Naudojimo Instrukcijos

Originalaus naudojimo instrukcijos vertimas

Klojimo transporteris TRANSMOBIL

TM-150-D-A-XL

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1 EB atitikties deklaracija

Pavadinimas:	Klojimo transporteris TRANSMOBIL
Tipas:	TM-150-D-A-XL
Gaminio Nr.:	5222.0012

Gamintojas:	„Probst GmbH“ Gottlieb-Daimler-Straße 6 71729 Erdmannhausen, Vokietija info@probst-handling.com www.probst-handling.com

Anksčiau minėta mašina atitinka atitinkamus šių ES direktyvų reikalavimus:

2006/42/EB (mašinų direktyva)

2014/30/ES (Elektromagnetinis suderinamumas)

Buvo taikomi šie standartai ir techninės specifikacijos:

DIN EN ISO 12100

Mašinų sauga. Bendrieji projektavimo principai. Rizikos vertinimas ir jos mažinimas (ISO 12100:2010)

DIN EN ISO 13857

Mašinų sauga. Saugūs atstumai, trukdantys viršutinėms ir apatinėms galūnėms pasiekti pavojingas zonas (ISO 13857:2008).

DIN EN 1012-1 / DIN EN 1012-2

Kompresoriai ir vakuuminiai siurbliai. Saugos reikalavimai. 1 ir 2 dalis.

DIN EN 60204-1 (IEC 60204-1)

Mašinų sauga. Pramoninių mašinų elektros įranga. 1 dalis: Bendrieji reikalavimai

Už dokumentų rengimą atsakingas asmuo:

Vardas, pavardė: J. Holderied
Adresas: Probst GmbH; Gottlieb-Daimler-Straße 6; 71729 Erdmannhausen, Vokietija

Parašas, duomenys apie pasirašiusį asmenį:

Erdmannhausen, 06.05.2019.....
(M. Probst, generalinis direktorius)

2 Saugumas

2.1 Saugumo nurodymai

Pavojus gyvybei!
Žymi pavojų. Jei nesisaugosite, galite žūti ar sunkiai susižaloti.

Pavojinga situacija!
Žymi pavojingą situaciją. Jei nesisaugosite, galite susižaloti arba patirti materialinę žalą.

Draudimas!
Žymi draudimą. Jei jo nesilaikysite, galite žūti, sunkiai susižaloti arba patirti materialinę žalą.

Svarbi naudojimo informacija arba naudingi patarimai.

2.2 Sąvokų apibrėžimai

Krovimo zona:	• Nurodo mažiausius ir didžiausius krovinių, kurie gali būti kraunami šiuo prietaisu, matmenis.
Krovinys (kroviniai):	• Yra gaminys, kuris yra kraunamas arba pervežamas.
Atidarymo plotis:	• Yra krovimo zona ir fiksavimo matmuo. *Krovimo zona + fiksavimo matmuo = atidarymo plotis*
Panardinimo gylis:	• Atitinka didžiausią krovinio pakrovimo aukštį, kuris priklauso nuo prietaiso sukabinimo kumštelių aukščio.
Prietaisas:	• Yra krovimo prietaiso apibrėžimas.
Gaminio matmuo:	• Yra krovinio matmenys (pavyzdžiui, gaminio ilgis, plotis, aukštis).
Svoris:	• Yra tuščio prietaiso svoris (be krovinio).
Apkrova (WLL *):	• Nurodo didžiausią leistiną prietaiso apkrovą (keliant krovinį).

*= WLL → *(angliškai:)* Working Load Limit

2.3 Specialistų / kompetetingų asmenų apibrėžimas

Prietaiso instaliacijos, techninės priežiūros ir remonto darbus atlikti gali tik kvalifikuotas arba kompetetingas personalas!

Specialistai arba kompetetingi asmenys privalo turėti šių, su prietaisu susijusių sričių, profesinių žinių:

- mechanikos
- hidraulikos
- pneumatikos
- elektros

2.4 Saugumo ženklinimas

DRAUDŽIAMIEJI ŽENKLAI

Simbolis	Reikšmė	Užsakymo Nr.	Dydis
	Niekada neįjskite po kabančiais kroviniais. **Pavojus gyvybei!**	2904.0210 2904.0209 2904.0204	Ø 30 mm Ø 50 mm Ø 80 mm
	Krovinį prisiurbti galima tik per vidurį.	2904.0383 2904.0594	102 x 52 mm 65 x 33 mm

ĮSPĖJAMIEJI ŽENKLAI

Simbolis	Reikšmė	Užsakymo Nr.	Dydis
	Rankų prispaudimo pavojus.	2904.0221 2904.0220 2904.0107	30 x 30 mm 50 x 50 mm 80 x 80 mm

ĮPAREIGOJAMIEJI ŽENKLAI

Simbolis	Reikšmė	Užsakymo Nr.	Dydis
	Visi operatoriai privalo būti perskaitę ir supratę prietaiso naudojimo instrukciją su saugos taisyklėmis.	2904.0665 2904.0666	Ø 30 mm Ø 50 mm
	Naudokite klausos apsaugos priemones	2904.0298	Ø 50 mm
	Filtro įdėklą kasdien išpūskite suslėgtuoju oru. Filtro neištraukite! Jei labai nešvarus, pakeiskite!	2904.0687	Ø 50 mm
	Pilkite tik dyzeliną – biodyzelino negalima!	2904.0483	16 x 130 mm

NURODYMAI DĖL NAUDOJIMO			
Simbolis	**Reikšmė**	**Užsakymo Nr.**	**Dydis**
	Pirmenybė teikiama tai didžiausiai leistinai vardinei apkrovai, kuri nurodyta ant vakuuminio perkėlimo įtaiso identifikacinės lentelės!	2904.0730	48 x 125 mm
	Vakuuminio ir važiavimo režimo funkcinė svirtis	2904.0478	185 x 30 mm
	Atraminio strypo lygiavimo vairasvirtė	2904.0477	50 x 50 mm
	Apribokite lankstomos gervės sukimo diapazoną dirbdami prie pat kelių (SAFESTOP) – nelaimingų atsitikimų su transporto priemonėmis **PAVOJUS**	2904.0682	100 x 132 mm
	Didžiausio leistino krovinio, atsižvelgiant į atsvarą ir siekį, nuoroda	2904.0731	95 x 75 mm
	Tvirtinimo kilpa perkėlimo mašinai apsaugoti naudojant grandines arba tempimo diržus gabenimo transporto priemonėje	2904.0755	Ø 60 mm

2.5 Asmens apsaugos priemonės

- Visi operatoriai privalo būti perskaitę ir supratę prietaiso naudojimo instrukciją su saugos taisyklėmis.
- Prietaisą ir visus valdančiuosius prietaisus, į kuriuos prietaisas yra įdėtas, gali eksploatuoti tik įgalioti ir kvalifikuoti asmenys.

- Rankomis gali būti valdomi tik prietaisai su rankenomis.

2.6 Apsauginė įranga

Pagal techninius saugos reikalavimus apsauginę įrangą sudaro:

- apsauginiai drabužiai
- apsauginės pirštinės
- apsauginiai batai

- Klausos apsaugai

2.7 Apsauga nuo nelaimingų atsitikimų

- Plačiai nuo neįgaliotų asmenų, ypač vaikų, apsaugokite darbo zoną.
- Būkite atsargūs per audrą!

- Pakankamai apšvieskite darbo zoną.
- Būkite atsargūs, jei statybinės medžiagos yra šlapios, prišalusios arba purvinos.

- Sudėtingomis oro sąlygomis, kai temperatūra yra žemesnė kaip 3 °C (37,5 °F), dirbti su prietaisu draudžiama.
  Drėgmės ir apledėjimo atveju kyla pavojus, kad imamos prekės nuslys.

2.8 Funkcijų ir vizualinis patikrinimas

2.8.1 Elektros įranga

- Kiekvieną kartą prieš darbą būtina patikrinti, ar elektros laidai sujungti tinkamai.
- Sugedusias elektros įrangos dalis **atjungus nuo maitinimo** turi pakeisti **specialistai**.
- Hidraulinių jungčių žarnose negali būti pratrintų vietų ir atliekant keliamuosius, reikia stebėti, kad atliekant nuleidžiamuosius judesius jos neužkibtų už išsikišusių kraštų ir nenutrūktų.

2.8.2 Bendroji informacija

- Kiekvieną kartą prieš naudojant reikia patikrinti, ar prietaisas veikia ir kokia yra jo būklė.
- Atlikti techninę priežiūrą, tepti ir šalinti sutrikimus galima tik prietaisą išjungus!

- Jei yra trūkumų, susijusių su saugumu, prietaisą vėl galima eksploatuoti tik visiškai pašalinus trūkumus.
- Jei yra bet kokios rūšies įtrūkimų, įskilimų ar sugedusių dalių bet kokioje prietaiso vietoje, būtina **nedelsiant** liautis prietaisą naudoti.

- Prietaiso naudojimo instrukciją naudojimo vietoje turi būti galima pasiskaityti bet kokiu metu.
- Prie prietaiso pritvirtintos prietaiso duomenų plokštelės nuimti negalima.
- Neįskaitomas įspėjamąsias iškabas (pvz., draudžiamuosius ir įspėjamuosius ženklus) būtina pakeisti.

2.9 Sauga eksploatavimo metu

Netinkamai tvarkant krovinius galimas sužalojimas!

- **Krovinių niekada netraukite ir nevilkite skersai**
- **Užfiksuotų krovinių niekada nepaleiskite su prietaisu**
- **Krovinius visada imkite tik per vidurį**

Valdyti rankomis leidžiama tik prietaisus su rankenomis.

Operatorius negali išeiti iš valdymo vietos, kol vyksta prietaiso krovimo procesas, kurį jis turi nuolat stebėti.

Krovinį atlaisvinkite tik tada, kai jis visiškai ir saugiai padėtas ant grindų.
Rankas ir pėdas laikykite atokiai nuo krovinio! Sutraiškymo pavojus!

Operatorius turi nuolat stebėti manometrą.
Krovinį kelkite tik tada, kai pasiektas reikalingas vakuuminis neigiamasis slėgis.
Jeigu manometro rodyklė pereina į raudoną zoną, krovinį nedelsdami padėkite!
Jeigu darbinis slėgis nukrinta žemiau reikalingo slėgio, krovinį nedelsdami padėkite!
Pavojus gyvybei! Krovinys nukris!

3 Bendroji informacija

3.1 Naudojimas pagal paskirtį

Įrenginys TRANSMOBIL – tai mobilus transportavimo ir klojimo įrenginys, skirtas visam statybinių medžiagų padėklui transportuoti, taip pat kelti ir tiesti betoniniams elementams, natūraliems akmenims, plokštėms ir pan., naudojant atitinkamus vakuuminio perkėlimo įtaisus ant vakuuminio vamzdinio keltuvo.

Kad būtų galima išnaudoti kuo didesnę darbinę zoną, klojimo darbus reikėtų vykdyti įrenginio dešinėje pusėje.

Dėl dyzelinio variklio naudoti įrenginį uždarose patalpose arba zonose, kuriose gresia sprogimas arba gaisras, draudžiama!

Prietaiso standartinėje komplektacijoje yra šie elementai:

- Vakuuminis kėlimo įrenginys, su standartiniu 150 kg keliamosios jėgos vakuuminiu perkėlimo įtaisu
- Vakuuminio klojimo įrenginio atraminis strypas ištiesiamas vertikaliai, kad būtų paprasta nustatyti klojamų produktų padėtį nelygiame reljefe.
- Lankstoma gervė su SAFESTOP. Lankstomos gervės sukiojimo diapazoną galima užblokuoti. Taip klojant, pvz., šaligatvio bortelius keliuose, sukiojimo diapazoną į važiuojamosios kelio dalies pusę galima užblokuoti.
- Kompaktiška transportavimo padėtis. Gervę gali nulenkti greitai ir patikimai.
- Valandų skaitiklis ir raktinis jungiklis
- Įrankių laikymo dėžė
- Plokščių kėlimo įrenginys su dviem šakių dantimis
- elektroninis, visiškai automatinis atraminio strypo lygiavimas

- Prietaisą galima naudoti tik naudojimo instrukcijoje nurodytiems tikslams, laikantis galiojančių saugumo nuostatų ir atitinkamų įstatymų bei atitikties deklaracijos nuostatų.
- Bet koks kitas naudojimas laikomas naudojimu ne pagal paskirtį ir yra **draudžiamas**!
- Taip pat būtina laikytis naudojimo vietoje galiojančių saugumo ir nelaimingų įvykių prevencijos nuostatų.

Naudotojas prieš kiekvieną naudojimą **privalo** įsitikinti, kad:

- Prietaisas yra tinkamas numatytai naudojimo paskirčiai
- Prietaisas yra nepriekaištingos būklės
- Keliamus krovinius galima kelti

Esant abejonių, prieš pradėdami eksploatuoti susisiekite su gamintoju.

DĖMESIO: Dirbti su šiuo prietaisu leidžiama tik pažemėje (➔skyrius „Eksploatavimo sauga“)!

- Krovinys (akmens plokštė), kuris buvo prisiurbtas ir turi būti transportuojamas, pats turi būti stabilus, kitaip jis **gali sulūžti**!
- Keliamos akmens plokštės **jokiu būdu** neturi sulinkti – į tai ypač svarbu atkreipti dėmesį, kai keliamos plonos ir didelio ploto plokštės.
- Iš esmės krovinius (akmens plokštes) galima prisiurbti tik **per vidurį**, kitaip krovinys ant prietaiso kybos kreivai, dėl to krovinys gali lūžti – ypač nedideliais vakuuminiais perkėlimo įtaisais keliant didelio formato akmens plokštes.
- Standartiniai vakuuminiai perkėlimo įtaisai netinka stiklui transportuoti!

Galima naudoti **tik** gamintojo **Probst** vakuuminius perkėlimo įtaisus!

Keli vakuuminiai perkėlimo įtaisai, kurie sumontuoti ant prietaiso, mažina jo vardinę apkrovą.

Ant kiekvieno vakuuminio perkėlimo įtaiso nurodyta leistina jo vardinė apkrova.

Galima naudoti **tik** tam prietaisui **leistinus** vakuuminius perkėlimo įtaisus!

Viršyti leistiną ir nurodytą vakuuminio perkėlimo įtaiso vardinę apkrovą **griežtai draudžiama!**

Pavojus: krintantis krovinys!

Draudžiama naudoti vakuuminio perkėlimo įtaisą, kurio vardinė apkrova mažesnė negu kėlimo įrenginio ir valdymo bloko!
Pavojus! Krintantis krovinys!
(Leidžiama naudoti vakuuminio perkėlimo įtaisą, kurio vardinė apkrova didesnė negu kėlimo įrenginio ir valdymo bloko.)

3.2 Apžvalga ir struktūra

1. Vikšrinis vežimėlis
2. Pavara (dyzelinio variklio)
3. Valdymo blokas
4. Vakuumo tiekimas
5. Atraminis strypas
6. Lankstoma gervė
7. Vakuumo tiekimo žarna
8. Kėlimo įrenginys
9. Vakuuminis valdymo blokas
10. Šakių dantis (plokščių kėlimo įrenginio)
11. Vakuuminio valdymo bloko stovėjimo padėtis

3.3 Techniniai duomenys

Tipas	Pavara	maks. siekis (mm)	Vakuuminio kėlimo įrenginio keliamoji jėga [1] (kg)	Naudingoji apkrova [2] (kg)	Natūrinis svoris (kg)
TM-150-D-A-XL **TM-150-D-A-SILENT-XL**	Dyzelinis variklis 9,6 kW	3000	150	1500[2]	~ 1540

Plotis (mm)	Aukštis transportavimo padėtyje (mm)	Ilgis transportavimo padėtyje (mm)	Maks. važiavimo greitis (km/h)
1910	2290	2300	~ 2,2

Šakių dantis	Naudingasis ilgis (mm)	Kėlimo aukštis (mm)	Keliamoji jėga [2] (kg)
	1090	340	1500[2]

1 Naudojant stipresnį kėlimo įrenginį, atitinkamą vakuuminio perkėlimo įtaisą ir atsvaro aikštelę TM-GGP, keliamoji jėga gali būti padidinta iki 200 kg esant visam siekiui ir iki 250 kg esant 500 mm mažesniam siekiui.

2 Didžiausia leistina naudingoji apkrova (šakių dantų keliamoji apkrova), skirta vienam visam statybinių medžiagų padėklui transportuoti, yra 1500 kg.

Vikšrinio transporterio didžiausią leistiną naudingąją apkrovą **1500 kg** sumažina pritvirtintų vakuuminių komponentų natūrinis svoris.

4 Valdymas

4.1 Pavaros paleidimas

Kad naudotojas ir mašina būtų apsaugoti nuo sužalojimų ir pažeidimų, prieš pradedant eksploataciją būtina gerai suprasti visas saugos nuorodas ir (arba) piktogramas bei jų laikytis.

Vadovaukitės pridedamomis dyzelinio variklio („Hatz“) ir vikšrinio krautuvo (HINOWA) naudojimo instrukcijomis!

Kiekvieną kartą prieš pradedant darbą reikia patikrinti įrenginio alyvos pripildymo lygį ir, jeigu reikia, papildyti alyvos (A ir B pav.).

Žr. ir kitus techninės priežiūros nurodymus, pateiktus dyzelinio variklio (HATZ) ir vikšrinio krautuvo (HINOWA) naudojimo instrukcijose.

A pav.

B pav.

Alyvą tikrinkite kiekvieną dieną, ištraukdami alyvos matuoklį.

Kiekvieną dieną tikrinkite oro filtro užterštumą, jeigu reikia, išvalykite jį.

C pav.

D pav.

1. Atidarykite dangtį. (1 pav.)
2. Įjunkite pagrindinį jungiklį (nustatykite į vertikalią padėtį (2 pav.)

Prieš paleidžiant dyzelinį variklį, I valdymo bloke atrankųjį perjungiklį **reikia** nustatyti į padėtį „Hand“ (rankinis režimas) (ir palikti šioje padėtyje) (3 pav.).

1 pav.

2 pav.

3 pav.

3. Variklio paleidimas. Jungiklį nustatykite į padėtį ON (↘), įkiškite paleidimo raktą ir pasukite (↙) (4 pav.)
4. Variklio sūkių skaičiaus reguliavimas (↖ ↘). (5 pav.)

4 pav.

5 pav.

4.2 Važiavimas vežimėliu

1. Susipažinkite su vežimėlio valdymo svirtimis. Informaciją žr. pridedamoje naudojimo instrukcijoje („Hinowa“) (1 pav.).

1 pav.

2. Norėdami važiuoti įrenginiu, įjunkite atitinkamą paženklintą valdymo svirtį, žr. lipduką su simboliu (2 pav.).

2 pav.

3. Nulenkite vairuotojo laiptelį (3 pav.)

3 pav.

4. Važiuodamas naudotojas atsistoja ant laiptelio (4 pav.)

4 pav.

Kiekvieną kartą važiuojant įrenginiu vakuuminį vamzdinį keltuvą reikia būtinai apsaugoti nuo sukimosi (5 pav.).
Pavojus susižeisti!

Spyruoklinis blokavimo įtaisas (↖) turi būti užfiksuotas, kad vakuuminis vamzdinis keltuvas neišslystų iš laikiklio (6 pav.).

5 pav.

6 pav.

4.3 Gervės montavimas

Prieš paleidžiant dyzelinį variklį, I valdymo bloke atrankųjį perjungiklį **reikia** nustatyti į padėtį „Hand“ (rankinis režimas) (ir palikti šioje padėtyje).

1. Norėdami sulygiuoti gervės svirtį, paleiskite variklį (žr. skyrių „Pavaros paleidimas“). (1, 1A pav.)

1 pav.

(1A pav.)

2. Norėdami sulygiuoti gervės svirtį, vairasvirtę paspauskite atgal (operatoriaus kryptimi). (2, 2A pav.)
3. **Alternatyva**: naudoti automatinį režimą. Jeigu atrankusis perjungiklis nustatytas į padėtį „Auto“ (automatinis režimas), gervės svirtis „automatiškai“ juda į viršų. (3 pav.)

Čia būtina atkreipti dėmesį, kad pavojingoje zonoje nieko nebūtų. **Pavojus susižeisti!**

Norėdami sustabdyti automatinį režimą, vėl nustatykite atrankųjį perjungiklį į padėtį „Hand“ (rankinis režimas).

2 pav.

(2A pav.)

3 pav.

4. Pirma sulygiuokite gervės svirtį maždaug 45 laipsnių kampu. (4 pav.)
   Norėdami sustabdyti, atrankųjį perjungiklį vėl nustatykite į padėtį **Hand** (rankinis režimas).

4 pav.

5. Leisti užfiksuoti gervės svirtį. Šiuo tikslu lyną patraukite žemyn (5 pav.).

5 pav.

6. Gervės svirtį atlenkite iki galo (6 pav.), kol priekinė ir galinė gervės svirties dalys sudarys vieną liniją.

6 pav.

7. Užblokuokite gervę fiksuotoje padėtyje, kad atliekant likusius montavimo darbus ji nejudėtų. Šiuo tikslu lyną patraukite žemyn (7 pav.)

7 pav.

8. Kėlimo žarna tvirtinimo guma pritvirtinta ant važinėjančio gervės kablio, kad nesisukiotų. Atskirkite kėlimo žarną nuo šio tvirtinimo elemento ir padėkite ant žemės (8 pav.).

8 pav.

9. Kėlimo įrenginį pakabinkite ant važinėjančio gervės kablio (9 pav.)

9 pav.

10. Kėlimo žarną užmaukite ant sujungimo detalės (kėlimo įrenginio) (10 pav.)

10 pav.

11. Uždarykite spaustukus (11 pav.).

DĖMESIO: pavojus susižaloti rankas!

11 pav.

12. Gervės svirtį sulygiuokite 90° kampu iki galo. Šiuo tikslu atrankųjį perjungiklį vėl nustatykite į padėtį **Hand** (rankinis režimas), o vairasvirtę, norėdami sulygiuoti gervės svirtį, paspauskite iki galo atgal (operatoriaus kryptimi). (12, 12A pav.)
13. **Alternatyva**: naudoti automatinį režimą. Jeigu atrankusis perjungiklis nustatytas į padėtį „Auto“ (automatinis režimas), gervės svirtis „automatiškai“ juda į viršų. (13 pav.)

Čia būtina atkreipti dėmesį, kad pavojingoje zonoje nieko nebūtų. **Pavojus susižeisti!**

Norėdami sustabdyti automatinį režimą, vėl nustatykite atrankųjį perjungiklį į padėtį „Hand“ (rankinis režimas).

12 pav.

12A pav.

13 pav.

4.4 Atraminio strypo lygiavimas

Kiekvieną kartą prieš pradedant darbą reikia pritaikyti įrenginį prie reljefo, ant kurio jis naudojamas, polinkio. Tai atliekama sulygiuojant atraminį strypą.

1. Šiuo tikslu atrankųjį perjungiklį vėl nustatykite į padėtį **Hand** (rankinis režimas) ir judinkite vairasvirtę į dešinę, kairę arba pirmyn ar atgal. (1 pav.)
2. Matuoklis, esantis ant viršutinio atraminio strypo galo, nurodo reljefo polinkį (2 pav.).
3. Alternatyva: naudoti automatinį režimą. Jeigu atrankusis perjungiklis nustatytas į padėtį „Auto“ (automatinis režimas), atraminis strypas nuolat automatiškai prisitaiko prie reljefo polinkio (3 pav.).

1 pav.

2 pav.

3 pav.

4. Sujunkite valdymo bloką su vakuuminio perkėlimo įtaisu. Įkabinkite abu valdymo įtaiso spaustukus į vakuuminio perkėlimo įtaiso pakabinimo kablius. (4 pav.)
5. Uždarykite abu valdymo bloko spaustukus (nulenkite juos žemyn) – taip vakuuminio perkėlimo įtaisas tvirtai sujungiamas su valdymo įtaisu. (5 pav.)

4 pav.

5 pav.

4.5 Kėlimo įrenginys

1. Norėdami dirbti su vakuuminiu vamzdiniu kėlimo įrenginiu, įjunkite atitinkamą paženklintą valdymo svirtį, žr. lipduką su simboliu (1 pav.).

1 pav.

2. Atidarykite abu spyruoklinius blokavimo įtaisus, esančius ant vakuuminio kėlimo įrenginio laikiklio (➘). (2 pav.)

2 pav.

3. Iš lėto išimkite vakuuminį kėlimo įrenginį iš laikiklio. (3 pav.) **Pavojus susižeisti!**

3 pav.

4. Sureguliuokite variklio sūkių skaičių (4 pav.)

4 pav.

5. Variklio sūkių skaičių nustatykite taip, kad manometras vakuuminiame valdymo bloke rodytų bent -0,42 bar, kai tik krovinys prisiurbiamas (5 pav.)

5 pav.

6. Atidarykite abu karabininius kablius (nuo kėlimo žarnos korseto) (6 pav.) ir pakabinkite aukščiau ant kėlimo žarnos korseto (7 pav.).

6 pav.

7. Dabar kėlimo žarna galima dirbti

7 pav.

4.6 Valdymo bloko

4.6.1 Levitacijos būsenos be krovinio nustatymas

Levitacijos būseną be krovinio reikia nustatyti prieš pradedant eksploataciją.

Kėlimo įrenginio levitacijos būseną reikia pritaikyti prie atitinkamo griebtuvo svorio. Tam skirta sklendė, esanti valdymo bloke

Galima keisti sklendės (2) padėtį

Kai uždedate siurbiamąjį griebtuvą ant krovinio, sklendė stūmikliu atidaroma iki galo. Taip krovinį galima prisiurbti ir pakelti.

Eiga:

- pasukite reguliavimo varžtą (1) ant valdymo bloko (pasiekiamas iš apačios)
  - Sukant pagal laikrodžio rodyklę ➔ sklendė atidaroma labiau
  - Sukant prieš laikrodžio rodyklę ➔ sklendė uždaroma
- Kuo daugiau atidaryta sklendė, tuo mažiau linguoja įrenginys

Jeigu sklendė uždaryta iki galo, įrenginys greitai kylą aukštyn, kai tik įjungiama orpūtė!

- Padėkite valdymo bloką ant krovinio per vidurį ir reguliavimo svirtį (1) paspauskite žemyn. Kėlimo įrenginys atsipalaiduoja ir valdymo blokas nusileidžia.
- Uždėkite valdymo bloką ant krovinio / šaligatvio bortelio per vidurį.
- Iš lėto spauskite valdymo bloko reguliavimo svirtį į viršų. Krovinys prisiurbiamas ir kėlimo įrenginys susitraukia.

Valdymo svirtį padėtyje „Siurbti / kelti“ palikti galima ilgiausiai 90 sekundžių, kitaip orpūtė gali būti pažeista ir gali sugesti (garantija šiuo atveju negalioja), taip pat be reikalo eikvojama energija.

4.6.2 Levitacijos būsenos su kroviniu nustatymas

Reguliavimo varžtu (2) nustatoma levitacijos būsena su kroviniu – atsargiai, nesupainiokite su levitacijos būsena be krovinio.

- Sukant pagal laikrodžio rodyklę ➔ levitacijos būsena mažėja
- Sukant prieš laikrodžio rodyklę ➔ levitacijos būsena didėja

Valdymo svirtį padėtyje „Siurbti / kelti“ palikti galima ilgiausiai 90 sekundžių, kitaip orpūtė gali būti pažeista ir gali sugesti (garantija šiuo atveju negalioja), taip pat be reikalo eikvojama energija.

Levitacijos būsena su kroviniu neturi būti aukščiausioje kėlimo nustatymo vietoje, kitaip esant prisiurbtam kroviniui orpūtė gali būti pažeista ir gali sugesti (garantija šiuo atveju negalioja), taip pat be reikalo eikvojama energija.

- Krovinį / šaligatvio bortelį atsargiai transportuokite į paskirties vietą ir padėkite norima padėtimi, šiuo tikslu iš lėto žemyn nuspauskite reguliavimo svirtį (1). Kėlimo įrenginys atsipalaiduoja ir valdymo blokas su kroviniu nusileidžia.
- Nespauskite reguliavimo svirties į apačią staigiai ir vienu metu nelaikykite valdymo apkabos (3). Kitaip krovinys gali staigiai nukristi, nes vakuumas visiškai pradingsta.
- Padėkite krovinį (šaligatvio bortelį), valdymo bloką kiek paverskite ir atlaisvinkite nuo krovinio / šaligatvio bortelio.

Daugiau informacijos pateikta pridedamoje valdymo bloko / kėlimo įrenginio naudojimo instrukcijoje.

A pav.

B pav.

C pav.

4.7 Vožtuvo sklandžio nustatymas

Vožtuvo sklandis, esantis vakuuminio perkėlimo įtaiso viršutinėje pusėje (valdymo bloko montavimo pusė) gamykloje nustatytas ties 63 mm ir pritvirtinamas antveržle.

Šio atstumo jokiu būdu negalima keisti, kitaip prisiurbtas akmuo gali nukristi. Nelaimingo atsitikimo pavojus!

Sumontuotu vožtuvo sklandžiu sklendė (2), skirta nustatyti levitacijos būsenai be krovinio, uždėjus vakuuminį perkėlimo įtaisą ant krovinio yra iki galo atidaroma.

Taip prisiurbimo procesas tampa žymiai lengvesnis. Be to, taip dar padidinamas saugumas keliant porėtas medžiagas arba krovinį imant ne už svorio centro.

Jeigu labai dulkėtų, nešvarių šaligatvio bortelių / plokščių ir pan. atveju vožtuvo sklandis dažnai strigtų, išimties atvejais galima dirbti ir be vožtuvo sklandžio.

Būtina tam sąlyga – labai orui nelaidžios medžiagos. Bet tai naudotojas turi išbandyti kiekvienu atskiru atveju.

Abejojant **VISADA** reikia dirbti **su vožtuvo sklandžiu** ir jį **dažniau valyti**.

- Sugedus varikliui krovinys nenukrinta (atbulinis vožtuvas)
- Likutinis vakuumas valdymo bloką / kėlimo įrenginį su prisiurbtu kroviniu iš lėto nuleidžia
- Variklio sūkių skaičių nustatykite taip, kad būtų pasiektas mažiausiai -0,42 bar vakuumas

Nenutraukite įstrigusių krovinių!

Tuo metu, kai prisiurbtas krovinys, nenutraukite darbo (nedarykite pertraukų), kyla vakuuminės orpūtės perkaitimo pavojus!

4.8 Sukimosi diapazonas

Nelaimingo atsitikimo pavojus!

Dirbant prie pat važiuojamųjų kelio dalių, gresia nelaimingo atsitikimo pavojus gervei pasisukus į važiuojamosios kelio dalies zoną. Gervė gali pažeisti pravažiuojančias transporto priemones!

Dirbant prie pat važiuojamosios kelio dalies sukimosi diapazoną reikia apriboti, kad gervė negalėtų pasisukti į važiuojamąją kelio dalį.

Tam naudojamas pridedamas kaištis.

Norėdami apriboti sukimosi diapazoną, gervės padėtį nustatykite taip, kad galinė padėtis būtų kairėje nuo vidurio (žr. pav.).

Baigdami įkiškite kaištį.

Dabar gervė gali suktis tik į dešinę (važiavimo kryptimi).

4.9 Gervės fiksavimas

Pavojus susižeisti!

Operatoriaus nevaldoma gervė gali automatiškai suktis ir sugriebti sukimosi zonoje esančius žmones!

Kai tik baigiami darbai su vakuuminiu kėlimo įrenginiu, gervę reikia užfiksuoti! Taip gervės sukimuisi apie abi ašis užkertamas kelias.

- Norėdami užfiksuoti gervę, traukite kairjjį lyną (žr. pav.), kol kaištis dantratyje užsifiksuos.
- Traukle vienu metu užfiksuojamos abi gervės ašys.
- Norėdami fiksavimą pašalinti, patraukite už dešiniojo lyno.

4.10 Krovinių tvarkymas

1. Uždėkite vakuuminį perkėlimo įtaisą ant krovinio
2. Sumontuokite vakuumo įtaisą ir valdymo svirtis
3. Pakelkite krovinį, kai tik susidaro reikalingas vakuumas
4. Krovinį nugabenkite į padėjimo vietą
5. Padėkite krovinį
6. Atlaisvinkite krovinį valdymo svirtimi
7. Galima transportuoti kitą krovinį

4.11 Vakuuminio perkėlimo įtaiso pažeidimai

Pavojus susižeisti!
Krintančio krovinio keliamas pavojus dėl pažeisto guminio sandariklio!

Kad būtų išvengta guminio sandariklio ant vakuuminio perkėlimo įtaiso pažeidimo (įtrūkimai, nusitrynusi medžiaga), reikia atsižvelgti į šiuos dalykus:

- naudojimo metu būtina atkreipti dėmesį, kad vakuuminis perkėlimo įtaisas keliant, padedant arba transportuojant krovinius nebrauktų per kitus daiktus ir į juos nesitrankytų.

4.12 Darbo pabaiga

Kiekvieną kartą baigę darbą akumuliatoriaus pagrindinį jungiklį nustatykite į padėtį OFF (IŠJ.).

- Taip variklio negalės paleisti leidimo tam neturintys asmenys (apsauga nuo vagysčių)
- Įrenginys patikimai atskiriamas nuo srovės

1. Atidarykite dangtį
2. Nustatykite akumuliatoriaus pagrindinį jungiklį į horizontalią padėtį (žr. pav.)
3. Vėl uždarykite dangtį

Rekomenduojama dyzelino baką vakare iki galo pripildyti. Priešingu atveju kitą dieną gali kilti sunkumų užvedant (susidaro daug dūmų) dėl kondensato, kuris dėl temperatūros svyravimų (per naktį) gali susidaryti dyzelino bake.

5 Transportavimas

Įrenginį galima vežti lengvosios transporto priemonės priekaba.
Būtina atsižvelgti į įrenginio matmenis ir leistiną bendrąjį svorį!

Griežtai draudžiama transportuoti įrenginį su pakelta strėlės svirtimi (žr. pav.)

Nelaimingo atsitikimo pavojus!

Transportuojama strėlės svirtis turi būti iki galo sulenkta ir apačioje įdėta į laikiklį (žr. pav.)

Transportuojant vakuuminis kėlimo įrenginys ir tiekimo žarna turi būti nuo įrenginio atskirti. (žr. pav.)

Nelaimingo atsitikimo pavojus!

Tiekimo žarna pritvirtinta tvirtinimo guma ant važinėjančio gervės kablio, kad nesisukiotų.

Norėdami perkelti įrenginį į lengvosios transporto priemonės priekabą arba ant platformos, sujunkite įrenginį pakabinimo ąsomis (A) (žr. viršuje) su keliamuoju įrenginiu (pvz., draga).

Prieš transportavimą lengvosios transporto priemonės priekaboje arba ant platformos, įrenginį reikia tinkamai pritvirtinti, kad neslystų!

Tvirtindami įrenginį lengvosios transporto priemonės priekaboje arba ant platformos, naudokite abi įrenginio **pakabinimo ąsas** (A ir B, žr. pav.).

Toliau rekomenduojama įrenginį diržu pritvirtinti prie pakrovimo paviršiaus skersai abiejų vikšrų.

6 Techninė ir kasdienė priežiūra

6.1 Techninė priežiūra

Siekiant užtikrinti nepriekaištingą veikimą, saugų eksploatavimą ir ilgą prietaiso veikimą, būtina nurodytu laiku atlikti lentelėje apačioje nurodytus techninės priežiūros darbus.

Turi būti naudojamos **tik originalios atsarginės dalys**, kitaip garantija prarandama.

Visus darbus galima atlikti tik išjungus prietaisą!

Atliekant visus darbus būtina užtikrinti, kad prietaisas neužsidarys.

Pavojus susižeisti!

6.1.1 Mechanika

TECHNINĖS PRIEŽIŪROS TERMINAS	Atliktini darbai
Pirmasis patikrinimas po 25 eksploatavimo valandų	• Patikrinkite ir priveržkite visus tvirtinimo varžtus (tai turi atlikti kompetetingas asmuo).
Kas 50 eksploatavimo valandų	• Priveržkite visus tvirtinimo varžtus (atkreipkite dėmesį, kad varžtai būtų veržiami laikantis atitinkamų tvirtinimo klasių veržimo sukimo momentų). • Patikrinkite, ar visi esami apsauginiai elementai (pvz., sulenkiamas pleištas) veikia nepriekaištingai, ir sugedusius apsauginius elementus pakeiskite.→ **1)** • Patikrinkite, ar nepriekaištingai veikia lankstai, kreipiamosios, kaiščiai ir krumpliaračiai, jei reikia, pareguliuokite ir pakeiskite. • Patikrinkite, ar nenusidėvėjusios paėmimo movos, nuvalykite jas ir, jei reikia, pakeiskite. • Prietaisui esant atidarytam mentele sutepkite viršutinę ir apatinę slydimo guolių įtaiso (jei jis yra) pusę. • Visus tepimo antgalius (jei yra) sutepkite tepalo purkštuvu.
Bent 1 kartą per metus **(jei naudojimo sąlygos sudėtingos, tikrinimo intervalą sutrumpinkite)**	• Visų pakabinimo elementų, taip pat kaiščių ir antdėklų patikrinimas. Kompetetingo asmens atliekamas patikrinimas, ar nėra įtrūkimų, nusidėvėjimo, korozijos ir ar veikia saugiai.

1)

6.1.2 Konkretaus įrenginio techninė priežiūra

Techninės priežiūros terminas	Atliktini darbai
Kasdieniai patikrinimai	Žr. pridedamą dyzelinio variklio „HATZ– 1D81C“ ir vikšrinio krautuvo „HINOWA TP2000“ naudojimo instrukcijas. • Vikšrinio krautuvo alyvos pripildymo lygio patikra (žr. HINOWA naudojimo instrukcijas) • Dyzelinės pavaros alyvos pripildymo lygio patikra (žr. HATZ naudojimo instrukcijas)

- Išimkite vakuuminį oro filtrą ir išvalykite (suslėgtu oru), jeigu reikia, pakeiskite.

- Patikrinkite oro filtro dangtelio guminį sandariklį ir, jeigu jis pažeistas, pakeiskite.

- Nuimkite dangtį ir sutepkite tepalų pistoletu.

- Patikrinkite oro filtro užterštumą

6.2 Gedimų šalinimas

Gedimas	Priežastis	Šalinimas
atraminio strypo nepavyksta sulygiuoti	hidraulinė sistema nesandari	priveržkite jungtis ir varžtines jungtis
	hidrauliniai cilindrai neišlaiko slėgio	pakeiskite cilindrų sandarinimo komplektus
	vožtuvo veikimas sutriko	patikrinkite ir išvalykite vožtuvą, jeigu reikia, jį pakeiskite
	polinkio jutiklio laidas sugedęs arba neprijungtas	pakeiskite laidą arba prijunkite jį tinkamai
gervė sukasi netinkama kryptimi	netinkamai nustatyta sukimosi zona	tinkamai nustatykite sukimosi zoną
nepasiekiamas –0,42 bar neigiamasis slėgis	ruošinys turi įtrūkių, iškyšų arba yra porėtas	šis ruošinys netinkamas prisiurbti šiuo įrenginiu
	vakuuminio perkėlimo įtaiso sandarinimo kraštas pažeistas	pakeiskite sandarinimo kraštą
	manometras sugedęs	pakeiskite manometrą
	žarna, varžtinės jungtys nesandarios	pakeiskite komponentus
nėra vakuumo / prietaisas neveikia	sandarinimo guma	patikrinkite sandarinimo gumą apie vakuuminį perkėlimo įtaisą
		jeigu reikia, išvalykite sandarinimo gumą krašto zonoje; išvalykite griovelį
		neklijuokite sandarinimo gumos ant vakuuminio perkėlimo įtaiso
	patikrinkite jungtį	patikrinkite vakuuminės žarnos ir vakuuminio perkėlimo įtaiso jungtį, jungtis turi būti tvirtai priveržta
	oro filtras	patikrinkite oro filtrą, žarnos apkabas ir pan. ir įsitikinkite, kad viskas pritvirtinta tinkamai
	laidai	patikrinkite visus vakuuminio siurblio laidus, ar jie nepažeisti
		patikrinkite, ar laidai nesitrina į korpusą
	pašaliniai daiktai	patikrinkite, ar vakuuminiame siurblyje yra neigiamasis slėgis ir ar nebuvo įsiurbta jokių pašalinių daiktų
krovinio nepavyksta prisiurbti numatyto neigiamojo slėgio nebepavyksta pasiekti atjungus prietaisą neigiamasis slėgis per greitai dingsta	vakuuminio perkėlimo įtaiso nesandarumas dėl susikaupusio purvo tarp guminio sandariklio ir vakuuminio perkėlimo įtaiso	nuimkite nuo vakuuminio perkėlimo įtaiso guminį sandariklį nuvalykite vakuuminį perkėlimo įtaisą ir guminio sandariklio griovelį guminį sandariklį vėl užtraukite ant vakuuminio perkėlimo įtaiso ir pritvirtinkite jeigu reikia, guminį sandariklį pakeiskite
	kempinės guminiai sandarikliai nusidėvėję arba porėti (senėjimas dėl UV spinduliuotės poveikio)	

Šalindami kėlimo įrenginio / valdymo bloko, dyzelinio variklio (HATZ) arba vikšrinio krautuvo („Hinowa“) gedimus, vadovaukitės atitinkamoje naudojimo instrukcijoje pateiktais nurodymais.

6.3 Remontai

- Remontuoti prietaisą gali tik reikiamas žinias ir gebėjimus turintys asmenys.
- Prieš pradedant eksploatuoti vėl specialų patikrinimą turi atlikti ekspertas.

6.4 Pareiga tikrinti

- Savininkas turi užtikrinti, kad bent kartą metuose prietaisą patikrintų ekspertas ir nustatyti trūkumai būtų pašalinti (→ žr. Vokietijos privalomojo draudimo nuo nelaimingų atsitikimų 1-54 gaires ir Vokietijos privalomojo draudimo nuo nelaimingų atsitikimų 100-500 taisykles).
- Būtina laikytis atitinkamų teisės aktų ir atitikties deklaracijos nuostatų!
- Ekspertinį patikrinimą gali atlikti ir gamintojas „Probst GmbH“. Susisiekite su mumis: service@probst-handling.com
- Rekomenduojame atlikus prietaiso patikrinimą ir pašalinus trūkumus gerai matomoje vietoje prikabinti patikros lipduką „Ekspertinis patikrinimas / Expert inspection“ (užsakymo Nr. 2904.0056+TÜV lipdukas su metais).

Ekspertinį patikrinimą būtina dokumentuoti raštu.

Prietaisas	Metai	Data	Ekspertas	Įmonė

6.5 Pastaba dėl duomenų plokštelės

Prietaiso tipas, numeris ir pagaminimo metai yra svarbūs duomenys prietaisui identifikuoti. Juos visada reikia nurodyti užsakant atsargines dalis, teikiant garantinius reikalavimus ar kitus su prietaisu susijusius paklausimus.

Maksimali keliamoji galia nurodo, kokia yra galima maksimali prietaiso apkrova.
Maksimalios keliamosios galios viršyti **negalima**.

Duomenų plokštelėje nurodytą natūrinį svorį reikia įvertinti naudojant kėlimo įrenginį / atraminę įrangą (pvz., kraną, grandininį keltuvą, šakinį krautuvą, ekskavatorių...).

Pavyzdys:

6.6 Pastaba dėl PROBST prietaisų nuomos / skolinimo

Kaskart nuomojant ar skolinant PROBST prietaisus būtinai turi būti kartu pateikta ir atitinkama originali naudojimo instrukcija (jei nesutampa atitinkamos naudojimo šalies kalba, papildomai kartu turi būti pateiktas ir atitinkamas originalios naudojimo instrukcijos vertimas)!

Vacuum Hose Lifter Components
Lifting hose unit with Operating Valve Unit

Keep these Operating Instructions for future use !

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Special Features

The unit is equipped with the following special feature(s):

(See the Appendix for special operating instructions and spare parts.)

If the special features require a separate list of spare parts or parts subject of consumption, the corresponding list in section "Spare parts" is invalid.

1 Safety

1.1 Instructions for the Company

The *Vacuum Hose Lifter* has been manufactured according to current technological standards and is safe. Still, it will present hazards

- ⇨ if the device is not operated by qualified or, at least trained staff,
- ⇨ if the device is used contrary to the approved applications (see 1.5).

Problems can arise:

- ⇨ for the health and life of operators and other persons,
- ⇨ for the lifting device and other valuable goods.

1.2 Instructions for the Installation, Maintenance and Operating Personnel

The *Vacuum Hose Lifter* must be installed and maintained by qualified personnel, mechanics and electricians. Any work on the electrical equipment may be carried out only by a qualified electrician.
Each person in your company involved in the installation, start-up, operation, maintenance, and repair of the device must have read and understood the operating instructions and especially the chapters "Safety" and ”Operating” therein.
Your company must ensure by internal measures

- ⇨ that the operators of the lifting device are properly trained,
- ⇨ that they have read and understood the operating instructions,
- ⇨ that the operating instructions will be available to them at any time.

The responsibilities for the tasks carried out with the device must be clearly organized and observed. Ambiguity regarding responsibilities must not exist.
We recommend that you protect the lifting device from unauthorized use, e. g. by a key-switch.

1.3 Hazard Alert Symbols in this Manual

The hazard alert messages in this manual are labelled as follows:

Danger

Identifies imminent hazard. If you do not avoid it, death or servere injury will result.

Caution

Identifies a potentially hazardous situation. If you do not avoid it, minor or moderate injury can result.

1.4 Installation Site Requirements

The lifting device must not be operated in rooms with explosive atmosphere.
If desired, the *Vacuum Hose Lifter* can be supplied in explosion-protected version.
The ambient temperature must be between +0°C and 40 °C
(if this temperature may be exceeded, consult the manufacturer).
Ensure by internal instructions and checks that the installation site is always clean and well organized.

1.5 Intended Use

Danger

The *Vacuum Hose Lifter* is designed to lift and transport items of all kinds.
The maximum lifting capacity must not be exceeded, however. Observe the name plate!
The loads must be stable enough that they cannot be destroyed during raising!
Transport of persons and animals with the load or the lifting device itself is forbidden!
Unauthorized alteration of the lifting device is forbidden for safety reasons!

Only suction plates of the manufacturer **PROBST** shall be used!!!

Danger

Some suction plates which can be mounted to the device will reduce its carrying capacity.
The maximum load is **indicated** on each suction plate.
Use only suction plates which are approved for this device!
Do not exceed the maximum carrying capacity of the suction plates!!!
Danger: Load (stone slabs) will fall down!

Prohibition

The use of suction plates with a smaller **carrying capacit**y than the lifting unit is **forbidden**! **Danger**: Load will fall down.
(It is permissible to use suction plates with a higher carrying capacity than the lifting unit).

The use of this device is only permitted in proximity to the ground.
The Load **must not** be lifted above **1,8 m** (70,8 inch)!

1.6 Emissions

The equivalent continuous sound pressure level amount in operation (workpiece sucked on) is for the *Vacuum Hose Lifter* below 70 dB (A).

1.7 Special Hazards

The load is held at the suction head by underpressure. If there is a sudden interruption of the vacuum generator, the underpressure at the suction head decreases. As a result the lifting tube of the device descends and the load lowers.
This happens in a sudden power failure. A non-return valve in the rotary suction fitting ensures that the vacuum can escape only slowly. However, this will work only when the regulator lever is moved to "Lift".
When power fails, immediately put the load down if possible. If this is not possible, immediately leave the dangerous area near the load.
The device generates a very strong suction which can draw in hair and clothing. Do not look into the suction opening or place small objects close to suction openings when the device is switched on.

1.8 Workplace

Danger

The workplace of the operator is in front of the control unit.
Make sure, that there will be no unauthorized operating of the main switch from the lifting device (for example with a padlock at the main switch).
Never stand below the load.

1.9 Instructions for the Operator

As an operator of the lifting device you must be trained before start-up. You must have read and understood the operating instructions and especially the chapters "Safety" and ”Operating”.
Be sure, that only authorized persons use the device. You are responsible for others in the operating range of the equipment.
Local safety requirements are fully applicable. Safety instructions in this document are complementary to the rules in force and do not supersede the latter.

1.10 Equipment for Personal Protection

Wear safety shoes when operating the device.
Before transporting dangerous goods the appropriate safety clothes have to be put on.

1.11 Behaviour in Emergencies

As an example sudden power failure is an emergency (the device switches off invariably!).
Turn the control handle fully to position "Lift". The operating unit lowers itself slowly with the load.

1.12 Checking the Guards

A non-return valve is mounted inside the rotary suction fitting. It prevents the load from dropping off the vacuum head if there is a sudden power failure.
Check the function of this non-return valve at the beginning of each shift (when operating in shifts) or once a week (when operating continually).
During the check stay outside the dangerous area.
When power fails, immediately put the load down if possible. If this is not possible, immediately leave the dangerous area near the load.
Checking:

- ⇨ Switch on the lifting device.
- ⇨ Lift a load and turn the control handle fully to position "Lift".
- ⇨ Switch off the lifting device. The device must lower itself slowly with the load. The load must not drop off at once.

Correct faults before operating the device. If faults occur during operation, switch the device off and correct the faults before continuing work with the device.

2 Technical Data

Ambient temperature	0 - 40 °C
Max. lifting stroke	approx. 1550 mm

3 Description

3.1 Components of the *JUMBO*

The *Vacuum Hose Lifter* consists essentially out of:

Pos.	Description	Remarks
1	Coupling	customer connection
2	Rotary suction fitting	customer connection
3	Lifting tube	customer connection
4	Operating unit	with regulator handle
5	Securing net	-
6	Covering for lifting tube	-

3.2 Rotary Suction Fitting

The rotary suction fitting is connected to the suction hose of the blower and the lifting tube (3).
The lifting device is suspended on the rotary suction fitting.
The lifting device can be rotated endlessly.

3.3 Lifting Tube

The lifting tube transmits the vacuum to the vacuum head(s) and realize the lifting movement of the lifting device.

3.4 Control Unit

With the control unit the lifting and lowering of loads is controlled by changing the vacuum in the lifting device. It regulates the flow of outside air to the lifting unit.

The flow of outside air and therefore the vacuum is controlled by an orifice disc. It is operated by a regulator lever (Pos. 4.2). The load is lifted when the control opening is fully closed by the slider. The farther the control opening is open, the more outside air will be drawn in. The load will lower.

3.5 Accessories

Dust Filter

The installation of a dust filter is urgently recommended to protect the fan from all kinds of dirt (dust from surroundings, dirty loads etc.)
Observe the enclosed installation instructions for dust filter.
Note: If no dust filter is used, foreign objects must be excluded from the guarantee as a possible cause of failure.

Motor Overload switch

With this device, the blower can be switched on and off. An integrated overcurrent switch prevents the blower motor form being damaged by high current.

Tube cylinder Extension

The tube cylinder extension is designed for handle parts in high-sided boxes, crates, wire-mesh boxes, etc. The tube cylinder extension has to be mounted between the vacuum head and the control unit.

Vacuum gauge

The vacuum gauge indicates the underpressure at the vacuum head and thereby the status of operation of the lifting device. It is mounted at the control unit.

Protection Tube

The protection tube is a protective covering for the lifting tube.

Retaining net

The retaining net is for space-saving storage of the lifting device. The length of the lifting tube is reduced to a minimum.

4 Installation

4.1 Installation Procedure

The *Vacuum Hose Lifter* must be installed and maintained by qualified personnel, mechanics and electricians. Any work on the electrical equipment may be carried out only by a qualified electrician.

Blower Installation

⇨ Install the vacuum blower as described in the separate operating instructions.

Checking the Rotation Direction

Before commissioning, check that the blower rotation direction corresponds with that in the separate manual.

Caution

When mounting the suction hose, observe that the hose is hanged up spirally turned (∅ at least 800 mm). Its length has to be the 1.3 to 1.5 times the jib length. The suction hose must hang down freely. It must not lie flat, rub or catch on anything.

Danger

⇨ Mount the rotary suction fitting (7) to the transport trailer (5) of the crane. Fasten it safely! Insert the transport trailer into the crane jib (2).

⇨ Mount the end stop (6) at the end of the crane jib. Never work without an end stop on the crane jib, otherwise the lifting device can fall off.

⇨ Connect the suction hose to the rotary suction fitting (4) and secure it with a hose clamp.

If you install the suction hose, note that the hose contracts under the pressure of vacuum by approximately 10 to 15 %.
Therefore, a loose installation with length compensation should be provided. Longer, linear distances can also be bridged with a plastic pipe. The overall length should not exceed 50 m. Long suction hoses reduce the capacity and the dynamics of the tube lifter.

4.2 Adjusting the Hovering Position (without load)

The hovering position of the lifting device must be adapted to the weight of the vacuum head. A valve (2) in the tube support cylinder is used to adjust it.
When you apply the vacuum head to the load a valve is fully opened by a plunger and the valve rod in the vacuum head. The load can be sucked and lifted.
Adjustment:

⇨ Turn the adjustment screw (1) at the operating unit (accessible from the bottom).
Turn clockwise (direction of arrow) ➔ Valve becomes opened.
Turn counter-clockwise ➔Valve becomes closed.

⇨ The farther the valve is opened the lower the device hovers.

Danger

When the valve is closed totally the device bounce up abruptly as soon the blower is switched on!

4.3 Replacing the lifting tube

Caution

The lifting tube can be replaced on-site.

The lifting tube must always be installed with the reinforced section at the bottom!

Procedure:

- ⇨ Clamp the rotary inlet in a vice, holding it by the screws of the tube holder (Fig. 1).
- ⇨ Remove the protective caps from the ends of the threads of the hose clamps.
- ⇨ Use a spanner to remove the hose clamps from the tube cylinder (Fig. 2) and the rotary inlet (Fig. 3).
- ⇨ Remove the adhesive tape from the old lifting tube.
- ⇨ Unscrew the old lifting tube from the tube mounting of the tube cylinder (Fig. 4).
- ⇨ Unscrew the lifting tube from the tube mounting of the rotary inlet (Fig. 5).
- ⇨ Lightly grease the threads of the tube mountings (Fig. 6).
- ⇨ Mount the new lifting tube with the reinforced section at the bottom!
- ⇨ Fully screw the new lifting tube onto the threads of the rotary inlet (Fig.7).
- ⇨ Fully screw the new lifting tube onto the threads of the tube cylinder (Fig. 8).
- ⇨ Wind tow full turns of adhesive tape (Coroplast) around the ends of the lifting tube to seal it to the tube cylinder (Fig. 9) and the rotary inlet (Figs. 10, 11).
- ⇨ Place the hose clamps on the ends of the lifting tube and tighten them with a torque of 10 Nm, using a torque wrench (Fig. 12).
- ⇨ Fit the protective caps on the ends of the threads of the hose clamps.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

Serial number →

Lifting tube dimension →

← Article number lifting tube

5 Operating

5.1 Safety Instructions

Local safety requirements are fully applicable. The following safety instructions are complimentary to the rules in force and do not supersede the latter:

- ⇨ Wear safety shoes.
- ⇨ Before transporting dangerous goods the corresponding safety clothes have to be put on.
- ⇨ Never exceed the maximum lifting capacity of the lifting device. Observe the name plate on the handle.
- ⇨ Do not stand below the load. Always keep clear of the load.
- ⇨ Never carry people or animals with the load or the lifting device itself !
- ⇨ Operate only when you can view the entire working area. Look out for other persons in the working area.
- ⇨ Never manoeuvre loads above people.
- ⇨ Never lean about lifted loads.
- ⇨ Do not let go of the handle whilst lifting a load.
- ⇨ Do not pull loads to the side or drag them along with the lifting device.
- ⇨ Do not rip loose loads that have become jammed.
- ⇨ If there is a power failure immediately turn the handle (***JUMBOERGO***) resp. push upwards the regulator lever (***JUMBOSPRINT***) fully to "Lift" to prevent the load from dropping off. The reserve vacuum will let the lifting device lower slowly with the load.
- ⇨ Apply suction and lift only to appropriate loads (check for stability and porosity).
- ⇨ The lifting device is mounted into the crane rails with rail end stops. While moving against the rail end stops, strong horizontal forces can occur. These forces can result in releasing the load.

Danger

If the lifting unit (lifting tube) is not able to lift the vacuum-gripped load, never try to support the lifting of the load, it is possible that the gripper's holding force is inadequate.
The load could fall ➔ risk of injury.

5.2 Lifting, Lowering and Landing Loads

The following operating steps must be checked by a qualified mechanic prior to use of the device by the operating personnel. Correct faults before start-up.

The hovering position (without load) must be adjusted prior to start up, see 4.2.

Danger

Lifting

- ⇨ Place the vacuum head directly above the load.
- ⇨ Press the regulator lever (1) down. The lifting tube descends and the vacuum head lowers.
- ⇨ Apply the vacuum head to the load. Distribute load evenly.
- ⇨ Slowly push the regulator lever (1) upward. The device attaches to the load.

Attention: the regulator lever must not be on the position "Lift" for more than 90 seconds because otherwise:

- ⇨ the blower could be damaged and fail, all guarantee claims are void!
- ⇨ power is wasted unnecessarily.

Attention

Adjusting the hovering position with load

Turn the adjusting screw (2) to adjust the hovering position with the load.
Caution: Do not confuse this adjustment with the hovering position without load.

- ⇨ Turn screw clockwise ➔ the hovering position will be lower.
- ⇨ Turn screw counter-clockwise ➔ the hovering position will be higher.

Attention: the hovering position with load should not be adjusted to the highest position of the control unit because otherwise:

Attention

- ⇨ the blower could be damaged and fail,
  all guarantee claims are void!
- ⇨ power is wasted unnecessarily.

Lowering, Placing

- ⇨ Slowly move the regulator lever (1) downward - "Lower". The lifting tube descends and the vacuum head lowers with the load.
  Do not operate the regulator lever control abruptly, while you firmly hold the handlebar (3), as this can cause the load to fall off, because the vacuum suddenly vanishes.

Danger

- ⇨ Lower the load to the chosen position.
- ⇨ To land the load push the regulator lever down all the way. Tip the valve control box a little and lift it off the load.

6 Trouble Shooting

The device must be installed and maintained by qualified personnel, mechanics and electricians. Any work on the electrical equipment may be carried out only by a qualified electrician.
After each repair or maintenance job check the guards as described in the Operating Manual ”Safety”.

If a load cannot be lifted, check through the following list to find the problem and correct it.

Error	Remedy
Opposite direction of rotation	⇨ Transpose the phases of the blower connection.
The required vacuum is not reached	⇨ Check the suction hose and tube lifter for airtightness. ⇨ Check the mounting of the suction heads ⇨ Clean resp. replace the dust filter cartridge
The load is too heavy	Split the load, use other lifting device.
The load is too porous or of low bending strength	Load cannot be lifted, try using a different vacuum head.
Suction hose is damaged	Replace hose or cut out damaged piece and connect remaining hose with a tube and hose clamps
Vacuum lifting tube is damaged	Replace the vacuum lifting tube
Connection of the vacuum head is damaged	Check seal on the tube cylinder, replace it.
Vacuum head is damaged	Check seal on the vacuum head, replace it.
The load drop off when you lower it	Please contact the manufacturer
The vacuum is reached but the lifting device can not lift porous loads	Please contact the manufacturer
The control unit of the tube lifter hangs in the upper block position (with running blower) even without load and is not coming down by turning the handle or regulator lever	⇨ Turn the adjustment screw at the control unit clockwise ⇨ Clean or replace the dust filter of the control unit

7 Maintenance

7.1 General Notes

The *Vacuum Hose Lifter* may be installed and maintained only by qualified personnel such as mechanics and electricians.
After any repair or maintenance work, check the safety devices as described in the section "Safety".

7.2 Cleaning

The maintenance proceedings and intervals are described in the service-table.
Use cleaning detergent to clean the device (do not use petrol (gasoline) or aggressive or corrosive fluids to clean the device. The vacuum lifting tube and the suction hose will otherwise become leaky or be destroyed).
Remove items and contaminations such as adhesives, glue, saw dust, dust etc. sticking to the vacuum heads at least once a week. Use glycerine to clean the seals. Immediately replace damaged vacuum heads (tears, holes, waves).

7.3 Accident prevention rules

Accident prevention rules require a yearly inspection of lifting device and crane by a qualified person.

7.4 Service-Table

	Interval				
	daily	weekly	monthly	1/2-yearly	yearly
Tube Lifter					
Is the lifting tube in good condition (not porous, no scrubbing spots, no holes and with that tight)?			X		X
Is the fastening of the lifting tube correct (wire clips at the correct place, tightening)?					X
Can the rotary suction fitting be rotated easily itself?			X		X
Does the rotary handle resp. the control handle operates smooth?			X		X
Are all junctions fixed, hose band clips etc.?					X
Are the type- and the lifting- capacity label still on the machine?					X
Is the operating instruction still present and does the worker know of it?					X
Is the handle firm?					X
Is the filtermat still at the operator unit and is it cleaned?			X		X
Check supporting parts (such as the suspension of the device) on deformation, wear, rust or other damages.				X	
Function					
Can the device be lifted and lowered without weight easily ? (Adjusting the valve in the operating unit)			X		X
JumboSprint: Can the hovering position of the device with weight be adjusted easily ? (Adjusting the adjusting screw at the operating unit)					X
Does the non return valve work by power failure?			X		X
Check the general condition of the machine.					X

8 Notes on the Name Plate

On the nameplate the main data for the lifting device is indicated.
The nameplate is firmly connected to the device.
The nameplate contains the following information:

Caution

Type and number are vital for identification of the unit. Indicate these when ordering spares or filing claims and other inquiries.

The max. lifting capacity indicates for which maximum load the device can be used. The max. load must not be exceeded.

9 Storage

If you are not using the Jumbo Sprint vacuum hose lifter, you should store it correctly to best preserve the product quality. This entails the following:

- ⇨ Clean the product (see 7.2) and let it dry if wet
- ⇨ Store the product in a room that protects it from moisture and frost (recommendation: in the manufacturer's storage case)
- ⇨ Storage temperature: +0 – 40 °C

To start up the system again, refer to chapter 4, "Installation"

10 Guarantee, spare and consumable parts

This equipment is guaranteed in accordance with our General Conditions of Business. This also applies to spare parts where these are original parts supplied by us.

We will assume no liability for damage caused by the use of non-original spare parts and accessories.

Wear and consumable parts are not covered by the guarantee.

The most important spare and consumable parts are shown in the following list.

Abbreviations:	- Spare part	**= E**
	- Consumable part	**= V**
	- Consumable-part assembly, contains consumable parts	**= VB**

Hubeinheit mit Bedieneinheit
Ersatzteile/ /Spare Parts

Hubeinheit / Lifting Hose Assy

Dreheinheit / Rotation Unit

Hubeinheit mit Bedieneinheit
Ersatzteile/ /Spare Parts

Hubeinheit / Lifting Hose Assy						
Pos.	*Menge / Amount*	*Bezeichnung*	*Description*	*Abmessung / Dimension*	*Art. No.*	*Legende*
6	1	G 2“ - L 56 - D 66,3	G 2“ - L 56 - D 66,3		2700.0007	E
8	1	Flachsauggreifer_PFG	Flat suction pad_PFG		4210.0610	V
14	1	DIN 472 - 54 x 2,0	DIN 472 - 54 x 2,0		2048.0025	E
15	1	V-Ring	V-ring		4210.0611	V
16	1	Kugellager	Bearing		2135.0022	E
17	1	DIN 471 - 65 x 2,5	DIN 471 - 65 x 2,5		2048.0026	E
23	1	Hubschlauch	Lifting hose	PVC	2527.0010	V
24	2	Schlauchschelle	Hose clamp	SSB	2105.0068	E
25	4	Kappe für SSB	Cap for SSB		2202.0042	E
26	1	Haltenetz	Securing net		2527.0005	V
27	1	Kupplung	Coupling		4200.0042	E
28	1	Schutzhülle	Covering for lifting tube		2529.0007	E

E= Ersatzteil, **V= V**erschleißteil, **VB= V**erschleißteil**b**augruppe, enthält Verschleißteile
E= Spare part, **V=** Consumable part, **VB=** Consumable-part assembly, contains consumable parts

Hubeinheit / Lifting Hose Assy						
Pos.	*HE 35-E/S-BP*	*HE 50-E/S-BP*	*HE 80-E/S-BP*	*HE 150-E/S-BP*	*HE 200-E/S-BP*	*HE 300-E/S-BP*
23	11.04.01.10007	11.04.01.10028	11.04.01.10066	11.04.01.10178	11.04.01.10070	11.04.01.10129
24	10.07.10.00048	10.07.10.00049	10.07.10.00039	10.07.10.00046	10.07.10.00040	10.07.10.00065
26	11.01.12.10141	11.01.14.10058	11.01.05.10248	11.01.23.10043	11.01.25.10039	11.01.25.10084
28	11.04.01.10023	11.04.01.10018	11.04.01.10017	11.04.01.10132	11.04.01.10073	11.04.01.10127

E= Ersatzteil, **V= V**erschleißteil, **VB= V**erschleißteil**b**augruppe, enthält Verschleißteile
E= Spare part, **V=** Consumable part, **VB=** Consumable-part assembly, contains consumable parts

Hubeinheit mit Bedieneinheit
Ersatzteile/ /Spare Parts

Ventileinheit , Bedieneinheit / Valve Unit ,Operating handle

Ventileinheit / Valve Unit

Hubeinheit mit Bedieneinheit
Ersatzteile/ /Spare Parts

Ventileinheit , Bedieneinheit / Valve Unit ,Operating handle						
Pos.	*Menge / Amount*	*Bezeichnung*	*Description*	*Abmessung / Dimension*	*Art. No.*	*Legende*
1	1	Ventilgehäuse kpl.	Valve casing compl.		4210.0612	E
2	1	Federklappe	Spring flap		4210.0608	E
9	1	Reibbelag	Friction lining		4210.0613	E
10	1	Scheibe	Disk		4210.0614	E
13	1	Schieber	Slide		4210.0401	E
14	1	Hülse	Socket for slide		4210.0535	E
15	1	Gleitlager	Bearing bush		4210.0536	E
18	1	Zugfeder	Tension spring	Z 066 OI	2171.0008	E
20	1	Stellschraube	Adjusting screw		4210.0403	E
24	1	Zugfeder	Tension spring	Z 081 HI	2171.0009	E
26	1	Filtermatte	Filter mat		2505.0010	V
27	1	Abdeckung f. Ventilklappe	Cover for valve unit		4210.0615	E
28	1	Rändelschraube	Knurled screw		2009.0038	E
45	1	Manometer VAM	Manometer VAM		2213.0007	E
56	1	Druckfeder	Sring (pressure)		2170.0044	E
59	1	Ventilklappe	Valve flap		4210.0558	E
64	2	Druckfeder	Sring (pressure)		2170.0045	E
65	1	O-Ring	O-ring seal		2155.0087	V
66	1	Rändelmutter	Knurled nut		2019.0021	E
75	4	Spannhaken	Tension hook		2106.0011	E
79	2	Schlitzgummiring	Ruber seal		4210.0091	V
82	1	Haltebügel	Supporting strap		4210.0405	E
87	1	Reguliergriff	Control handle		4210.0406	E
99	1	Rundstab	Rod		4210.1051	E

E= Ersatzteil, **V= V**erschleißteil, **VB= V**erschleißteil**b**augruppe, enthält Verschleißteile
E= Spare part, **V=** Consumable part, **VB=** Consumable-part assembly, contains consumable parts

Installation carrier TRANSMOBIL TM-150-D-A-XL

Tragkraft 200 / 250 kg
Lifting capacity 440 / 550 lbs

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 1510,5 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	22.1.2013	Ralf.Northe
Gepr.		

Benennung
TRANSMOBIL TM-150-D-A-XL
Ausführung Diesel Automatik
mobiles Transport- und Verlegegerät für Bordsteine und Platten, mit Knickausleger

WA:
Kunde:

Artikelnummer/Zeichnungsnummer
D52220012

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst handling equipment

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		Datum	Name
	Erst.	22.1.2013	Ralf.Northe
	Gepr.	8.10.2018	I.Krasnikov

Benennung
TRANSMOBIL TM-150-D-A-XL
Ausführung Diesel Automatik
mobiles Transport- und Verlegegerät für Bordsteine und Platten, mit Knickausleger

Artikelnummer/Zeichnungsnummer
E52220012

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst handling equipment

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		Datum	Name
	Erst.	13.10.2011	Perumal.Hurth
	Gepr.	15.9.2016	I.Krasnikov
1			

Benennung
Aufnahme für Bedieneinheit BE

Artikelnummer/Zeichnungsnummer
E42100568

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 1481,5 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	22.1.2013	Ralf.Northe
Gepr.		

Benennung
Grundeinheit TM150-D-A-XL breit
Stahlbau kpl., Tragf. 200/250 kg

WA:
Kunde:

Artikelnummer/Zeichnungsnummer
E42220128

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst handling equipment

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		Datum	Name
	Erst.	6.5.2013	Ralf.Northe
	Gepr.	25.2.2016	R.Northe

Benennung
Grundeinheit TM150-D-A-XL breit
Stahlbau kpl., Tragf. 200/250 kg

Artikelnummer/Zeichnungsnummer
E42220153

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 67,5 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	4.2.2013	Ralf.Northe
Gepr.		

Benennung
Konsole kompl. für TM150-XL

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220129

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 92,3 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	14.1.2013	Ralf.Northe
Gepr.		

Benennung
Ausleger kompl. TM150-XL

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220135

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst
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Bei Änderungen Rücksprache TB !

Gewicht: 57,82 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

		Datum	Name
	Erst.	30.1.2013	Ralf.Northe
	Gepr.	7.11.2019	P.Hafenbrak

Benennung
Auslegerarm TM150-XL hinten kompl.

WA:
Kunde:
Zust. 1
Urspr.

Artikelnummer/Zeichnungsnummer
E42220136

Blatt 1 von 1

Ers. f.
Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 34,6 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	14.1.2013	Ralf.Northe
Gepr.		

Benennung
Knickausleger Vorderteil TM150-XL kpl.

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220138

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 108,6 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	24.1.2013	Ralf.Northe
Gepr.		

Benennung
Mast kompl. TM150-XL

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220132

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst handling equipment

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		Datum	Name
	Erst.	20.11.2013	Ralf.Northe
	Gepr.	9.3.2015	M.Wunder
1			

Zust. | Urspr. | Ers. f. | Ers. d.

Benennung

Vakuum-Gebläseeinheit
für Trans Mobile TM-150-XL
mit VGE-3RGh, kpl. mit Gehäuse und HD-Motor

Artikelnummer/Zeichnungsnummer

E42220164

Blatt 1 von 1

probst handling equipment

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		Datum	Name
	Erst.	26.6.2012	Michael.Wunder
	Gepr.	9.9.2015	M.Wunder
2			
1			
Zust.	Urspr.		

Benennung

Gebläseeinheit für TM-2
ohne Schalldämmkasten
mit VGE-3RGh, kpl. mit Gehäuse
und HD-Motor, Vacuvane Gebläse

Artikelnummer/Zeichnungsnummer: E42220120

Blatt 1 von 1

Ers. f.

Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 16,3 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	25.4.2013	Ralf.Northe
Gepr.		

Benennung
Umbauteile auf TM-D-A-XL

Steuersäule, Steuerung

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220110

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

siehe separate Liste
see separate list

probst handling equipment

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		Datum	Name
	Erst.	23.1.2013	Ralf.Northe
	Gepr.	16.9.2021	R.Northe

Benennung
Umbauteile auf TM-D-XL
bestehend aus D-Motor,
Pumpe, Batterie,Halterung, HD-Schaltplan
und Abgasrohr

Artikelnummer/Zeichnungsnummer
E42220142

Blatt 1 von 1

Zust.	Urspr.	Ers. f.	Ers. d.

probst
the better solution

Bei Änderungen Rücksprache TB !

Gewicht: 6,9 kg

Schutzvermerk nach DIN 34 beachten!
Nachdruck nur mit unserer Genehmigung!

	Datum	Name
Erst.	4.2.2013	Ralf.Northe
Gepr.		

Benennung
Haube TM 150-D-XL komplett

WA:

Kunde:

Artikelnummer/Zeichnungsnummer
E42220144

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

probst handling equipment

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		Datum	Name
	Erst.	13.7.2018	R.Seidel
	Gepr.	13.7.2018	R.Seidel

Benennung
Bolzen mit Handgriff mit Seilsicherung und Karabiner

Artikelnummer/Zeichnungsnummer
E42200417

Blatt 1 von 1

Zust. | Urspr. | Ers. f. | Ers. d.

A52220010 TM-150-B-XL
A52220011 TM-150-D-XL
A52220012 TM-150-D-A-XL
A52220014 TM-150-D-A-SILENT-XL

Einige der Abbildungen sind möglicherweise optionales Zubehör des Gerätes/Some of pictures may be optional equipment of the device.

A52220010 TM-150-B-XL
A52220011 TM-150-D-XL
A52220012 TM-150-D-A-XL
A52220014 TM-150-D-A-SILENT-XL

29040107

29040687

29040451

DIESEL ☑ BIO-DIESEL ☒

29040483
Gilt für 52220011, 0012, 0014

probst handling equipment

29040028

probst handling equipment

29040540

29040477

probst handling equipment

29040540

29040585

29040477

Einige der Abbildungen sind möglicherweise optionales Zubehör des Gerätes/Some of pictures may be optional equipment of the device.

A52220010 TM-150-B-XL
A52220011 TM-150-D-XL
A52220012 TM-150-D-A-XL
A52220014 TM-150-D-A-SILENT-XL

Einige der Abbildungen sind möglicherweise optionales Zubehör des Gerätes/Some of pictures may be optional equipment of the device.

Operation, Safety, Maintenance and service Manual

Original Instructions - Keep this manual with the machine at all times.

TRACKED FORKLIFT
PT20GL/TP2000/169835
TP2000/17189300CA

CE

TP2000171893021216

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EC DECLARATION OF CONFORMITY TP2000

MINIESCAVATORI - MINIDUMPERS - CARRI CINGOLATI - PIATTAFORME AEREE - PALE COMPATTE

Nogara, __.__.__

DICHIARAZIONE DI CONFORMITA' CE

EG CONFORMITY DECLARATION

LA SOCIETA' **HINOWA S.p.A.** con sede in VIA FONTANA-37054 NOGARA (VR) ITALIA
THE COMPANY HINOWA S.p.A. main office in VIA FONTANA-37054 NOGARA (VR) ITALY

DICHIARA

DECLARES

SOTTO LA PROPRIA ESCLUSIVA RESPONSABILITÁ CHE IL PRODOTTO DENOMINATO
ON ITS OWN EXCLUSIVE RESPONSIBILITY THAT THE PRODUCT CALLED

" SOLLEVATORE "

"LIFT"

" **DESTINATO AD UTILIZZO MOVIMENTO TERRA**/ DESTINED FOR GROUND MOVING PURPOSES "

MODELLO MODEL	**TP2000**
MATRICOLA SERIAL NUMBER	**___TP**
ANNO DI COSTRUZ. CONSTRUCTION YEAR	**2008**

AL QUALE QUESTA DICHIARAZIONE SI RIFERISCE, E' CONFORME AI REQUISITI ESSENZIALI DI SICUREZZA PREVISTI DALLE DIRETTIVE 98/37, 89/336, E SUCCESSIVE MODIFICHE.
TO WHICH THIS DECLARATION REFERS,COMPLIES WITH THE ESSENTIAL SAFETY REQUIREMENTS PROVIDED FOR BY DIRECTIVES 98/37 CE, 89/336 AND SUBSEQUENT MODIFICATIONS.

Il Legale Rappresentante

HINOWA s.p.a. - Via Fontana - 37054 NOGARA (Verona) - ITALIA - Tel. +39 (0)442 539100 - Telefax +39 (0)442 539075 - E-mail: hinowa@hinowa.it
web site: www.hinowa.com - Reg. Impr. C.C.I.A.A. 01996640239 - R.E.A. 210602 - Cod. Fisc. e Part. Iva IT 01996640239 - Cap. Soc. € 1.500.000,00 i.v.

INTRODUCTION

- This manual is made to permit customers to properly employ Hinowa hydraulic units on the machines they have designed.
- Read this manual with care before making mechanical and hydraulic connections between the Hinowa hydraulic unit and your machine.
- Continuous improvements in Hinowa products may lead to have illustrations in the manual that do not match exactly with the parts that are used.
- No matter where you live or work do not hesitate to contact our engineering department which is at your full disposal for all useful information and, in case, to furnish you with any genuine spare parts you may require: these are the only spare parts that guarantee quality and perfect interchangeability.
- To submit a correct request for the spare parts needed, it is necessary to quote the undercarriage serial no. on every order.

DECLARATION OF INCORPORATION

Preliminary remark: The product hydraulic unit is a partly completed machinery which cannot in itself perform a specific and autonomous application, as it is without any tools, utensils or other parts for a specific application. Therefore, in conformity with the provisions of the Machinery Directive, Chapter 1, Article 1, this product does not fall within the scope of this directive and is not subject to the provisions in Chapter 1, Article 5 and Chapter 2, Article 8. As per Annex II, point B (see Chapter 1, Article 4, point 2) this product is only intended to be incorporated into or assembled
with other machinery, thereby forming machinery to which the Machinery Directive applies.

Given this,

The **HINOWA S.p.A**. Company
Via Fontana - 37054 NOGARA (VR) - ITALY
Tel. +39 0442 539100 - Fax +39 0442 539075

STATES

That it is forbidden to put HINOWA hydraulic units series TS in service before the machine in which they have been incorporated has been stated to comply with the provisions of Machinery Directive (EEC directive 2006/42) and subsequent modifications.

NOMENCLATURE

To make the safety warnings and the operation and maintenance instructions easier to understand, the names of the various parts of the tracked forklift are listed here below:

1 Idler roller assembly
2 Tracked undercarriage chassis
3 Roller
4 Traction wheel
5 Travel reductin gear oil
6 Track
7 Forks
8 Platform
9 Hydraulic oil tank
10 Lifting guides
11 Swing cylinders

12 Control lever guard
13 Lifting cylinder
14 Hydraulic distributor
15 Lifting points

CONTROL STATION

The control station is the position at the rear of the machine where the operator stands (on the platform), securely anchored to the control levers.

WARNING

The operator must control the machine from the control station. The maximum possible protection has been provided, taking in consideration that the machine can also be used off-road; nonetheless if the operator does not stand in the specified position his/her lower limbs may be crushed by the tracks.

INFORMATION ON SAFETY

To avoid accidents, before starting work and before performing any maintenance operations, all the precautions and warnings contained in this manual must be read, understood and observed.

This is the safety warning symbol.
When this symbol is identified on the machine or in this manual, care must be taken to avoid the risk of potential personal injuries.
Observe the suggested precautions and the instructions.

The words **DANGER** and **WARNING** are used together with the safety warning symbol.

The word **DANGER** indicates potential situations of danger that may be the likely cause of serious injuries or death. In addition, serious damage may also be caused to the machine.

DANGER

The word **WARNING** indicates potential situations of danger, which if not avoided may cause minor damage or personal injuries.

WARNING

This wording may also be used when there is only the risk of damaging the machine.
This message is used in situations where, unless the due precautions are taken, the life of the machine may be affected.

IMPORTANT

Hinowa has carefully analysed the risks deriving from the normal use and maintenance of the machine. Nonetheless, improper use and maintenance performed using unsuitable equipment by persons who are not appropriately trained may bring about situations of serious danger to the operator.

PICTOGRAMS ON THE TP2000

1) READ THE MANUAL (POS. 8 - TABLE 01)

Carefully read the contents of this manual before commissioning, use, maintenance, refuelling or other operations on the machine.

Label position: in front of the operator on the distributor support.

2) MACHINE WORKING (POS. 13 - TABLE 01)

Keep outside of the operating range of the moving machine.

Label position: right- and left-hand side of the lifting guides.

3) TRAVELLING DIRECTION (POS. 5 - TABLE 01)

This label indicates the recommended travelling direction, so that impact with any obstacles to be driven over can be dampened by the shock absorbers connected to the idler roller.

Label position: tracked undercarriage chassis.

4) DISTRIBUTOR CONTROLS, TP2000, FIXED UNDERCARRIAGE, PETROL ENGINE (POS. 1 - TABLE 01)

Label position: distributor guard.

5) SAFETY DISTANCE (POS. 21 - TABLE 01)

This label warns anyone in the vicinity to be careful and keep a safe distance from the working machine as the lifted loads may cause serious harm or damage to people.

Label position: on the lifting guides.

6) HYDRAULIC OIL (POS. 16 - TABLE 01)

OLIO IDRAULICO
HYDRAULIC OIL
HUILE HYDRAULIQUE
HYDRAULISCHES OIL
ACEITE HIDRÁULICO
HYDRAULISCHE OLIE

Label position: on the hydraulic oil tank.

7) CLOTHING AND PROTECTIVE EQUIPMENT (POS. 4 - TABLE 01)

When using the machine or performing maintenance, wear a hard hat, glasses, safety footwear, gloves and acoustic earmuffs.

Label position: in front of the operator on the distributor guard.

9) HYDRAULIC OIL FILTER (POS. 12 - TABLE 01)

Indicates the position of the hydraulic oil filter.

Label position: in front of the operator on the hydraulic oil tank, under the distributor guard.

10) HYDRAULIC OIL LEVEL INDICATOR (POS. 7 - TABLE 01)

Indicates the position of the hydraulic oil level indicator.

Label position: in front of the operator on the hydraulic oil tank.

12) LIFTING POINTS (POS. 6 - TABLE 01)

Indicates the points to be used for lifting the machine.

Label position: near the anchorage eyelets on the forklift guide.

15) MAX. LOAD PERMITTED (POS. 22 - TABLE 01)

Indicates the maximum load permitted and the maximum vertical and horizontal distance from the forks.
It is forbidden to exceed the capacity limit and the indicated distance of the load's centre of gravity from the forks.

Label position: on the distributor support.

16) AVOID LIFTING PEOPLE (POS. 14 - TABLE 01)

Indicates that it is forbidden to get on the lifting forks and to use the forklift as a lifting platform.

Label position: at the level of the lifting guides.

17) NO MAINTENANCE WITH MOVING PARTS (POS. 18 - TABLE 01)

Indicates that no maintenance operations may be performed when there are moving parts.

Label position: in front of the operator on the hydraulic oil tank.

18) DANGER OF CUTTING THE UPPER LIMBS (POS. 15 - TABLE 01)

Indicates that the operator must pay the utmost attention to the moving parts during work.

Label position: at the level of the lifting guides / in front of the operator on the distributor guard.

19) HOT SURFACE - RISK OF BURNING (POS. 10 - TABLE 01)

Indicates that the operator must pay the utmost attention to the hot surfaces of the machine.

Label position: near the exhaust silencer.

20) CRUSHING HAZARD FEET (POS. 23 - TABLE 01)

Indicates areas where there is a danger of crushing lower limbs for the operator.

Label position: tracked undercarriage chassis.

REPLACE THE LABELS AND THE PLATES IF THEY ARE DAMAGED.

FAILURE TO HEED ANY WARNINGS, DUE TO THE DAMAGE, LOSS OR NON-OBSERVANCE OF A SAFETY LABEL, MAY CAUSE SERIOUS ACCIDENTS.

POSITION OF PICTOGRAMS ON THE TP2000

SAFETY AND ACCIDENT PREVENTION

1 GENERAL PRECAUTIONS

DANGER

1.1 CAREFULLY READ THE INSTRUCTIONS

Before performing any operation on the machine, implement all the safety standards, precautions and instructions described in the manual.

1.2 FOLLOW THE SAFETY INSTRUCTIONS

Read all the safety messages in this manual and the safety signs on the machine. Check that the safety signs are in good condition, replacing any missing or damaged signs.
Make sure that when replacing any components or fitting new equipment, the safety signs are correct.
Learn the correct way to operate the machine and use the controls.
Do not allow any unauthorised or not specifically trained persons to operate and/or perform maintenance on the machine.

1.3 CLOTHING AND PROTECTIVE EQUIPMENT

Avoid wearing loose clothing, rings, watches or anything else that may get caught in moving parts. Also avoid wearing oil- or fuel-stained garments, as these are readily flammable.
When using the machine or performing maintenance, wear a hard hat, glasses and safety footwear, a mask, gloves and acoustic earmuffs.
When working for a period of 8 hours with a noise level over 85 dBA, always wear suitable ear protection.

1.4 UNAUTHORISED MODIFICATIONS

It is strictly prohibited to make any modifications to the machine that may compromise its operation and safety. **Hinowa** is not liable for any injuries or damage caused by unauthorised modifications.

1.5 SAFETY VALVES

It is strictly prohibited to modify and/or tamper with the safety and control valves on the hydraulic system. **Hinowa** is not liable for any damage to people, things and to the machine when the standard adjustments of the hydraulic valves are changed.

PRECAUTIONS FOR USE

2 THE PRECAUTIONS TO BE TAKEN BEFORE STARTING WORK

2.1 SAFETY IN THE WORKPLACE

DANGER

Before starting the engine, carefully check the conditions of the ground where the machine will be working to look for any irregularities that may make the work dangerous or the machine unstable.

Always look out for people who enter the machine's working area.
Use suitable signs to warn people before moving the machine, and prevent anyone from approaching the working zone when the machine is operating.

WARNING

The machine is NOT fitted with a protective structure against overturning or the falling of objects from above.
Before starting work, make sure there is no risk of overturning or falling objects that may directly or indirectly hit the operator.

3 PRECAUTIONS TO BE ADOPTED WHEN WORKING

DANGER

3.1 PRECAUTIONS WHEN STARTING THE ENGINE

Check your machine carefully by walking around it before starting the engine.
Warn any people nearby that you are about to start the machine. Do not allow anybody to climb onto the machine.

3.2 PRECAUTIONS WHEN DRIVING

To avoid the possibility of accidents or loss of control, do not climb onto the forklift; stand on the platform behind it and hold the grips tightly.
Keep children and animals away from the working area to avoid injuries due to contact with the machine.

Use the tracked forklift at night only if the working area is suitably lit.

3.3 PRECAUTIONS WHEN TRANSPORTING THE LOAD

To avoid accidents or overturning, observe the load limits specified in this manual.
Make sure that the load is still and that it does not protrude from the outline of the forklift or impede the operator's view. Keep the load away from the exhaust silencer.
To avoid overturning, do not change the direction of travel when operating on slopes.
Do not travel uphill or downhill on inclines with a gradient exceeding 20°. Before transporting the load on slopes, make sure that there is no risk of overturning.
Take care when using the machine in reverse, as in this situation the risk of falling or sliding increases.
On steep declines, always travel at minimum speed. Never travel downhill in reverse, and pay special attention when the gradient changes.

3.4 TRANSPORTING THE MACHINE

Strictly heed the local regulations when transporting the machine on public roads.
Use a truck or trailer suitable for transporting the machine.
Always unload and load the machine on a solid and flat surface.
Remember to use a ramp or a loading platform to load/unload the machine.
Never select the quick speed control during these operations.
Avoid steering when driving up or down a ramp, as this is extremely dangerous. If steering is unavoidable, first return to the ground or the loading platform, then change direction and start driving again.
Never operate any levers other than the gear levers when driving up or down a ramp to avoid the risk of the machine losing balance.
At the top end of the ramp when reaching the bed of the vehicle there is a change in slope.
Take care when driving over this section.
Secure the chains or cables to the chassis of the machine.
Read the chapter on transport.

3.5 PARKING THE MACHINE SAFELY

Park the machine on a wide and level area, where the ground is firm, with the forks completely lowered.
If this is not possible and you need to park on a slope, place chocks under the tracks.

3.6 EMERGENCIES

React promptly if a fire breaks out.
Before starting work, find out where the first aid kit and the extinguishers are kept in the working area, so as to be able to react promptly in the event of fire or accidents.
Keep the emergency telephone numbers for doctors, ambulance, hospital and fire brigade near your telephone.

3.7 PROTECTIVE GARMENTS

Wear tight-fitting clothes and use safety equipment suitable for the job at hand.

3.8 PROTECTION AGAINST NOISE

Extended exposure to noise may cause injuries or loss of hearing.
Use suitable equipment, such as earplugs or earmuffs, to protect yourself against unbearable or deafening noise.

4 OPERATING INSTRUCTIONS

4.1 OPERATING POSITION AND CONTROLS

A - Carriage R travel control lever
B - Fork swing control lever
C - Fork lifting control lever
D - Carriage L travel control lever
E - 2nd travel speed lever
F - Vakuum

4.2 MOVING THE MACHINE TP2000

4.2.1 UNDERCARRIAGE OPERATION

- *Travelling in a straight line*
  Move both levers forwards to travel in a straight line.
  Pull both levers backwards to travel in reverse.

- *Steering to the right or left*
  To turn right, move the left lever forwards.
  To turn left, move the right lever forwards.

- *Turning on the spot*
  Move one lever forwards and the other lever backwards.

4.2.1.1 2ND TRAVEL SPEED

To engage the 2nd travel speed, shift the lever to the position shown. Use this control only when travelling on level and compact ground.

4.2.1.2 SWING FUNCTION

- To swing the load forwards, push the lever forwards.
- To swing the load backwards, pull the lever backwards.

4.2.1.3 LIFTING FUNCTION

- To lift the forks, pull the lever backwards.
- To lower the forks, push the lever forwards.

4.2.2 PRECAUTIONS FOR USE

WARNING

This forklift is not provided with a light unit, therefore it is forbidden to use it when visibility is scarce.

WARNING

Before starting the engine, make sure that all the distributor levers are in neutral position.

DANGER

Do not allow anyone in the area where the machine works and moves.

Operate the FORKLIFT TP2000 ONLY FROM THE CONTROL POSITION.

The FORKLIFT Hinowa TP2000 has been designed for handling palletized goods or boxes. The handled material must not weigh more than 2000Kg with a maximum distance of 500 mm between the centre of gravity of the load and the horizontal and vertical plane of the forks. The loads handled must be firm and compact, correctly positioned on standard pallets measuring 1000x1200mm or 800x1200mm, the maximum height of the load to be transported cannot exceed 1800mm (make sure that the centre of gravity of the load to be transported is at a maximum distance of 500mm from the horizontal and vertical plane of the forks).

The operator must always look in the direction of travel, in such a way as to check the route and avoid accidents. If transporting goods that hinder visibility, proceed in reverse; if this is not possible a second operator must walk before the forklift, keeping a safety distance, and the driver must proceed very slowly and stop the machine if he/she cannot see his/her colleague.
Make sure that the ground is firm enough to support the machine.
Take care to prevent the machine from overturning when you work on frozen ground. Increases in temperature soften the ground, making it unstable.
Before use, check that the carriage sliding and supporting area on the machine is free of debris or other material that may hinder its movement.

THE LOAD TO BE LIFTED CANNOT WEIGH MORE THAN 2000 KG AND THERE MUST BE A MAXIMUM DISTANCE OF 500 MM BETWEEN THE CENTRE OF GRAVITY OF THE LOAD AND THE HORIZONTAL AND VERTICAL PLANE OF THE FORKS.
IT IS FORBIDDEN TO EXCEED THE CAPACITY LIMIT AND THE INDICATED DISTANCE OF THE LOAD'S CENTRE OF GRAVITY FROM THE FORKS.

WARNING

AVOID OPERATING THE LOAD HANDLING LEVERS WHILE TRAVELLING.

4.2.2.1 DO NOT WORK IN DANGEROUS AREAS

DANGER

Due to specific manufacturing difficulties, the FORKLIFT TP2000 cannot be fitted with guards against the risk of material falling from above and the risk of overturning.
Make sure that in the working area there is no risk of overturning or of material falling from above.

4.2.2.2 HANDLING THE LOAD

Only pallets in perfect conditions and not exceeding the indicated dimensions can be loaded; the load must be compact and homogeneous and its weight and the distance of its centre of gravity from the forks must be as indicated.

Approach the load to be handled and brake smoothly in such a way as to stop the carriage near the load. Swing the forks forwards so that the mast is in vertical position.

WARNING

The forks must be swung forwards very slowly, to prevent the carriage from overturning and the load from sliding off the forks.

Move slowly forwards, taking care to avoid damaging the load and stop as soon as the end of the fork comes into contact with the load.
Check that the centre of gravity of the load is in the middle of the two fork tines.
Lift the load.
At this point swing the forks backwards, so that the load is as near the operator as possible.
Make sure that the way is free and proceed with the transport operation. Now drive carefully, accelerating and decelaring slowly and reducing speed in bends.

Note: **When travelling on slopes, the load must lead (be on the uphill side); it is absolutely forbidden to travel horizontally and to turn while the machine is moving uphill or downhill.**
Avoid parking or stopping the machine on slopes.

WARNING

When transporting particularly bulky loads, whose height exceeds the height of the control levers, pay the utmost attention to the position of your hands on the controls.
Any abrupt movement of the load may cause your upper limbs to be crushed between the distributor support and the load itself.

4.2.2.3 OPERATIONS ON SOFT GROUND

Avoid driving on very soft ground that is not hard enough to support the machine safely.
ALWAYS MAKE SURE THERE IS NO RISK OF OVERTURNING.
The machine is not fitted with a protective structure against overturning.

4.2.2.4 AVOID OPERATING ON SLOPES

Warning: manoeuvring on slopes is dangerous. Reduce travelling speed to avoid tilting or sliding.

Where possible, avoid turning on slopes. If it is necessary to turn on a slope, try to do this in an area with firm and reasonably level ground.
Avoid crossing inclines to prevent the danger of overturning.
Pay special attention when the gradient changes, travelling at the minimum possible speed.

4.2.2.5 PARKING AND STOPPING ON SLOPES

Warning: parking and stopping on slopes is very dangerous. If parking or stopping on a slope is unavoidable, take the following precautions:

1. **Always check that the ground is firm enough to ensure the stability of the machine.**

2. When stopping on a slope, even for a short period of time, place chocks underneath the tracks on the downhill side.

3. Before attempting to travel up an incline, make sure the gradient is not over 20° and that the engine and the hydraulic oil have warmed up sufficiently. Otherwise, the slow movement of the machine on a steep hill may cause problems.

4.3.2.6 TOWING THE MACHINE

IMPORTANT

The machine must not be towed.
Any attempt to tow the forklift may damage the transmission.

4.2.2.7 TRANSPORTING THE MACHINE

LOADING THE MACHINE ON A TRUCK WITH LOW BED.

Always load and unload the machine on a firm and level surface.

Warning: remember to use a ramp or a loading platform to load/unload the machine.

1. The ramps must be strong enough to support the weight of the machine. Make sure that the gradient of the ramp is less than 20°.
2. The ramps must be wide and strong enough and must have a suitable slope for the machine to drive on.
3. Before loading the machine, fully clean the ramp and the platform. Ramps or platforms that are dirty with oil, mud or ice are slippery and dangerous.

GRADIENT BELOW 20°

WARNING: during colder periods let the machine warm up before loading/unloading it.

ATTENTION:

1. **Avoid steering when driving up or down a ramp, as this is extremely dangerous. If steering is unavoidable, first return to the ground or the low loading platform, then change direction and start driving again.**
2. **Do not operate any lever other than the gear levers when driving up or down a ramp to prevent the machine from losing balance.**
3. **At the top end of the ramp, when the forklift reaches the bed of the truck, the gradient changes. Take care when driving over this section.**
4. Drive the machine slowly on the ramp.

5. The centre line of the machine must coincide with the centre line of the trailer.

IMPORTANT

Secure the chains or cables to the chassis of the machine. Never place the chains or cables over or against the hydraulic hoses.

6. Place chocks in front of and behind the tracks.
7. Secure all corners of the machine to the trailer with a chain or cable, using a suitable load securing device.

During transport, turn the fuel valve to position OFF and make sure that the engine remains level so as to avoid fuel leaks. Petrol fumes or leaks may catch fire.

PRECAUTIONS FOR TRANSPORTING THE MACHINE WITH RUBBER TRACKS

When transporting a machine with rubber tracks, remember to fasten the chassis of the right and left tracks securely to the floor of the truck, using metal cables and soft protectors.
Do not allow the metal cables to come into direct contact with the rubber tracks.

4.2.2.8 LIFTING THE MACHINE

To lift the machine correctly, observe the following safety precautions:
- The machine must not be carrying any load.
- Position the machine on a level surface.
- The operator must abandon the driving position when the machine is going to be lifted.
- Check that the work area is clear.
- Use sufficiently strong cables to support the weight of the machine as indicated on the CE plate.

LIFTING POINTS

There are two lifting points on the trucklift. Both are positioned on the upper part of the lifting guides.

4.2.2.9 USING THE RUBBER TRACKS

Avoid the following situations when working with an undercarriage with rubber tracks:

1. Do not manoeuvre the machine on hard, rocky and uneven surfaces, such as river stones, gravel, etc..
2. Do not leave the rubber tracks directly exposed to the sun for more than 3 months.
3. Where possible avoid improper steering operations on asphalt and concrete, as this will cause the tracks to wear out. In addition, avoid manoeuvring on bitumen roads when the surface temperature exceeds 60° C, as this causes wear on the tracks as well as damage to the road surface.
4. Manoeuvring with a loose track on an uneven surface may cause the detachment of and/or damage to the rubber track.
5. The rubber tracks are only for use on soft ground, and not on hard and abrasive surfaces such as sand, stones, minerals, etc. Using the rubber tracks on these surfaces may cause deformation and premature wear.
6. Prevent the rubber track from coming into contact with sharp concrete edges etc..
7. Rubber tracks must never come into contact with fuels or synthetic oils. If this does occur, however, immediately clean the track.
8. The rubber tracks should not be used near the sea, as the salty air or saline environments in general affect the adhesion between the rubber and the metal core.

5 MAINTENANCE

5.1 CORRECT INSPECTION AND MAINTENANCE PROCEDURES

- Learn how to perform correct maintenance on the trucklift and follow the inspection procedures as illustrated in this manual.
- Carry out the maintenance operations on solid and level ground.
- Never lubricate or grease nor carry out maintenance on the machine while it is on.
- Securely support the undercarriage if this needs to be lifted for maintenance work.
- Pay attention when carrying out maintenance on the hydraulic system, as the oil is very hot after work.
- There is high pressure in the circuits not only during but also after work.
- Keep all the components in good conditions and make sure they are correctly installed.
- Repair any damage immediately and replace any worn or broken parts.
- Remove any deposits of fat, oil or debris.
- Check that there are no oil leaks and/or damaged hydraulic pipes or hoses.
- Use the recommended lubricants. Do not mix together lubricants made by different manufacturers.
- Only use original **Hinowa** spare parts.
- Keep the grease nipples of the track tensioners and the pins of the hydraulic cylinders clean.
- The routine maintenance intervals refer to normal working conditions. If working in heavy-duty conditions, maintenance must be carried out more frequently.
- Dispose of the lubricants ecologically. Careless disposal of lubricants may harm the environment. Before disposing of the lubricants, refer to the local waste disposal legislation in force.
- Use suitable reservoirs when draining the lubricants. Do not use food or drink containers that someone may drink from by mistake.
  Do not pour the lubricants onto the ground, into the sewers or into puddles, canals or other water courses. Observe the laws in force on environmental protection when disposing of the lubricants.

5.2 HYDRAULIC SYSTEM

NO.			Qty.	INTERVAL			
				1 DAY	1 MONTH	3 MONTHS	1 YEAR
1	HYDRAULIC OIL	Check level		●			
		Change	l 35		*●		●
2	HYDRAULIC OIL FILTER	Change	1		*●	●	
3	TRAVEL AND ROTATION REDUCTION GEAR OIL	Check level				●	
		Change	l.0.5 EA.		*●		●

*** FIRST CHANGE**

5.2.1 HYDRAULIC OIL

Check

To check the hydraulic oil level, place the machine on a level surface and check that the oil level is around half way up the gauge **A**. If not, top up through the filler cap **B** positioned under the distributor guard.

Change

To change the hydraulic oil, proceed as follows:
- open the filler cap B positioned under the distributor guard;
- unscrew the drain plug C on the bottom of the tank;
- completely drain the oil contained in the tank. Carefully clean the tank before filling with new oil. Screw on the drain plug C and fill the tank through the filler cap B; do not mix oils made by different manufacturers.

To ensure unaltered performance of your forklift, only use HINOWA HYDRAULIC EP EXTRA oil.
The recommended filtering gauge is ß10 (>2).

5.2.2 HYDRAULIC OIL FILTER

Change

The hydraulic oil filter **D** is located at the top of the hydraulic oil tank, behind the distributor guard. Before opening the filter cover, remove the filler cap **B** (*see photograph Par. 5.3.1*) to avoid overpressurizing the tank.
To access this, after removing the distributor guard, remove the screws on the filter cover and replace the cartridge.

5.2.3 TRAVEL REDUCTION GEAR OIL

Checking the reduction gear oil level

The reduction gear oil level should be checked every 100 hours. Stop the reduction gear with the plugs aligned on the horizontal axis. Remove the plugs as shown in Fig. A and check that the oil level reaches the same height. If not, top up through one of the openings, using the other as level reference.

Changing the reduction gear oil

The oil should be changed for the first time after 100 hours of operation, and the following times every 1000 hours of operation. To change the oil, proceed as follows:
- stop the reduction gear with the plugs aligned vertically to the ground, as illustrated in Fig. B;
- remove both plugs and drain the oil completely;
- then position the reduction gear with the plugs aligned on the horizontal axis (Fig. A) and fill through one of the openings, using the other as level reference.

IMPORTANT

Avoid using different oils in terms of characteristics and brand.

Choosing the reduction gear oil

For the reduction gears, gear oils are recommended with EP additives, and viscosity grade ISO VG150 or SAE 80W/90.
In the event of significant variations in temperature, synthetic lubricants are recommended, with EP properties, minimum viscosity index 165 and viscosity grade VG150 and VG220.

	VG100	VG150	VG320	VG150-200
ISO 3448	-20°C +5°C IV 95min	+5°C +40°C IV 95min	+30°C +50°C IV 95min	-30°C +65°C IV 165min

In any case, the oils chosen should not be subject to rapid ageing at the corresponding operating temperatures. The continuous operating temperature must not exceed 90°C.

5.3 MAINTENANCE ON THE RUBBER TRACKS

5.3.1 CHECKING THE TRACK TENSION

Stop the machine on firm and level ground. Lift the machine and support it securely and safely by placing stable supports under the chassis of the undercarriage. At the centre roller on the undercarriage, measure the distance A of the bottom of the roller from the rigid inner part of the rubber tracks. The tension of the track is normal if A is between 10 and 15 mm.
If the tension of the track is not within the values specified above, too loose or too tight, follow the procedure illustrated in the paragraph below.

5.3.2 OPERATIONS FOR LOOSENING/TIGHTENING THE TRACK

The grease contained in the hydraulic track is under pressure. For this reason, do not loosen the grease valve 1 more than one turn; if the valve is too loose, the grease may be released due to pressure, placing the operator at risk. Never loosen the grease nipple 2.
When gravel or mud gets stuck between the cogwheel and the links of the track, remove it before loosening the track.

1. To loosen the track, slowly unscrew valve 1 anticlockwise, no more than one turn. One turn of valve 1 is sufficient to loosen the track.
2. If the grease does not start to be drained, rotate the track slowly.
3. When the right track tension has been found, turn valve 1 clockwise and tighten it. Remove all traces of grease.
4. To tighten the track, connect a grease gun to the grease nipple 2 and add grease until the tension of the track is within the specified values.

DANGER

It is not normal for the track to remain tight after valve 1 has been turned anti-clockwise, or for the track to be still loose after grease has been added through the grease nipple 2.In any case, never attempt to remove the tracks or disassemble the tensioner cylinder, as the pressure of the grease inside the track is very dangerous.

5.3.3 CHECKING THE RUBBER TRACKS

The structure of the rubber track is shown in Fig. A. The steel wires and the metal core are embedded in the rubber. The track grooves are designed to ensure stability when travelling on soft ground. These are located on the bottom part in contact with the ground, while the wheel guides inside the track prevent it from coming off the guide rollers.

Fig. A

Cause of damage

A) *Breakage of the steel wires*

Excessive tension will cause the steel wires to break under the following conditions:

- when stones or foreign matter accumulate between the track and the chassis of the undercarriage;

- when the track comes off its guide;
- in the event of considerable friction, such as rapid changes in direction.

B) *Wear and breakage of the metal cores*

As for the breakage of the steel wires described above, excessive tension may cause the metal cores to bend or break, together with one of the following causes:
- improper contact between the cogwheel and the track;
- rotation of the inside rollers;
- operation on sandy ground.

C) *Separation of the metal cores*
The metal core acts as the 'adhesive' for the rubber between the core itself and the steel wires.

Separation may be caused by excessive tension, as for the breakage of the wires, for the following reasons:
- the metal cores have been rolled up by the worn cogwheel as shown in the figure. When such wear and abrasions are found, the cogwheel must be replaced as soon as possible.
In the case of breakage as described in paragraphs A-B-C, the track must be replaced, as this damage causes a complete loss of operability.

D) *Abrasion and cracks due to fatigue*

1. Cracks at the base of the track patterns occur due to fatigue, since the rubber is bent by the cogwheel and the idler roller, as shown in photo 4 (see the appendix).

2. Cracks and bends on the edge of the rubber are due to the fact that the track is operated on curbs and sharp concrete edges.

3. Cracks and abrasion on the rubber along the line of the guide rollers are due to fatigue from the compression of the rubber by the weight of the wheel, together with operation on sandy ground, or repeated and sudden changes in direction, as shown in photos 6-8-9 (see the appendix).

4. Abrasion of the track patterns may be caused by rotation on concrete, gravel or

hard surfaces (see photo 7 in the appendix).

The damage described in paragraph D points 1, 2, 3 is not considered fatal for the track, and the track can continue to be used, even if with gradual and progressive damage.
The progression of the damage indicated in point 3 leads to the exposure of the metal cores, and if such exposure covers more than half of the circumference of the track, then the track should be replaced. It can in any case still be used.

E) *Cracks due to external factors*

Cracks on the outside surface of the track (the part in contact with the ground) are very often due to contact with gravel, sharp stones, sharp materials such as metal sheet, nails and glass, which cause cuts as shown in photo 10 (see the appendix). Considering the properties of rubber, this is unavoidable, even if it depends on the operating conditions.
Cracks on the inside surface of the circumference and on the edge of the rubber are due to the contact of the track with the structure of the undercarriage or with sharp concrete edges, as shown in photos 12 and 13 (see the appendix).
The increase in the extent of the cracks is relatively small.
Even if it seems in bad conditions, the track can still be used for heavy-duty applications.

5.3.4 REPLACING THE RUBBER TRACKS

DANGER

The grease contained in the hydraulic track is under pressure.
For this reason, do not loosen the grease valve 1 more than one turn; if the valve is too loose, the grease may be released due to pressure, placing the operator at risk.
Never loosen the grease nipple 2.
When gravel or mud gets stuck between the cogwheel and the links of the track, remove it before loosening the track.

Removing the rubber track

1. Stop the machine on firm and level ground, lift it and support it securely and safely.

2. To loosen the track, slowly unscrew valve 1 anticlockwise, giving it no more than one turn. One turn of valve 1 is sufficient to loosen the track.

3. If the grease does not start to be drained, slowly rotate the track.

4. Insert 3 steel tubes (4) into the track, in the space between the rollers. Turn the sprocket in reverse (5) so that the steel tubes move with the track and are caught in the idler roller.
   Exert lateral force (6) to slide the track and lift it up from the idler roller.

DANGER

Installing the rubber track

1. Before assembling the tracks, make sure that the lifted machine does not represent a danger and that the working conditions are safe.

2. Make sure that the grease contained in the hydraulic cylinder has been released.

3. Mesh the links of the track with the cogwheel and position the other end of the track on the idler roller.

4. Turn the sprocket (7) in reverse, pushing the bottom of the track inside the chassis (8).

5. Using a steel tube, position the track and turn the sprocket again.

6. Make sure that the links of the track are correctly meshed on the cogwheel and the idler roller.

7. Adjust the tension of the track (see paragraph 5.4.2 - *Operations for loosening/tightening the track*).

8. Rest the tracked undercarriage on the ground.

5.4 CHECKING THE TIGHTNESS OF NUTS AND BOLTS

The parts and the nuts and bolts that may become loose must be checked based on the use of the forklift.

Pay special care to the components of the chassis, such as the idler rollers, travel reduction gears, sprockets and guide rollers. Check tightness as per the following table.

Thread diameter mm	Distance between idler roller and sprocket mm	kgm
6	1	1,3 ± 0,15
8	1,25	3,2 ± 0,3
10	1,5	6,5 ± 0,6
12	1,75	11 ± 1
14	2	17,5 ± 2
16	2	27 ± 3
18	2,5	37 ± 4
20	2,5	53 ± 6
22	2,5	73 ± 8
24	3	92 ± 10
27	3	135 ± 15
30	3,5	184 ± 20

5.5 STORING THE MACHINE

1. Inspect the machine. Repair any worn or damaged parts. Install new parts where necessary.
2. Clean the filtering elements of the air filter.
3. Lubricate all the greasing points.
4. Place the tracks on stable blocks. Lubricate the pins of the track links with oil (except for rubber tracks).
5. Wash the machine.
6. To prevent rust, paint the parts where required.
7. Store the machine in a dry and protected place. If stored outdoors, cover with a tarpaulin.

Using the machine after storage

WARNING: only start the engine in a well-ventilated place.

1. Fill the fuel tank. Check all the fluid levels.
2. Start the engine and run at medium revs for a few minutes before starting work.
3. Operate all the hydraulic parts various times.
4. Carefully check the entire system before operating the machine with a full load.

6 TECHNICAL SPECIFICATIONS

6.1 TECHNICAL CHARACTERISTICS

UNDERCARRIAGE

Track width .....250 mm
Support rollers per side 5
Travel speed .....1,5 - 2,2 km/h

OPERATING WEIGHT

Operating weight excluding operator (fixed undercarriage) .....845 kg

PERFORMANCE

Gradeability .....20° (36,4%)
Capacity .....2000 kg
Max distance from the centre of gravity allowed .....500 mm
Max lifting height.....300 mm

Sound power level at operator's ear .....86 dB (A)
Measured sound power level .....102 dB (A)

Vibrations transmitted to the operator's hand/arm system during
normal off-road use of the machine (HAV) .....Aw 1,75 m/s^2
Vibrations transmitted to the operator's body as a whole during
normal off-road use of the machine (WBV) .....Aw 1,13 m/s^2

STANDARD FEATURES

- Second travel speed
- Non-slip platform

FORKLIFT TP2000

6.2 HYDRAULIC SYSTEM DIAGRAM

6.2.1 KEY TO THE HYDRAULIC SYSTEM DIAGRAM

1	-		**5**	-	Reduction gear, L track
2	-		**6**	-	Swing cylinders
3	-	Drain filter	**7**	-	Reduction gear, R track
4	-	Distributor HC-D9/5	**8**	-	Lifting cylinder

APPENDIX

PHOTO NO. 1

CUT STEEL WIRES

PHOTO NO. 2

ABRASION AND BREAKAGE OF THE STEEL CORES

PHOTO NO. 3

SEPARATION OF THE STEEL CORE

PHOTO NO. 4

BREAKAGE OF THE TRACK PATTERN CAUSED BY BENDING STRESS (CURVING) ON THE RUBBER

PHOTO NO. 5

BREAKAGE ON THE OUTSIDE PART OF THE RUBBER UNDER THE EDGE OF THE STEEL CORE

PHOTO NO. 6

BREAKAGE ON THE INSIDE PART OF THE RUBBER ON THE SIDE OF THE STEEL CORE

PHOTO NO. 7

ABRASION OF THE TRACK PATTERN

PHOTO NO. 8

ABRASION OF THE RUBBER DUE TO THE GUIDE WHEELS (INITIAL STAGE)

PHOTO NO. 9

ABRASION OF THE RUBBER DUE TO THE GUIDE WHEELS (FINAL STAGE)

PHOTO NO. 10

CUTS DUE TO SHARP MATERIAL ON THE OUTSIDE PART OF THE RUBBER

PHOTO NO. 11

BREAKAGE AND ABRASION ON THE OUTSIDE PART OF THE RUBBER CAUSED BY HARD GROUND

PHOTO NO. 12

CUT ON THE INSIDE EDGE OF THE RUBBER DUE TO SHARP MATERIALS OR HARD, SHARP EDGES

PHOTO NO. 13

BREAKAGE OF THE INSIDE PART OF THE RUBBER CAUSED BY CONTACT WITH THE UNDERCARRIAGE CHASSIS

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PT20GL/TP2000
16983500

- Catalogo ricambi
- Spare parts catalogue
- Catalogue pièces détachées
- Ersatzteilkatalog
- Catálogo repuestos
- Reserveonderdelen Catalogue

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Hinowa	CARRO CON CINGOLO IN GOMMA	WAGEN MIT GUMMIRAUPE	**PT20GL/TP2000/ 16983500**
	CARRIAGE WITH RUBBER TRACK	CARRO CON ORUGA DE GOMA	
	TRAIN DE ROULEMENT CHENILLE EN CAOUTCHOUC	ONDERSTEL MET RUBBEREN RUPSBAND	**01.01.00** / **Ed.07.2017**

Tav. **01.01.00**	**Carro con cingolo in gomma**	**Wagen mit Gummiraupe**
	Carriage with rubber track	**Carro con oruga de goma Te**
	Train de roulement chenille en caoutchouc	**verbreOnderstel met rubberen rupsband**

Pos.	Cod.	Q.tà	Descrizione	Description	Designation	Benennung	Descripción	Beschrijving
01	04445700	02	Cingolo in gomma	Rubber track	Chenille en caoutchoue	Gummiketten	Oruga de goma	Rubberen rupsband
02	147306Y1	02	Supporto tendicingolo completo	Complete idler support	Support tendeur de chenille complet	Halterung der Raupens pannvorr - komplett	Soporte tensor oruga completo	Complete steun rupsbandspanner
03	03149200	01	Valvola ingrassaggio	Greasing valve	Soupape graissage	Schmierungsventil	Valvula de engrase	Smeringsventiel
04	10681670	01	Cilindro tendicingolo	Idler cylinder	Cylindre tendeur de chenille	Raupenspann-zylinder	Cilindro tensor oruga	Cilinder rupsband - spanner
05	03024801	01	Molla	Spring	Ressort	Feder	Muelle	Veer
06	04635800	01	Piastra	Plate	Platine	Platte	Placa	Plaat
07	147307H2	02	Ruota tendicingolo completa	Complete idler wheel	Roue tendeur de chenille complète	Raupensparad komplett	Rueda tensor oruga completo	Compleet wiel rups-bandspanner
08	167934H2	10	Rullo inferiore completo	Carrier roller complete	Rouleau inférieur	Tragrolle komplett	Rodillo inferior	Compleet onderste rol
09	030253H2	02	Coperchio ispezione tendicingolo	Track tensioner inspection cover	Couvercle inspection rue de traction	Deckel für Spannket-teaufsicht	Tapa registro tensor cadena	Hubarbeitsbühne
10	04463500	02	Guida cingolo	Track's guide	Guidage chenille	Bahn für die Kette	Guia oruga	Onderstel begeleiding
11	14895700	02	Motoriduttore	Gear motor	Motoréducteur	Getriebemotor	Motorreductor orugas	Vertrangingsdrifwerk onderkankant
12	043042H2	02	Ruota trazione	Sprocket wheel	Roue de traction	Antriebsrad	Rueda de arrastre	Drijfwiel
13	03174501	02	Coperchio motoriduttore	Cover gear motor	Couvercle motoréduc - teur	Deckel Getriebemotor	Tapa Motorreductor	Deksel
14	37029800	01	Telaio carro	Undercarriage frame	Châssis chenillard	Rahmen des Fahrwerks	Bastidor carro	Onderstel frame
15	04535300	02	Boccola	Bush	Douille	Buchse	Casquillo	Bus

Hinowa	TORRETTA	OBERWAGEN	**PT20GL/TP2000/ 16983500**
	UPPER STRUCTURE	TORRETA	
	TOURELLE	TOREN	**02.01.00** **Ed.07.2017**

Tav. **02.01.00**	**Torretta**	**Oberwagen**
	Upper structure	**Torreta**
	Tourelle	**Toren**

Pos.	Cod.	Q.tà	Descrizione	Description	Designation	Benennung	Descripción	Beschrijving
01	06437100	02	Dente forche pallets	Pallet fork tooth	Dent de fourches de palettes	Palettengabelzahn	Diente horquillas paletas	Tand vorken
02	364404H2	01	Supporto forche pallets	Pallet fork support	Support fourches de palettes	Halterung	Soporte horquillas paletas	Halterung vorken pallets
03	05607200	04	Fermo forche	Retainer	Arrêt	Halterung	Sujetador	Blokkering
04	05653600	04	Cuscinetto	Bearing	Roulement	Lager	Cojinete	Lager
05	36440500	01	Guide forche	Pallet fork guides	Guidage fourches de palettes	Kastenaufbau - Führung	Guías horquillas paletas	Geleider
06	06441200	02	Tappo ferma guide	Cap	Bouchon	Verschluss	Tapón	Dop
07	06097800	02	Spina supporto guide	Pin	Cheville	Stift	Clavija	Stekker
08	068142Y1	02	Goccia spina	Pin drop	Baisse cheville	Tropfen Stift	Caída clavija	Drop stekker
09	06097700	04	Spina clindro brandeggio	Swivelling cylinder's pin	Tige du cylindre de la rotation de la flèche	Zylinderstift der Seitenschwenkung	Clavija cilindro movimi-ento lateral brazo	Pen cilinder zwenken
10	260880H2	02	Cilindro brandeggio	Cylinder	Cylinder	Zylinder	Cilindro	Cilinder
11	36928300	01	Supporto distributore	Distributor support	Support distributeur	Halt.des Steuergeräts	Suporte distribuidor	Steun distributeur
12	361750B1	01	Pedana	Footboard	Repose-piedes	Fussbrett	Tarima	Treeplank
13	06928600	01	Coperchio distributore	Distributor cover	Couvercle distributeur	Untersetzungsgetrie-besdeckel	Tapa distribuidor	Hydraulische verdeler deksel
14	06437800	01	Coperchio tubi	Cover	Couvercle	Deckel	Tapa	Deksel
15	05611800	01	Tappo olio	Oil plug	Bouchon d’huile	Ölstopfen	Tapón aceite	Oliedop
16	05061800	01	Livello olio	Oil level	Niveau huile	Ölniveau	Nivel aceite	Oliepei
17	26120000	01	Filtro olio idraulico completo	Complete filter Oil	Filtre a d'huile complete	Ölfilter komplett	Filtro aceite completo	Kompletet Oliefilter
18	04130500	01	Cartuccia filtro olio idraulico	Hydr. oil cartridge	Cartouche huile hydr.	Filtereinsatz	Cartucho aceite hidr.	Patroon hydr. olie
19	264372H2	01	Cilindro sollevamento	Lift cylinder	Cylindre de levage	Hubzylinder	Cilindro de elevación	Hefcilinder
20	06928700	01	Lamiera piegata	Folded plate	Tôle pliée	Blech gebogen	Chapa doblada	Plaatijzer gebogen

Hinowa	IMPIANTO ASPIRAZIONE E SCARICO SUCTION - DRAINING SYSTEM INSTALLATION ASPIRATION ET DÉCHARGE	VOR- UND RÜCKLAUFANLAGE INSTALACIÓN DE ASPIRACIÓN Y DESCARGA INSTALLATIE AFZUIGING EN AFVOER	**PT20GL/TP2000/ 16983500** **03.01.00** **Ed.07.2017**

Tav. **03.01.00**

Impianto aspirazione - scarico
Intake-draining system
Installation aspiration-évacuation
Hydraulik — Vor- und Rücklauf
Instalación de aspiración-descarga de aceite
Hydraulische installatie afzuiging-afvoer

Pos.	Cod.	Q.tà	Descrizione	Description	Designation	Benennung	Descripción	Beschrijving
01	07149200	03	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
02	06453600	01	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
03	06453700	02	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
04	06453100	01	Tubo rigido	Pipe	Tube rigide	Rohr	Tubo rígido	Stijve leiding
05	07149400	01	Tubo rigido	Pipe	Tube rigide	Rohr	Tubo rígido	Stijve leiding
06	26942100	01	Distributore idraulico	Aerial part hydraulic	Distributeur hydraulique	Hydraulischer Verteil	Distribuidor hidraulico	Heffend hydraulische

Hinowa	IMPIANTO IDRAULICO TRAZIONE HYDRAULIC SYSTEM FOR TRACTION SYSTÈME HYDRAULIQUE DE TRACTION	HYDRAULIKANLAGE ANTRIEB INSTALACIÓN HIDRÁULICA TRACCIÓN HYDRAULISCHE AANDRIJFINSTALLATIE	**PT20GL/TP2000/ 16983500** **04.01.00** **Ed.07.2017**

Tav. **04.01.00**

Impianto idraulico trazione | **Hydraulikanlage Antrieb**

Hydraulic system for traction | **Instalación hidráulica tracción**

Syst ème hydraulique de traction | **Hydraulische aandrijfinstallatie**

Pos.	Cod.	Q.tà	Descrizione	Description	Designation	Benennung	Descripción	Beschrijving
01	06154300	04	Leva tipo tondo	Lever	Levier	Hebel	Palanca	Hendel
02	06154200	02	Leva ergonomica	Lever	Levier	Hebel	Palanca	Hendel
03	06453900	02	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
04	06453000	04	Tubo rigido	Pipe rigid	Pipe rigid	Rohr	Tubo rígido	Stijve leiding
05	06454000	01	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
06	06453500	02	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
07	06453400	02	Tubo flessibile	Flexible pipe	Tuyau souple	Schlauch	Tubo flexible	Slang
08	05004400	02	Raccordo 3/8 12L H=20	Fitting 3/8 12L H=20	Raccord 3/8 12L H=20	Anschluss 3/8 12L H=20	Conexión3/8 12L H=20	Verbinding 3/8 12L H=20

INSTRUCTION BOOK

HATZ DIESEL

INCLUDES SUPPLEMENTAL INFORMATION TO THE OWNER'S MANUAL FOR 2008 AND LATER EPA CERTIFIED NONROAD COMPRESSION-IGNITION ENGINES

INCLUDES SUPPLEMENTAL INFORMATION TO THE OWNER'S MANUAL FOR 2008 AND LATER CALIFORNIA REGULATIONS FOR HEAVY-DUTY OFF-ROAD ENGINES

1D 41.
1D 50.
1D 81.
1D 90.

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33

A new HATZ diesel engine is ready to work for you

This engine is intended only for the purpose determined and tested by the manufacturer of the equipment in which it is installed. Using it in any other manner contravenes the intended purpose. For danger and damage due to this, Motorenfabrik HATZ assumes no liability. The risk is with the user only. Use of this engine in the intended manner presupposes compliance with the maintenance and repair instructions laid down for it. Noncompliance leads to engine breakdown.

Please study this Instruction Book before you start the engine for the first time: it will help you to avoid accidents, to operate the engine correctly, to perform maintenance work and to keep the engine operating at full efficiency for a very long time.

Please follow all maintenance references carefully including the schedule for 2008 and later EPA certified nonroad compression-ignition engines and for 2008 and later CARB certified Heavy-Duty off-road engines to prevent our environment.

Please pass this Instruction Manual on to the next user or to the following engine owner.

HATZ DIESEL SERVICE

Throughout the world, a network of HATZ service stations is at your disposal for advice, spare parts supply and maintenance or repair work.
Please refer to the enclosed list for the address of your nearest HATZ service point.

HATZ DIESEL

Original - Ersatzteile
Original-spare parts
Pièces de rechange d'origine
Repuestos originales

Please use only genuine HATZ spare parts. Only these parts guarantee a perfect dimensional stability and quality. Their order numbers are shown in the enclosed Parts List. Please note the complete spare part kits in Table M00 of the list.

In the interests of technical progress we reserve the right to introduce modifications.

MOTORENFABRIK HATZ GMBH & CO KG

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This symbol draws attention to important safety precautions.
Please comply with them most carefully in order to avoid any risk of injury to persons or damage to materials.
General legal requirements or safety regulations issued by the competent authorities or industrial accident insurers are also applicable.

1. Important notes on safe operation of the engine

HATZ diesel engines are economical, strongly built and long-lasting. They are therefore frequently chosen for commercially and industrially operated equipment and machinery.
Since the engine forms part of the finished equipment or machine, its manufacturer will take all the applicable safety regulations into account.
Nevertheless, we give below certain additional comments on operating safety, and would recommend you to note them carefully.
Depending on the manner in which the engine is installed and its intended application, the equipment manufacturer or operator may have to attach additional safety devices and prohibit potentially hazardous aspects of operation, for example:

– Parts of the exhaust system as well as the surface of the engine are of course hot during operation of the engine, but also when it is still cooling down after use, and must not be touched.

– Faulty wiring or incorrect operation of electrical equipment may lead to sparks forming, and must be avoided as a potential fire hazard.

– Rotating parts must be shielded against accidental contact when the engine is installed in other equipment or machinery.
  Guards are available from HATZ to protect belt drives, cooling fans and generators.

– Before attempting to start the engine it is essential to have studied the starting information in the Instruction Book; this is particularly important on engines started with a starting handle.

– Mechanical starting devices must not be used by children or persons of insufficient physical strength.

– In order to benefit from the advantages of the starting handle with kick-back damping, it must be used precisely as recommended in this Instruction Book.

– Before starting the engine, ensure that all the specified protective guards are in place.

– The engine must only be operated, serviced or repaired by persons who have received the appropriate training.

– Keep the starting handle and the key out of reach of unauthorized persons.

– Never run the engine in closed or badly ventilated rooms.
  Do not breath in emissions - danger of poisoning!

– Also fuel and lubricants could contain poisonous components. Please follow the instructions of the mineral oil producer.

Important notes on safe operation of the engine

– Stop the engine before performing any maintenance, cleaning- and repair work.

– Stop the engine before refuelling.
  Never add fuel near a naked flame or a source of sparks.
  Don't smoke. Don't spill fuel.

– Keep explosive materials as well as flammable materials away from the engine because the exhaust gets very hot during operation.

– Wear close-fitting clothing when working on a running engine.
  Please don't wear necklaces, bracelets or any other things which you could get caught with.

– Please pay attention to all advice- and warning stickers placed on the engine and keep them in legible condition. Contact your next **HATZ service station**, if a sticker comes off or is illegible and ask for a new one.

– Note that any unauthorized modification to the engine absolves its manufacturer from liability for the consequences.

Regular servicing in accordance with the details provided in this Instruction Book is essential to keep the operating reliably and to ensure the exhaust quality of the engine.

In case of doubt, always consult your nearest **HATZ service station** before starting the engine.

2. Description of engine

1D41 • 1D50 • 1D81 • 1D90 S / Z engines

1

1 Cooling air inlet
2 Dry-type air cleaner
3 Decompression lever
4 Stop lever
5 Cooling air outlet
6 Silencer (muffler)
7 Guide sleeve for starting handle
8 Cylinder head cover
9 Cold-start oil metering device
10 Suspension lug
11 Tank filler cap
12 Oil drain plug, governor housing
13 Oil drain plug, governor side
14 Speed control lever
15 Oil filler pipe and dipstick
16 Fuel filter
17 Oil filter
18 Type plate
19 Tank drain plug
20 Combustion air intake

Fully-encapsulated version
1D41C • 1D81C engines

2

1 Capsule
2 Decompression lever
3 Cold-start oil metering device
4 Combustion and cooling air intake
5 Oil filter
6 Cleaning hatch
7 Side panels
8 Hold for starting handle
9 Suspension lug
10 Silencer (muffler), encapsul.
11 Cooling air outlet
12 Battery connection and central plug for electrical system
13 Stop lever
14 Speed control lever
15 Oil drain plug
16 Oil filler and dipstick
17 Type plate

3. General information

3.1. Technical data

Type		1D41.	1D50.	1D81.	1D90.
Engine models		S, Z, C	S, Z	S, Z, C	S, Z
Mode of operation		air-cooled four-stroke diesel engine			
Combustion method		Direct-fuel injection			
Number of cylinders		1	1	1	1
Bore / stroke	mm	90/65	97/70	100/85	104/85
Displacement	cm³	413	517	667	722
Engine oil content without filter with filter	approx. L approx. L	1.1 1) 1.2 1)	1.4 1) 1.5 1)	1.8 1) 1.9 1)	1.8 1) 1.9 1)
Volume of oil between „max“ and „min“ marks	approx. L	0.4 1)	0.5 1)	0.9 1)	0.9 1)
Consumption of lubrication oil after running-in period		approx. 1 % of fuel consumption at full load			
Engine oil pressure Oil termperature 100 ± 20 °C		min. 0.6 bar at 850 r.p.m.			
Direction of rotation looking at the flywheel		counterclockwise			
Valve clearance at 10 - 30 °C Inlet Exhaust	 mm mm	 0.20 0.20	 0.10 0.20	 0.10 0.20	 0.30 0.30
Max. angle from vertical in any direction (continuous operation)	max.	30° 2)	30° 2)	30° 2)	30° 2)
Weight (incl. fuel tank, air-cleaner, exhaust silencer and electric starter) Engine model S Engine model Z Engine model C	 approx. kg approx. kg approx. kg	 75 77 96.5	 76 78 –	 89 91 121	 90 92

Model **S:** non-encapsulated, normal system of balancing
Z: non-encapsulated, add. system of balancing
C: SILENT PACK, add. system of balancing

1) These data are approx.-values. The **max.** mark on oil dipstick counts.

2) Exceeding these limits causes engine breakdown.

3.2. Transport

A lug is provided on top of the engine as standard equipment, so that the engine and its auxiliaries can be lifted safely. It is not suitable for lifting complete machines or similar with the engine attached, and this is strictly prohibited. (See Chapter 2.)

3.3. Instructions for installation

The „Manual for Selection and Installation of Engines“ contains all the information you need if your engine has not yet been installed on or in the equipment it is intended to drive, or set up in its correct operating position. You can obtain a copy of this manual from your nearest HATZ service station.

3

The permitted loads and elements on the speed adjusting lever and the stop lever should be observed as an exess can lead to damage to the contacts and inner governor parts.

3.4. Load on engine

See supplemental information for EPA certified engines, Page 35; resp. supplemental information for California regulations for off road engines, Page 51.

3.5. EPA/CARB-type plates and fuel label

There are two EPA/CARB- type plates applied for the identification of the engine. The type plates are placed on the crankcase resp. on the capsule (chapt. 2).
They include the following emission control information (Figure 4a):

Label 1/2

4a

① EPA/CARB-Engine Family Number
② engine type/spec. (only for special equipment) /Fuel Delivery Timing
③ engine number
④ max. engine rated speed
⑤ build date
⑥ displacement
⑦ rated power
⑧ “constant speed only” (if requested)
⑨ “variable speed” (if requested)

Every engine is equipped with an additional loose engine type plate. If the original type plate on the engine is not readily visible after the engine is installed in the equipment then the second loose type plate must be attached on the equipment in such a manner that it is readily visible to an average person.

The layout is identical for constant-speed and variable speed application.

For any offer as well as spare parts orders it is necessary to mention the following data (also see spare parts list, page 1):

② engine type/spec.
(only for special equipment)
③ engine number
④ max. engine rated speed

Attention:
If the engine was certified for constant-speed application and shall be used so, the field "constant-speed only" is marked with “X”.
If the engine was certified for variable speed application and shall be used so, the field "variable speed" is marked with “X”.

Always install the engine for its intended application in order to comply with EPA and CARB emission regulation requirements.

Label 2/2

4b

The engine must be operated with “LOW SULFUR FUEL OR ULTRA LOW SULFUR FUEL ONLY”.
The label also states the applicable emission-related power category of the engine.

Fuel label

4c

The fuel label is placed nearby the fuel inlet.
If there was no fuel tank mounted to the engine, the label has to be permanently attached to the equipment near the fuel inlet.

3.6. EMISSION-RELATED INSTALLATION INSTRUCTIONS

See supplemental information for EPA certified engines, Page 35; resp. supplemental information for California regulations for off road engines, Page 51.

4. Operation

4.1. Before initial start-up

Engines are normally delivered without fuel and oil.

4.1.1. Engine oil

Qualified are all trademark oils which fulfil at least one of the following specifications:

ACEA – B2 / E2 or more significant
API – CD / CE / CF / CF-4 / CG-4 or more significant.

If engine oil of a poorer quality is used, reduce oil change intervals to 150 hours of operation.

Oil viscosity

5

Choose a viscosity according to the ambient temperatures where the engine is to be started from cold.

The engine must be in a horizontal position before adding oil or checking the oil level.

6

– Pull out dipstick „1“ and add engine oil of the correct specification and viscosity up to the **„max“ mark** on the dipstick; (Chapter 3.1.).

4.1.2. Oilbath air cleaner

7

– Take off the oil reservoir and fill it up to the mark „1“ using engine oil.

– Attach the oil reservoir, making sure that sealing ring „2“ is correctly seated and catches „3“ are tight.

4.1.3. Fuel

Only refuel when engine is stopped. Never refuel close to open flames or flammable sparks, don't smoke. Use only pure fuel and clean replenishing cups. Don't spill the fuel.

All diesel fuels sold as fuel and complying with the following minimum specification can be used:

EN 590 or
BS 2869 A1 / A2 or
ASTM D 975 - 1D / 2D

8

– Before the first start or if the fuel tank has been run dry, completely fill the fuel tank with diesel.
  The fuel system is bled automatically if the fuel tank is attached to the engine or located higher than the injection pump.

9

– If the fuel tank is not mounted on top of the engine, or is at a lower level, operate the lever on the fuel feed pump until fuel is heard to flow back to the tank through the return line.

10

– On fully encapsulated engines, move sleeve „1“ to one side to gain access to the feed pump.
  After operating the feed pump, make sure that the sleeve is replaced correctly and makes a good seal.

At temperatures below 0 °C, winter-grade fuel should be used or parafin added to the fuel well in advance.

Lowest ambient temperature when starting, in °C	Paraffin content for:	
	Summer fuel	Winter fuel
0 up to –10	20 %	–
–10 up to –15	30 %	–
–15 up to –20	50 %	20 %
–20 up to –30	–	50 %

4.1.4. Mechanical oil pressure monitor (optional extra)

The mechanical oil pressure monitor should be activated:

- when first filling, or after running the fuel tank dry.
- if engine shut down automatically because lubricating oil supply was inadequate.
- after freeing it by turning at low temperatures (Chapter 4.2.4.)
- after replacing the fuel filter, Chapter 5.4.1.

– Add fuel, chap. 4.1.3.

– Check engine oil level, chap. 5.2.1.

11

– To activate the monitor, press lever „1“ for approx. 15 seconds.

12

– If the engine has a full capsule, press pin „1“ for app. 15 seconds.

– If the engine has a fuel feed pump, operate its lever for several strokes at the same time (Figs. 9 and 10).

– Re-assemble all parts repositioned or removed. Check that capsule elements make a good seal.

13

Instructions to activate the mechanical oil pressure control are mentioned on the sticker placed on the engine.

IMPORTANT !
Even with mechanical oil pressure monitoring the oil level must be checked every 8 – 15 operating hours (Chapter 5.2.1.).

4.2. Starting the engine

Do not run the engine in closed or badly ventilated rooms – danger of poisoning ! Before the engine is started, always make sure that nobody is in the danger area (moving parts on engine or machinery) and that all safety guards are in place.

Check that the starting handle is in good condition: renew tubular grip if broken, worn drive pin etc.
Lightly grease the sliding-contact area between the starting handle and the guide sleeve.

14

Never use any spray starting aids.

4.2.1. Preparations for starting

– If possible, disengage the engine from any driven equipment. The auxiliary equipment should always be placed in neutral.

15

– Set speed control lever „1“ to a position between 1/2 START and max. START, according to requirements. Selecting a lower engine speed will reduce smoke when starting.

– Make sure that stop lever „2“ - if fitted - is in the operating „START“ position.

16

17

– Turn the decompression lever until stop „1“ is reached. In this position the automatic decompression system is heard to engage and the engine can then be started; Figs. 16 and 17.

18

After the automatic decompression device has engaged at its limit stop, five turns of the crank handle are needed for the engine to build up compression and fire again.

4.2.2. Starting with the handle

For preparations to start the engine, see Chapter 4.2.1.

19

For correct position to adopt when starting the engine, see Fig. 19.

– Take hold of the starting handle with both hands and turn it at increasing speed. The maximum speed of rotation must have been reached by the time the decompression lever has returned to the „0“ position (compression). As soon as the engine has started, pull the starting handle out of the guide sleeve.

– If the engine backfires because the crank handle was not turned firmly enough (the engine may even start to run backwards), release the crank handle immediately and stop the engine (Chapter 4.3.).

There is a risk of injury from the rotating crank handle.

– To restart the engine, wait until it has come to a standstill, then repeat the starting preparations.

Safety precaution
For greater protection against accidental injury when starting with the handle, a handle with kick-back damping can be used.

4.2.3. Starting with the handle with kick-back damping (retrofit)

For preparations to start the engine, see Chapter 4.2.1.

– For correct position to adopt when starting the engine, see Fig. 19.

20

– Always hold tubular grip „1“ with both hands.

– Turn the handle slowly until the pawl engages in the ratchet, then increase turning force to build up speed. The highest speed must have been reached when the decompression lever returns to the „0“ position (compression). As soon as the engine has started, pull the starting handle out of the guide sleeve.

You must hold the tubular grip firmly to maintain contact all the time between the starting handle and the engine. Maintain turning force during the entire hand starting operation.

If backfiring occurs when starting the engine because the crank handle was not turned firmly enough, the brief reverse rotation at the handle tube separates the link between crank lug „2“ and driving dog „3“ (Fig. 20).

– If the engine begins to run backwards after backfiring (smoke emerges from air cleaner), release the crank handle immediately and stop the engine (Chapter 4.3.).

– To restart the engine, wait until it has come to a standstill, then repeat the starting preparations.

4.2.4. Starting in cold weather

At temperatures below app. –5 °C, always turn the engine over to ensure that it rotates freely.

– Move the speed control lever to the START position; Fig. 15.

– Move the decompression lever to a position not as far round as starting position „1“ (Figures 16 and 17).

– Turn the engine over with the starting handle until it is felt to rotate more freely (10 – 20 turns of the starting handle).

– If mechanical oil pressure monitoring is fitted, press lever „1“ or pin „1“ in for about 15 seconds (Figs. 11 and 12).

21

22

– Remove dirt from the cover of the metering device and the surrounding area. Pull off the cover; Figs. 21 and 22.

– Add a free-flowing lubricating oil to the housing until the level reaches the upper rim. Replace the cover and press it in firmly. Two filling operations in succession are needed.

– Turn the decompression lever until limit stop „1“ (fig. 16 and 17).

– After this, start the engine immediately. Chap. 4.2.1. / 4.2.2. / 4.2.3.

4.2.5. Electric starter

For preparations to start, see Chapter 4.2.1.

– The decompression lever remains in pos. „0“.

Starting procedure

23

– Insert the key **to its stop** and turn it to **position I**.

– Battery charge telltale „2“ and oil pressure warning „3“ must light up.

– Turn start key to **position II** (fig. 23).

– As soon as the engine runs, release the start key. It must return to **position I** by itself and remain in this position during operation.
The battery charge telltale and oil pressure warning must go out immediately after starting. Indicator light „1“ is on when the engine is in operation.

– If anything seems to be incorrect, stop the engine immediately and trace and rectify the fault (chapt. 6).

– The engine temperature display „4“ (additional equipment) lights up if the temperature at the cylinder head becomes too high.
Switch off the engine and trace and eliminate the cause of the problem, chap. 6.

– Always turn the start key back to **position 0** before re-starting the engine. The repeat lock in the ignition lock prevents the starter motor from engaging and possibly being damaged while the engine is still running.

⚠ **Never operate the electric starter when the engine is running or coasting to a standstill. There is a risk of broken starter pinion or ring gear teeth.**

Important:
If a start protection module is installed, the start key has to be returned to **position 0** for at least 8 seconds if the engine has failed to start before a further attempt to start the engine can be made.

Preheating device with automatic heating timer (additional equipment)

The preheating light „5“ lights up additionally at temperatures below 0° Celsius (Fig. 23).

– After the light has gone out, start the engine without delay.

Automatic electrical shutdown system

(additional equipment)

This is characterized by a brief flashing of all pilot lamps once the starter key has been turned to **position I** (Fig. 23).

Important!
If the engine cuts out immediately after starting or switches off by itself during operation, a monitoring element in the automatic shutdown system has tripped. The corresponding indicator light (Fig. 23, positions 2 - 4) will come on.
After the engine has stopped, the display continues to glow for about 12 seconds.
The electrical device then switches itself off automatically.
The display lights up again after the start key has been turned back to **position 0** and then to **position I** again.
Trace and eliminate the cause of the operating fault before trying to restart the engine
(see chapter 6).

The display light goes out when the engine is next started.

Even with automatic shutdown monitoring the oil level must be checked every 8 – 15 operating hours (Chapter 5.2.1.).

4.3. Stopping the engine

Never stop the engine by moving the decompression lever. During breaks in work or at the conclusion of the working period, keep the starting handle and starting key in a safe place, out of reach of unauthorized persons.

24

– Move speed control lever „1“ back to the STOP position.

– On engines with the lower engine speeds not accessible, move speed control lever „1“ back, then move stop lever „2“ in the STOP direction. Hold it there until the engine has stopped.

– Release the stop lever „2“ when the engine has stopped, making sure that the lever returns to its normal operating position.

Electrical system

25

The charge „2“ and oil pressure telltales „3“ come on.

– Turn the key to the **0 position** and pull it out. The telltale lights must then go out.

Note:
Engines with an automatic electrical shutdown system (Chapter. 4.2.5.) can also be switched off by turning the start key back to **position 0.**

5. Maintenance

The engine must be stopped before any maintenance work is attempted.
Comply with legal requirements when handling and disposing of old oil, filters and cleaning materials.
Keep the engine's starting key and starting handle out of reach of unauthorized persons.
To immobilize engines with an electric starter, disconnect the negative battery terminal.
At the end of the maintenance work, check that all tools have been removed from the engine and all safety guards, covers etc. replaced in their correct positions.
Before starting the engine, make sure that nobody is in the danger area (engine or driven machinery).

5.1. Maintenance summary

	Maintenace intervals	Maintenance work required	Chap.
8-15	Every 8 – 15 operating hours or before daily starting.	Check oil level. Check area round combustion air input. Check the air cleaner maintenance indicator. Check the cooling air zone. Check the water trap. Check the lower part of the oilbath air cleaner for correct oil level and freedom from dirt; renew oil if sludge has formed.	5.2.1. 5.2.2. 5.2.3. 5.2.4. 5.2.5. 4.1.2. 5.3.1.
250	Every 250 operating hours	Maintenance of oil bath air filter. Replace engine oil and oil filter. Check and adjust tappet clearance. Clean cooling air system. Examine screw connections. Cleaning mesh insert in exhaust silencer	5.3.1. 5.3.2. 5.3.3. 5.3.4. 5.3.5. 5.3.6.
500	Every 500 operating-hours	Replace fuel filter. Maintenance of dry-air filter.	5.4.1. 5.4.2

26

The above maintenance chart is supplied with every engine. This label should be affixed to the engine or equipment in an easily visible position. The maintenance chart governs the maintenance intervals.

For **new** or **reconditioned** engines, the following must always be carried out after **first 25 operating hours:**

– Replace engine oil and oil filter, chap. 5.3.2.

– Check tappet clearance, and adjust if necessary, chap. 5.3.3.

– Examine screw connections, chap. 5.3.5.
Do not tighten the cylinder head fastening.

For short operating periods: replace engine oil and oil filter **after 12 months at the latest,** regardless of the number of operating hours.

5.2. Maintenance every 8 – 15 hours of operation

5.2.1. Check engine oil level

When checking the oil level, the engine should be standing level, and must not be running.

– Remove any dirt in the dipstick area.

27

– Check oil level at the dipstick; top up if necessary as far as the „max“ mark (see Chapter 4.1.1.).

5.2.2. Check air intake point

Severe contamination is a sign that there are large amounts of dust in the atmosphere and the air cleaner maintenance intervals should be reduced.

– Depending on the air intake pattern, check for severe blockage; clean if necessary (see Chapter 2).

28

– Check that dust outlet „1“ on the centrifugal dust trap (depending on version) is not blocked, and clean if necessary.

5.2.3. Air cleaner blockage indicator

(optional extra)

– Run the engine at full speed shortly.

29

If the rubber bellows is pulled in and obscures the green zone „1“, maintenance work is due on the air cleaner; Chapt. 5.4.2. In dusty operating conditions, check the rubber bellows several times a day.

5.2.4. Checking cooling air zone

Severe contamination is a sign that there are large amounts of dust in the atmosphere and that maintenance intervals should be reduced.

– Check the air inlet and outlet zones for blockage by coarse material such as leaves, large amounts of dust etc., and clean if necessary (see chapters 2 and 5.3.4.).

– If a temperature warning light „4“ is provided, it will come on if the engine overheats, fig. 25. **In this case, stop the engine immediately** (Chapter 4.3. and 5.3.4.).

5.2.5. Checking the water trap

The intervals at which you should check the water trap depend entirely on the amount of water in the fuel and the care taken when refuelling. The normal interval is once a week.

30

– Loosen hexagon screw „1“ with approx. 2-3 rotations.

– Trap the drops which emerge in a transparent vessel. Since water has a greater specific gravity than diesel fuel, the water emerges before the diesel fuel. The two substances separate at a clearly visible line.

– As soon as diesel only emerges at screw „1“, this can be tightened again.

If an external water trap is attached, check its water content every day, when the engine oil level is checked. The water which has collected is separated at a clearly visible line from the diesel fuel above it.

31

– Open drain plug „1“ and drain the water out into a suitable vessel.

– If the drain plug is difficult to reach, an extension hose can be attached to it.

5.3. Maintenance every 250 hours of operation

5.3.1. Oilbath air cleaner maintenance

32

Catch waste oil and dispase acc. to environmental regulations.

– Take off the oil reservoir „1“ and clean it.

– Remove contaminated oil and sludge from the oil tank, and clean it out.

– Take off rain cap „2“ and clean it.

– Clean the entire length of intake pipe „3“.

– Check the inserted seal and renew if in poor condition.

– Fill the oil reservoir up to the mark with engine oil and re-assemble the oilbath air cleaner, Chap. 4.1.2.

– If the filter pack is very dirty, also clean the upper part of the air cleaner as follows: Remove the upper part of the air cleaner from the engine and rinse it in diesel oil.

– Before re-assembling the air cleaner, allow the diesel fuel to drip off thoroughly, or wipe it off.

– Never attempt any repairs (welding, brazing etc.) to the oilbath air cleaner, or it may be rendered useless and the engine may also be damaged.

– If the sealing face is uneven, the air cleaner body cracked and/or the filter wool content is incomplete, install a new air cleaner.

– Attach the upper part of the air cleaner with a new flange gasket.

33

– Sealing package acc. picture 33 is mounted at engines 1D41 and 1D50.

34

– Shim washers „1“ should be installed with the convex side (outward curve) towards the nut.

– Re-assemble the complete air cleaner and fill it with oil to make it ready for further operation.

5.3.2. Changing engine oil, renewing oil filter

The engine must be stopped, and should stand on a flat, level surface.
Drain the engine oil only when it is warm.
For oil drain plug, see Chapter 2.

Risk of scalding from hot oil.
Catch waste oil and dispase acc. to environmental regulations.

– Unscrew the oil drain plug and allow all the oil to drain out.

Fully encapsulated engines:

35

When unscrewing oil drain plug „1“, make sure that the drain tube is not loosened. Prevent it from turning if necessary with an open-ended wrench of the correct size.

– Clean the oil drain plug and attach a new seal. Insert and tighten the plug.

36

– Renew the replaceable lubricating oil filter element.

37

– Clean sieve bottom carefully in order not to bend the netting.
Wipe out cap screw or blow it out with compressed air.

Persons handling compressed air must wear protective goggles.

Important !
Note the „TOP“ mark on the oil filter. Fig. 36

– Check condition of O-ring „1“ and renew it if necessary (Fig. 36).

– Wet the thread and the O-ring of the screw plug with lubricant „K“ (see spare parts list).

– Add engine oil up to the „MAX“ mark on the dipstick (see Chapter 4.1.1.)

– Run the engine for a short period, then check the oil level again and top up if necessary.

– Check that there is no leakage past screw plug on the oil filter housing.

5.3.3. Checking and adjusting valve clearances

– Move the decompression lever to **position „0“**; Fig. 16 and 17.

1D41 C, 1D81 C and 1D90 C engines
Take off the enclosure cover (see Chap. 2).
On engines with manual starting only, the decompression lever is also taken off when the cover is removed.

38

– Unscrew cover „1“ and take off together with gasket „2“. Never re-use this gasket.

– Turn the engine over in the normal direction of rotation until compression is felt.

39

– Check valve clearances between rocker and valve stem, using feeler gauge „1“; Fig. 39 (see Chapter 3.1.).

– If valve clearance is incorrect, slacken off hex. nut „2“.

– Turn adjusting screw „3“ with a screwdriver until feeler gauge „1” can just be pulled through between the rocker and the valve stem with slight resistance to its movement after nut „2“ has been retightened.

– Attach the cover at the cylinder head again and tighten down uniformly.

– Depending on version mount parts of air duct.

– Run the engine briefly and check that the cover is not leaking.

5.3.4. Clean the cooling air system

Before cleaning, the engine must be stopped and allowed to cool down.

Remove parts of air duct.

Dry contamination

– Clean all air guide elements and the complete cooling air zones on the cylinder head, cylinder and flywheel blades without making them wet. Blow them dry with compressed air.

Persons handling compressed air must wear protective goggles.

Moist or oily contamination

– Disconnect the battery. Clean the complete area with a solvent, cold cleaner etc. according to its manufacturer's instructions, then spray down with a powerful water jet.
  Do not splash electrical device with water jet or pressure jet during engine cleaning.

– Trace the cause of any contamination with oil and have the leak eliminated by a HATZ service station.

– Install the air guide elements previously removed.

The engine must never be run without the air guide elements in position.

– Immediately after re-assembly, run the engine until warm to prevent residual moisture from causing rust.

5.3.5. Checking threaded connections

Check the condition and tightness of all threaded connections, wiring, hose clips and other components attached to the engine and its mountings, provided that these can be reached during maintenance work.
Do not tighten the cylinder head bolts.

40

Adjustment screws on speed governor and injection system are painted with safty lacquer. Do not tighten or adjust them.

5.3.6. Cleaning mesh insert in exhaust silencer (additional equipment)

41

– Remove deposits from the mesh insert with a suitable wire brush.

5.4. Maintenance every 500 hours of operation

5.4.1. Renewing fuel filter

Fuel filter maintenance intervals depend on the purity of the fuel used; reduce them to 250 hours of operation if necessary.

Do not smoke or bring a naked flame near the fuel system when working on it.

Important!
Keep the entire area clean so that no dirt reaches the fuel. Fuel particles may damage the injection system.

42

– Shut off the fuel supply line **upstream and downstream of the fuel filter** according to item 1.

43

– Unscrew the fuel filter from its mount.

44

– Place a suitable vessel under the filter to trap escaping fuel.

– Pull off fuel supply line „1“ at both ends of fuel filter „2“ and insert the new filter.

– Always renew the fuel filter. Note the arrows indicating the correct direction of fuel flow.

– Secure the filter to its mount.

– Open the fuel supply line or prime the pump until the fuel flows (see Chapter 4.1.3.).

– Activate mechanical oil pressure monitor (optional extra), chap. 4.1.4.

– Run the engine briefly to check the fuel filter and lines for leaks.

5.4.2. Dry-type air cleaner maintenance

It is best to clean the filter cartridge only when the maintenance indicator displays the appropriate signal.
Apart from this, the cartridge should be renewed after 500 hours of operation.

– On fully encapsulated engines, take off the top cover (see Chapter 2).
  On engines with manual starting only, the decompression lever is also taken off when the cover is removed.

45

– Slacken off wing bolt „1“ and remove it with cover „2“.

46

– Carefully pull out filter cartridge „1“.

– On the version with air cleaner maintenance indicator, check that valve plate „4“ is clean and in good condition.

Noise reduced model

47

– Unscrew hex. nut „1“ and take off filter housing „2“.

48

– Unscrew the hex. nuts and remove them with filter cover „1“.

– Carefully pull out filter cartridge.

– Clean all parts except for the filtercartridge.

Do not spray into the engine’s air intake when cleaning.

Cleaning the filter cartridge

Dry contamination

49

– Blow through the filter cartridge from the inside, moving the jet of dry compressed air up and down until no further dust is expelled.
Warning: air pressure must not exceed 5 bar.

Persons handling compressed air must wear protective goggles.

– Tilt the filter element and hold it against the light (or shine a light through it) to trace any cracks or other damage.

Important:
If there is even the slightest damage to paper filter element „2“ or sealing lips „3“, the filter element should not be re-used.
(Figs. 46 and 48)

Wet or oily contamination

– Renew the filter cartridge.

– Re-assemble in the reverse order of work.

6. Malfunctions – Causes – Remedies

Malfunction	Possible causes	Remedial action	Chap.
Engine will not start or start is delayed, although it can be turned over with the starter.	Speed control lever is in stop or idle position.		
	Stop lever in stop position.	Set lever to „START“-position	4.2.
	No fuel reaching injection pump.	Add. fuel.	4.1.3. 4.1.4.
		Check entire fuel supply system carefully. If no fault is found: - supply line to engine - fuel filter - Function of delivery pump must be checked.	 5.4.1. 4.1.3.
	Compression too low: - Valve clearances incorrect	Check valve clearances, adjust if necessary.	5.3.3.
	- Cylinder bore and/or piston ring wear	See workshop manual.	
	Injector not operating correctly.	See workshop manual.	
Also applicable for engines with mechanical oil pressure monitoring.	Oil pressure lost.	Check engine oil level.	5.2.1.
		Activate mechanical oil pressure monitor.	4.1.4
At low temperatures.	Lower starting temperature limit exceeded.	Comply with cold starting instructions.	4.2.4.
		Operate preheat system (optional extra).	4.2.5.
	Machinery not uncoupled.	Disengage engine from machinery or equipment if possible.	
	Defective preheat system (optional extra).	See workshop manual.	

Malfunction	Possible causes	Remedial action	Chap.
At low temperatures.	Fuel separates has inadequate resistance to low temperatures.	Check whether clear (not turbid) fuel emerges at the fuel line detached from the injection pump. If turbid or separated - either warm up the engine or drain the complete fuel supply system. Refuel with winter-grade fuel to which paraffin has been added.	4.1.3.
	Starting speed too low: - Engine oil is too thick	Refill with a different grade of engine oil.	5.3.2.
	- Battery charge is insufficient.	Check the battery; consult a specialist workshop if necessary.	7.
Starter does not run or engine is not turned over.	Fault in electrical system: - Battery and/or other wiring is wrongly connected. - Wiring connections loose and/or corroded. - Battery defective and/or flat. - Defective starter motor - Defective relays, monitoring elements etc.	Check electrical system incl. indiv. components or contact a HATZ-service station.	7.
Engine fires but stops again as soon as starter is switched off.	Drive still engaged.	Uncouple engine from driven machinery if possible.	
	Fuel filter blocked.	Renew the fuel filter.	5.4.1.
	Fuel supply interrupted.	Check through the entire fuel supply systematically.	
	Stop signal from monitoring element for automatic shutdown system (optional extra): - oil pressure lost	Check oil level.	5.2.1.
	- cylinder head temperature too high.	Clean cooling air system.	5.3.4.
	- alternator has failed	See workshop manual.	

Malfunction	Possible causes	Remedial action	Chap.
Engine stops by itself during regular operation.	Fuel supply is interrupted:		
	- Tank run dry	Add fuel.	4.1.3. 4.1.4.
	- Fuel filter blocked	Renew fuel filter.	5.4.1.
	- Defective feed pump.	Check through entire fuel supply system.	
	- Air in the fuel system.	Check fuel system for penetration of air. Check air vent valve.	
	Mechanical oil pressure monitor stops the engine due to low oil pressure.	Check engine oil level. Activate mechanical oil pressure monitor.	5.2.1. 4.1.4.
	Mechanical defects.	Contact a HATZ-service station.	
In addition, if automatic engine shutdown is installed.	Stop signal from monitoring element because of:	Check engine for:	
	- oil pressure too low.	Engine oil level.	
	- cylinder head temperature too high.	Cooling air passages blocked or cooling system otherwise affected.	
	- alternator has failed	See workshop manual.	
Low engine power, output and speed.	Fuel supply is obstructed:		
	- Tank run dry.	Add fuel.	4.1.3. 4.1.4.
	- Fuel filter blocked.	Renew fuel filter.	5.4.1.
	- Tank venting is inadequate	Ensure that tank is adequately vented.	
	- Leaks at pipe unions.	Check threaded pipe unions for leaks.	
	- Air in the fuel system.	Check fuel system for penetration of air. Check air vent valve.	
	- Speed control lever does not remain in selected position.	Prevent speed control from moving.	

Malfunction	Possible causes	Remedial action	Chap.
Low engine power, output and speed, black exhaust smoke.	Air cleaner blocked. Incorrect valve clearances. Malfunction at injector.	Remove dirt from air cleaner. Adjust valve clearances. See workshop manual.	5.3.1. 5.4.2. 5.3.3.
Engine runs very hot. Cylinder head overheat, telltale lamp (optional extra) comes on.	Too much oil in engine. Inadequate cooling: - Entire cooling air system contaminated. - Inadequate sealing at air guide plates or capsule elements.	Drain off engine oil down to upper mark on dipstick. Clean cooling air system. Check that air guide plates and enclosure elements are all present and make a tight seal.	5.3.2. 5.3.4.

7. Work on the electrical system

Batteries generate explosive gases. Keep them away from naked flame and sparks which could cause them to ignite. Do not smoke. Protect the eyes, skin and clothing against battery acid. Pour clear water over acid splashes immediately. In case of emergency call doctor.
Do not place any tools on top of the battery.

Always disconnect the negative (–) pole of the battery before working on the electric device.

– The **positive (+)** and **negative (–**) battery terminals must not be accidentally interchanged.

– When **installing the battery**, connect the **positive lead** first, followed by the **negative lead**. Negative pole to earth (ground) on engine block.

– When **removing the battery**, disconnect the **negative lead** first, followed by the **positive lead.**

– In all circumstances, **avoid short circuits** and shorts to earth (ground) at live cables.

– If electrical faults occur, first **check** for good contact at the **cable connections**.

– Replace a **failed indicator light** without delay.

– Do not take the key out while the engine is running.

– Never **disconnect the battery** while the engine is running. Electric voltage peaks can cause damage to electrical components.

– In case of an **emergency start in manual mode**, leave the battery (which might be discharged) connected to the engine.

– For **emergency operation without battery**, make sure that the plug-and-socket connector to the instrument box is disconnected additionally before the engine is started.

– Do not splash electrical device with water jet or pressure jet during engine cleaning.

– When carrying out **welding work** on the engine or attached equipment, attach the earth (ground) clip as near as possible to the welding point, and disconnect the battery.
If an alternator is fitted, separate the plug connector leading to the voltage regulator.

The relevant circuit diagrams are supplied with engines which have an electrical system. Additional copies of circuit diagrams can be obtained on request.

HATZ assumes no liability for electrical systems which was not carried out acc. HATZ circuit diagrams.

8. Protective treatment

A new engine can normally be stored for up to 12 months in a dry place.
If atmospheric humidity is high (or if exposed to sea air), protection is sufficient for about 6 months' storage.
If the engine is to be stored for a longer period, or laid up out of use, please consult the nearest **HATZ service point**.

Techninės priežiūros patvirtinimas

Reikšti garantinius reikalavimus galima tik tuo atveju, jei atliekami numatyti techninės priežiūros darbai (tik įgaliotose dirbtuvėse)! Po kiekvieno atlikto techninės priežiūros intervalo mums būtina nedelsiant pateikti šį techninės priežiūros intervalą (su parašu ir spaudu) 1).

1) El. paštu: service@probst-handling.com / faksu arba paštu

Eksploatuotojas: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Prietaiso tipas: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ **Gaminio Nr.:** _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Prietaiso Nr.: _ _ _ _ _ _ _ _ _ _ _ _ **Pagaminimo metai:** _ _ _ _

Techninės priežiūros darbai po 25 eksploatavimo valandų

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		Spaudas
		……
		Pavadinimas *Parašas*

Techninės priežiūros darbai kas 50 eksploatavimo valandų

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		Pavadinimas *Parašas*
		Spaudas
		……
		Pavadinimas *Parašas*
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		……
		Pavadinimas *Parašas*

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