.

- Discharge all the oil from the tank into a dedicated container.
- Close the drain plug.
- Add new oil from the filler cap.

Hydraulic oil is a polluting product.

Avoid the leakage of hydraulic fluid using collection tanks and guard against accidental leakage and spilling of hydraulic fluid with oil-absorbing products.

Used oil must be collected and not dispersed in normal drain pipelines; specialised companies are responsible for disposing of or possibly recycling industrial oils, under the protection of the laws in force in the individual countries.

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Replacing the oil filter cartridge

The first replacement of the cartridge must be carried out after the first 50 h of work to remove from the hydraulic system the processing residues of the pipes and hydraulic components.

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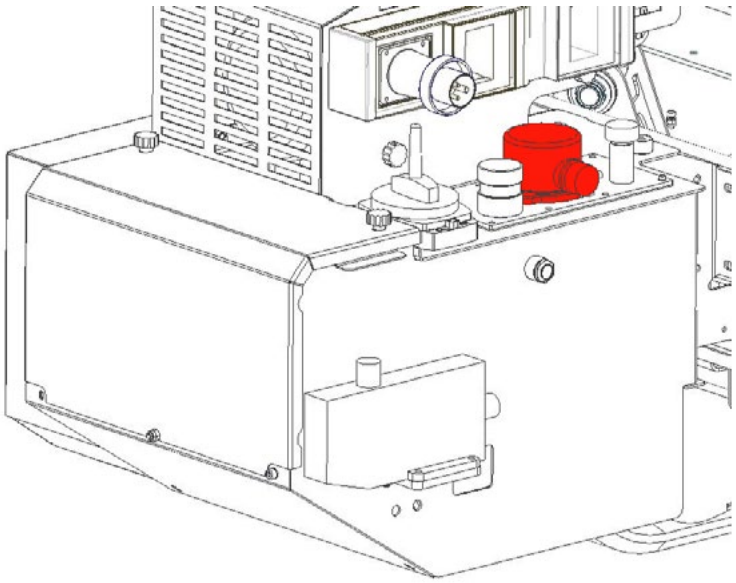
The cartridge must be replaced:

- at each oil change;
- according to the times provided in the maintenance table;
- when error code 556 appears on the push-button panel display and all movements are slowed down.



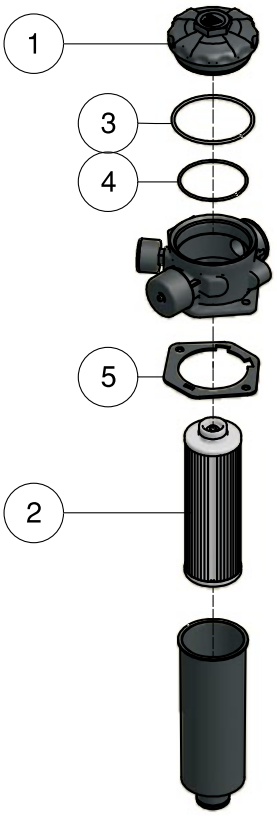
Before carrying out the operation make sure that the machine is switched off and completely lowered.

The operation involves the spillage of hydraulic oil and it is therefore advisable to equip yourself with containers for collection.

Filter unloading

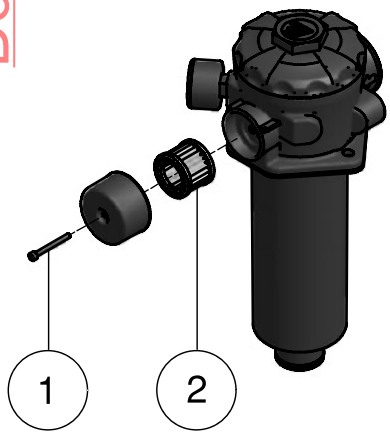
- Lift the distribution boom.
- Lower the distribution boom and during the descent check that the oil filter pressure gauge indicates a pressure below 1.6 bar / 23 psi (green area).
- If the pressure is higher, replace the filter cartridge.

Cartridge replacement



- Unscrew the upper filter cap (1).
- Remove the filter cartridge (2).
- Make sure that no particulate residues are deposited in the bottom of the container.
- Check that the O-rings (3 - 4) and gasket (5) are not damaged, otherwise replace and consequently correctly position them.
- Insert the new filter cartridge lubricating the sealing O-Ring beforehand.
- Screw on the cover paying attention to the thread inlet. Tighten with tightening torque of 30 Nm / 22 ft lb.
- Restart the machine for a few minutes.
- Make sure there are no leaks.
- Repeat the filter check operation.

Air vent filter



The air filter must be replaced each time the discharge filter cartridge is replaced.

For work in very dusty environments it is necessary to replace it more frequently.

Replacement

Remove the metal cap retaining screw (1).

Replace the air filter (2) and tighten the cap again, taking care not to overtighten to avoid crushing of the filter itself.

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Greasing of the moving parts

Coupling

- 3 greasers on the worm screw.
- 2 greasers at the sides of the toothed wheel carriage.

Stabilisers

- 1 on the cylinder.
- 1 on the pin.

Chassis

- All the cylinder pins have a grease nipple.

Check of screws tightening

DESCRIPTION	TYPE	Quantity	Tightening torque	
			Nm	kgm
Screws for fixing of the coupling to the turret	M16X110 UNI5931	12	250	25
	M16X60 UNI5739	4	250	25
Screws for fixing of the traction engine to the track-holder	M10x25 UNI5931	16	50	5
Screws for fixing of the motor to the traction wheel	M10x30 UNI5931	16	50	5

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Starter battery

The AGM battery does not require electrolyte level verification.

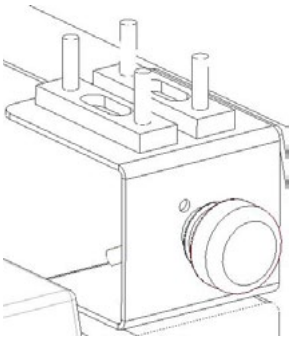
Clean the clamp contact surfaces, lubricate with antacid grease or petroleum jelly.

Battery charging

The battery charge level is visible on the push-button panel.

To recharge the battery, see paragraph "Recharging the battery".

Replacing the battery



- The battery is housed in the front of the carriage.
- Turn the battery disconnector OFF.
- Open the battery compartment protective cover.
- Disconnect the terminals from the battery always starting from the negative pole (-).
- Reattach the electrical cables always starting from the positive pole (+).

Replace the battery with one of equivalent characteristics.

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Checking of safety devices

The following test verifies the correct operation of all the safety devices of the machine.

The safety systems applied to the machine are inevitably subject to wear and calibration. It is therefore essential to monitor them and to keep them in a state of efficiency; it is also incorrect to blindly rely on their operation in the evaluation of operating and safety conditions.

Their presence cannot exempt the operator from responsibility for informed and adequate use of the machine.

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Red emergency stop button

- Press the emergency stop button from the ground control panel and check that no operation is possible either from the ground or from the platform. Return the button to the ON position.
- Press the emergency stop button from the push-button panel and check that no operation is possible from the ground or platform. Return the button to the ON position.

Combustion engine speed

Before carrying out the check, make sure there are no obstacles in the immediate vicinity of the machine.

None of the 4 stabilisers must be under pressure; the engine to be used is the combustion engine.

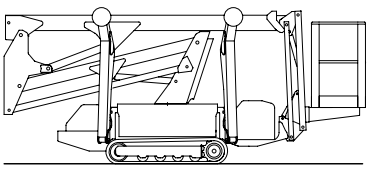
Start the test from the machine stowed away.

- From the push-button panel start the engine. Raise the arm until it stops. Check that the engine is not accelerated.
- Lower the arm until it is fully retracted, check that the engine can be accelerated.

Microswitches

SQ12

1. Bring the machine to the ***STOWED AWAY*** configuration and check that the icon push-button panel turns on:



2. In the machine ***STABILISED AND STOWED AWAY*** configuration, lift the main boom and exit the stowed away position: check that turret rotation is enabled.

Emergency manual movements control

See paragraph “Emergency manual movements”.

Checking the brakes

Good seal

The parking brakes must be able to hold the machine on the possible slope indicated in the “Technical data” table.

Check the good tightness of the brakes on a ramp with slope shown in the table above, in both directions.

Braking spaces

Perform the tests with the machine on level ground, with the combustion engine on and the engine speed on “hare”.

FAST GEAR

- Select the fast gear from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Release the manipulators and check that the braking space is less than 60 cm.

SAFETY GEAR

- Select the safety gear from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Release the manipulators and check that the braking space is less than 10 cm.

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Checking of structures

General

- Check the oxidation protection status of the mechanical structures and, if necessary, restore any rusty areas.

Base carriage

- Visually check the most important welds with penetrating liquids.
  - Load-bearing structure.
  - Wheel supports.
  - Joint pins.
  - Bushings; if necessary replace them by lubricating with grease.
  - Track status.

Turret and column

- Visually inspect or use liquid penetrant to check the most important welds (main boom hinge support).
- Check the correct positioning and fastening of the various components (fifth wheel, main boom hinge pins, etc.).
- Check the correct positioning and fastening of the ballasts.
- Check the condition of the fifth wheel and of the rotation pinion.

Distribution boom

- Visually inspect or use liquid penetrant to check the most important welds (main boom, second boom, third boom).
- Check the correct positioning and fastening of the various components (hinge pins, couplings, etc.).

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Checking of hydraulic pipes

Hydraulic oil is a polluting product.

Avoid the leakage of hydraulic fluid using collection tanks and guard against accidental leakage and spilling of hydraulic fluid with oil-absorbing products.

- Visually check all the hydraulic joints and tighten the fittings if necessary.
- Check the condition of the flexible hydraulic hoses; replace them if necessary.

Checking the power and auxiliary cables

Check the tightness of the electrical terminals, the correct positioning of the cables, the absence of corrosion and abrasion.

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Checking of performance

To carry out the checks shown below, it is necessary to use a stopwatch.

Perform the tests with the machine on flat ground, with the engine running.

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Safety mode

- Select the safety mode from the push-button panel.
- Bring the crawling track manipulators to the maximum forward movement.
- Check that the machine travels the distance of 10 m in a time greater than 65 s.

Lifting / lowering of the main boom

- Using the push-button panel lift the main boom and check that it takes about 40 s to complete the lifting movement.
- Lower the main boom and check that it takes about 30 s.

Turret rotation

- Select the turret rotation from the ground control panel and verify that it takes:
  - approx. 100 s to perform full rotation to the right;
  - approx. 100 s to perform full rotation to the left.

Opening / closing of the second boom

- Using the push-button panel open the second boom and check that it takes about 40 s to complete the movement.
- Close the second boom and check that it takes about 35 s.

Opening / closing of the third boom

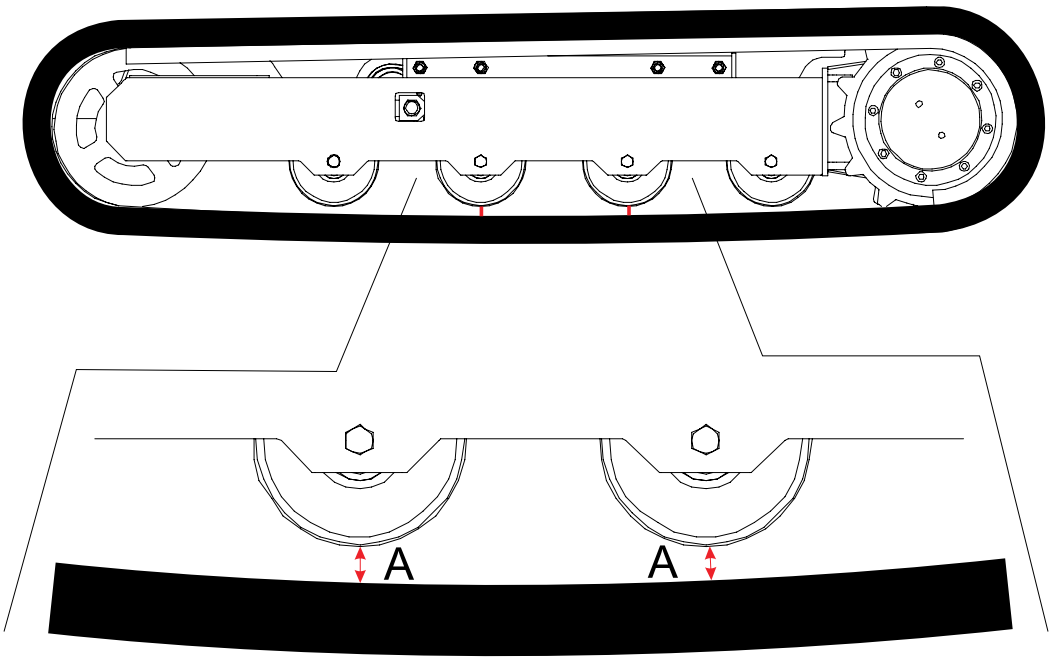
- Using the push-button panel open the third boom and check that it takes about 20 s to complete the movement.
- Close the third boom and check that it takes about 15 s.

Rubber tracks maintenance

Track tension check

- Bring the machine to solid and flat ground.
- Perform machine stabilisation.
- At the 2 central rollers measure the distance A between the outer part of the roller and the inner part of the rubber crawling track.

The tension is normal if the distance is between 10 and 15 mm.



If the value of A is not within the indicated values, the crawling track is loose or in tension; see the next paragraph “How to loosen - tension the crawling track”.

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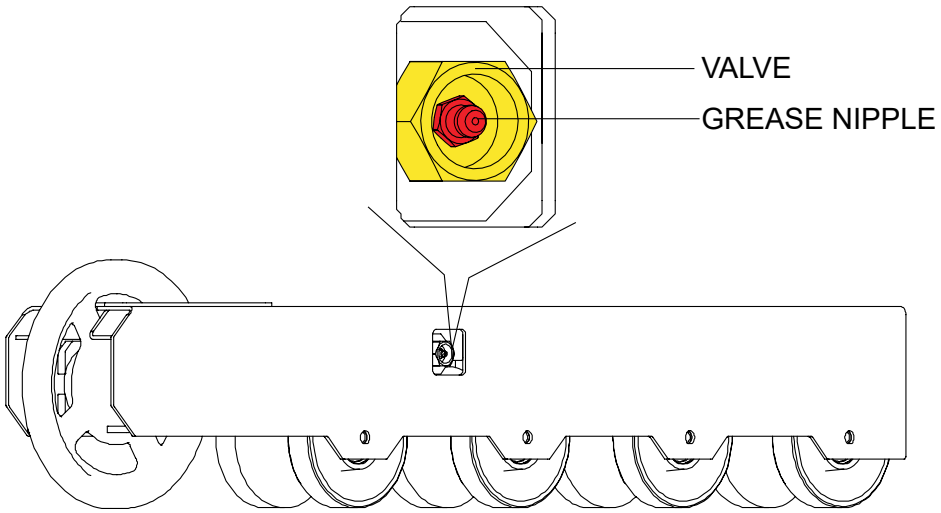
How to loosen - tension the crawling track

Perform the operations with the machine stabilised.

The grease contained in the hydraulic crawling track is under pressure. Do not loosen the valve by more than one turn; if the valve is loosened too much, it may be ejected under the effect of grease pressure. Never loosen the grease nipple.



To loosen the crawling track:

- slowly unscrew the valve anti-clockwise by no more than 1/2 turn to drain the grease; if grease does not come out, slowly rotate the crawling track;
- when the correct crawling track tension has been obtained screw and tighten the valve, turning it clockwise;
- clean away any grease that has leaked out.

To tension the crawling track:

- connect a grease gun to the grease nipple;
- add grease until the crawling track tension reaches the correct value.

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How to replace the crawling tracks

The following operations should be completed with the machine stabilised.

The grease contained in the hydraulic system is under pressure.
Do not open the valve more than one turn; if the valve is too much loosened up,
the pressure of the grease may eject it. The greaser may never be left open.

- Widen the span of the crawling tracks.
- Complete the following operation to loosen up the crawling track due for replacement:
  - slowly open the valve in the anticlockwise direction, not more than half a turn, to drain the grease. If the grease does not come out turn the crawling track slightly.
- Take the crawling track out.
- Before fixing a new crawling track, make sure that the direction of the drive is correct.
- Match the track links with the toothed wheel and then place the track of the tension wheel.
- Rotate the driving wheel in the reverse gear.
- Make sure that the links of the crawling track are correctly matched with the toothed wheel and the tension wheel.
- Adjust the tension of the crawling track.

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Check couplings

Check the tightness of the couplings:

- if a coupling shows traces of concrete, it means that it is not sealed properly;
- check that the gasket is correctly positioned;
- if the gasket is worn, replace it;
- check the condition of the lever couplings every day and replace them immediately with equivalent ones if they are deformed in any way.

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Rotate the pipes

It is advisable to rotate the pipes on their axis once a week to even out wear and increase their service life:

- rotate all concrete pipes by 120° clockwise and the elbows by 180° in order to even out wear and increase their service life;
- comply with the minimum values indicated in the “Check pipes for wear” chapter.

Check pipes for wear

Check the thickness of the concrete pipes using a thickness gauge:

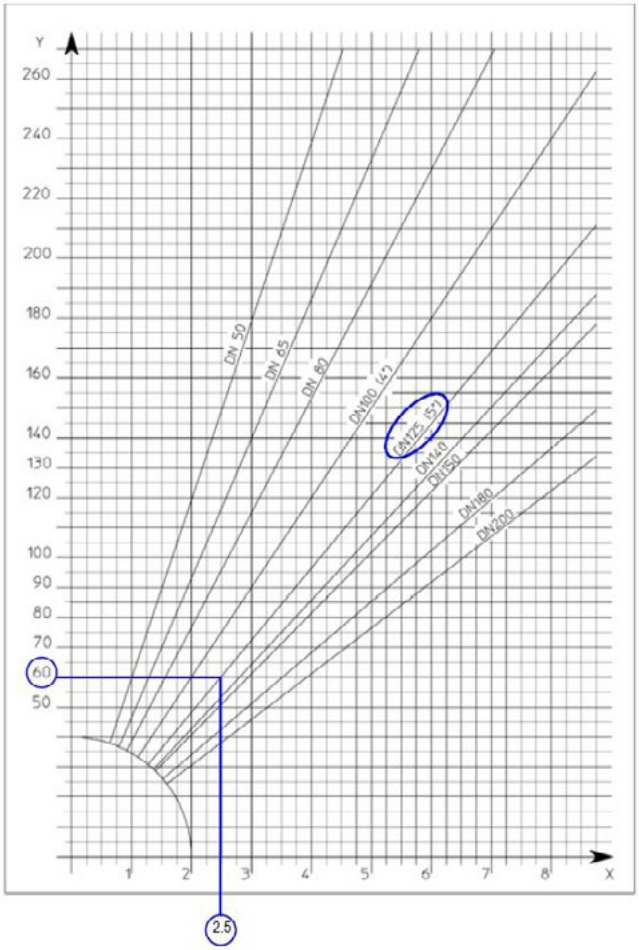
- if the measured thickness is less than the value indicated in the table, replace the worn parts with original spare parts.

X axis = minimum thickness of the walls [mm]
Y axis = working pressures [bar] (*) on concrete
PL = Working pressure
DN = Nominal diameter

Example of reading
PL = 60 [bar] (*)
DN = 125 [mm]

Draw a horizontal line at 70 on the Y-axis until it crosses the DN 125 line.
From the point of intersection, draw a vertical line until it crosses the X-axis which determines the minimum thickness of the pipe = 2.5 [mm].

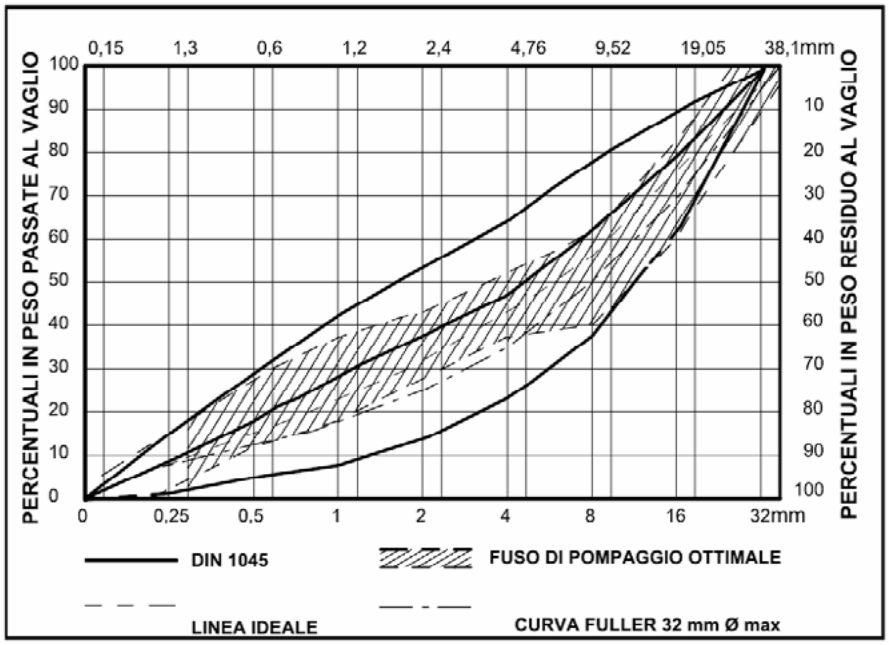
(*) 1 bar = 0.1 MPa



General notes on the different types of concrete in use

The following notes are not intended to provide specific information on concrete, but are intended to provide useful information for recognising and identifying different mixtures.

In order for concrete to be pumped and flow smoothly through the pipes, it must have certain characteristics that guarantee pumpability.



Concrete essentially consists of four elements:

1. cement;
2. sand;
3. aggregates;
4. water.

The composition in relation to cement

Concrete can be divided, in broad terms, into three major categories:

- **RICH CONCRETE**: the cement content is greater than 370 kg/m^3: high pumpability index;
- **MEDIUM CONCRETE**: the cement content is between 300 - 370 kg/m^3: it has a good pumpability index and meets most construction requirements;
- **LEAN CONCRETE**: the cement content is less than 300 kg/m^3; the cheapest type, its pumpability decreases rapidly in relation to the cement content, so more precautions should be taken while casting.

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The function of cement in relation to pumpability

Regardless of its main function, i.e. being a binding element, cement, in terms of pumpability acts as a lubricant, significantly reducing the friction created between the aggregates and the piping.

Low cement contents may have a negative effect on the mechanical strength of the casting, worsening the pumpability of the concrete due to internal friction.

- **Low cement content**: increased friction, poor pumpability and possibility of clogging.
- **Correct cement content**: low friction, excellent pumpability, no clogging.
- **High cement content**: good lubrication, increased viscosity, increased pressure drops.

Having made this initial classification in relation to the cement content in concrete, it is necessary to point out that it is not sufficient to guarantee good pumpability, although it contributes to it.

It is understood that not all cements have the same characteristics, so the effects are not the same.

The cement production method (Portland, Pozzolanic, Blast Furnace) and its classification with respect to grinding (fine, medium and coarse, long and short cements) lead to the need to prefer the Portland type and long cements to short ones.

Portland cement retains water well thanks to its ability to amalgamate with it; other types do not give the same results so the water tends to separate and, as they say in jargon, the concrete “cries”; of course, this effect can make pumping difficult.

The composition in relation to sand

Good sand not only improves the concrete in terms of quality, but also reduces the cost of the concrete by saving cement and, above all, **makes the concrete much more pumpable**.

Of course, the sand must have a good grain size curve (contain the various grain sizes in the right proportions).

For good pumpability, the sand should contain very fine parts, the size of which is below 0.2 mm. Usually, 7-12% in weight is a good content.

Aggregates

Aggregates can be classified into two groups:

1. natural gravel;
2. crushed stone.

Natural gravel

It consists of aggregates with rounded edges, roughly spheroidal in shape due to wear over time in nature. **It is very suitable for pumping** because, thanks to its shape, it creates minimal friction both between the aggregates themselves and between the aggregates and the piping.

A well-proportioned concrete can contain aggregates with a maximum dimension of 1/3 of the pipe diameter.

If the proportion of larger aggregates is 10% or less of the total, the aggregate size can be slightly increased.

Crushed stone

Apart from the difficulty for some construction sites of having natural gravel available, the current trend leads to a preference of crushed aggregate whose origin (rock) is known and whose hardness (strength) is classified according to the type of rock (basaltic, granitic, dolomitic, etc.).

Crushed aggregate leads to **increased wear** for the following reasons:

1. shape of the aggregate;
2. hardness of the aggregate.

When crushed, the aggregate is characterised by sharp edges, which, when in contact with the metal of the pipes, breaks the lubricating film formed by the cement and behaves a bit like a cutting tool that gradually digs into the metal surface.

It is advisable to reduce the maximum pumping speed to increase the service life of the components.

Water

The correct dosage of water is very important and it is usually defined by the water-cement ratio.

For the chemical reaction of cement hydration to take place, a water content of 30 litres per 100 kg of cement is sufficient.

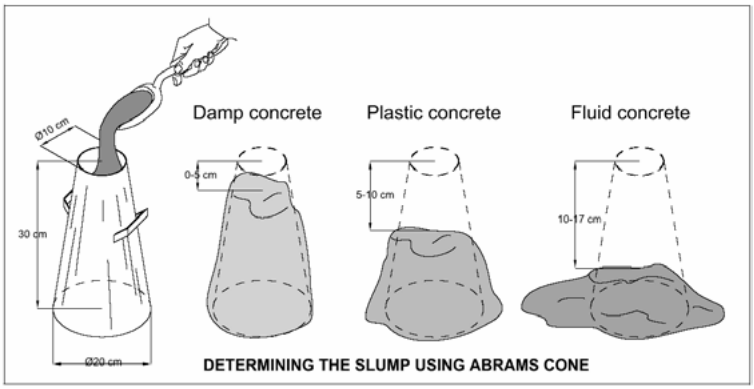
However, in practice, this amount of water is increased due to the need to obtain a sufficiently plastic and therefore workable mixture.

It should be remembered that, in any case, the minimum amount of water compatible with the desired degree of workability must be used, as beyond a water-cement ratio of 0.30, the final strength of the concrete decreases in inverse proportion to this ratio.

Depending on the type in use, this consistency can have a different value.

High consistency

Precast panels, formwork, beams, etc. Casting requires vigorous vibration and the water-cement ratio is about 0.4%; the slump values are around 3-8 cm.



DETERMINING THE SLUMP USING ABRAMS CONE

Low consistency

Roofing slabs, castings with closely spaced reinforcements, etc. Significant vibration is not required; the slump values are usually between 10 and 15 cm.

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5. INSPECTION BOOKLET

MACHINE DELIVERY TO THE FIRST OWNER

The crawler distribution boom type _____

with factory number: _____

and construction year _____

referred to in this check register has been delivered by _____

_____

On _____

to Messrs: _____

_____

according to the terms agreed upon in the contract, with the technical, size and functional characteristics specified in the Operating Handbook.

SUBSEQUENT CHANGES OF OWNERSHIP

On _____

The ownership of the crawler distribution boom mentioned above is transferred to the Firm/Company:

_____

_____

It is hereby certified that on the date mentioned above the technical, dimensional and functional characteristics of this crawler distribution boom are consistent with the originally envisaged ones and that changes, if any, have been reported in this Register.

The Seller	The Buyer
_____	_____

SUBSEQUENT CHANGES OF OWNERSHIP

On _____

The ownership of the crawler distribution boom mentioned above is transferred to the Firm/Company:

_____

_____

It is hereby certified that on the date mentioned above the technical, dimensional and functional characteristics of this crawler distribution boom are consistent with the originally envisaged ones and that changes, if any, have been reported in this Register.

The Seller	The Buyer
_____	_____

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REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE HYDRAULIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF COMPONENTS IN THE ELECTRIC SYSTEM

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

Documentazione senza certificazione CE
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REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF GEARS OR STRUCTURAL COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

REPLACEMENT OF SAFETY DEVICES AND RELEVANT COMPONENTS

On the date _____ the piece _____

fabricated _____

HAS BEEN REPLACED with _____

fabricated _____ factory Nr. _____

note _____

_____

Cause of replacement _____

_____

The officer of the firm entrusted with the replacement The user

_____ _____

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VERIFICATION OF PERIODICAL MAINTENANCE

The user must comply with the maintenance and surveillance obligation described in this operating handbook.

NR.	Date	Description of intervention	SIGNATURE
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Documentation without CE certificate

NR.	Date	Description of intervention	SIGNATURE
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Documentazione senza certificazione CE
Documentation without CE certificate

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

Documentazione senza certificazione CE
Documentation without CE certificate

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

IMPORTANT SAUNDRIES AND THEIR REPAIR

Description of failure _____

_____

_____

Causes _____

_____

_____

Repair carried out _____

_____

_____

Signature of the official of servicing firm _____ User's signature _____

Place _____ Date _____

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IMER International S.p.A.

Registered and administrative office
Via Salceto, 53-55 - 53036 Poggibonsi (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 983304

Operational Headquarters
Equipment division
Via della Meccanica, 39 (Zona Industriale Sentino) - 53040 Rapolano Terme (SI) Italy
Tel. +39 0577 97341 - Fax +39 0577 704047

imergroup.com