DANA BREVINI®
Motion Systems

Installation and Maintenance Manual

BWE-BWP Winches

IMM-0008EN
October 2020

DISCLAIMER

The official language chosen by the Product manufacturer is English. No liability is assumed as a result of translations in other languages not in compliance with the original meaning. In case of conflicting language versions of this document, the English original prevails. Dana shall not be liable for any misinterpretation of the content here into. Photos and illustrations might not represent the exact product.

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1 GENERAL INFORMATION

1.1 INTRODUCTION

Dana Motion Systems Italia srl would like to thank you for choosing one of its products and is pleased to welcome you as a Customer. We are confident you will find using this winch very satisfactory.

The official language chosen by the Product manufacturer is English. No liability is assumed as a result of translations in other languages not in compliance with the original meaning. In case of conflicting language versions of this document, the English original prevails. Dana shall not be liable for any misinterpretation of the content here into. Photos and illustrations might not represent the exact product.

1.2 GENERAL WARNINGS AND INFORMATIONE USE

The instruction manual contains important information on safety, operation and maintenance of **Dana Motion Systems Italia srl** hoists and related accessories. It is intended for people who use and maintenance these items.

We inform you that we do not assume responsibility for any damage or malfunctions resulting from failure to follow the manual. Operational errors and poor maintenance can cause malfunctions and subsequent repairs.

Subject to technical changes by **Dana Motion Systems Italia srl**.

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If, however, during use or maintenance of the winch problems arise, please contact our customer service.

AFTER SALES SERVICES REGGIO EMILIA

Dana Motion Systems Italia srl

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1.2.1 READING THE MANUAL

In order to facilitate the understanding of this manual, we are listing the terms and symbols used below:

NOTICE

Information, read carefully

⚠ CAUTION

Means if the precaution is not taken, it may cause minor or moderate injury.

⚠ WARNING

Means if the warning is not heeded, it can cause death or serious injury.

⚠ DANGER

Means if the danger is not avoided, it will cause death or serious injury.

1.3 DECLARATION OF CONFORMITY

A fac-simile of the EC declaration of conformity is here below attached.

All the EC declarations that may have been supplied with the winch and rope, must be kept with the documents of the machine.

Dana Incorporated
Dana Motion Systems Italia S.r.l. Power Transmission Division
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DICHIARAZIONE CE DI CONFORMITÀ
EC DECLARATION OF CONFORMITY

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ НА ЕС◆ES PROHLÁŠENÍ OSHODĚ◆OVERENSSTEMMELSESERKLÆRING◆CE VASTAVUSDEKLARATSIOON◆ ΕΥ VAATIMUSTENMUKAISUUSVAKUUTUS◆DÉCLARATION CE DE CONFORMITÉ◆ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΚ◆DEARBHÚ COMHRÉIREACHTA◆EK ATBILSTĪBAS DEKLARĀCIJA◆ ATITIKTIES DEKLARACIJA◆ DIKJARAZZJONI TA' KONFORMITÀ CE◆EG-VERKLARING VAN OVEREENSTEMMING◆DEKLARACJA ZGODNOŚCICE◆ DECLARAÇÃO CE DE CONFORMIDADE◆DECLARAŢIE CE DE CONFORMITATE◆PREHLÁSENIE O ZHODE◆IZJAVA O SKLADNOSTI CE◆DECLARACIÓN CE DE CONFORMIDAD◆EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE◆EG-KONFORMITÄTSERKLÄRUNG ◆CE MEGFELELŐSÉGI NYILATKOZAT

Ai sensi della Direttiva Macchine 2006/42/CE, Allegato II lett. A
In accordance with Machinery Directive 2006/42/EC, Annexe II (A)

По силата на Директива 2006/42/ЕО за машините, Анекс II, буква A◆ve smyslu směrnice o strojních zařízeních 2006/42/ES, příloha II, písm. A◆ I medfør af maskindirektivet 2006/42/EF, Bilag II stk. A◆ Vastavalt masinadirektiivi 2006/42/EÜ lisa II punktile A◆Konedirektiivin 2006/42/EY liitteen II A◆ Aux termes de la directive machines 2006/42/CE, Annexe II let. A◆ Σύμφωνα με την Οδηγία για τις μηχανές 2006/42/ΕΚ, Παράρτημα II A◆ I gcomhréir leis an Treoir um Innealra 2006/42/CE, Iarscríbhinn II (A)◆ Saskaņā ar mašīnu direktīvas 2006/42/EK pielikuma II A prasībām◆ Pagal Mašinų direktyvos 2006/42/EB II (A) priedą◆B'konformità mad-Direttiva dwar il-Magni 2006/42/KE, Anness II ittra A◆Overeenkomstig de Machinerichtlijn 2006/42/EG, Bijlage II punt A◆Zgodnie z treścią Dyrektywy Maszynowej 2006/42/WE, Załącznik II lit. A◆ Ao abrigo da Directiva "Máquinas" 2006/42/CE, Anexo II letra A◆ În conformitate cu Directiva Maşini 2006/42/CE, Anexa II lit. A◆V zmysle smernice o strojových zariadeniach 2006/42/ES, príloha II písm. A◆ V skladu z direktivo o strojih 2006/42/ES, priloga II, točka A◆ Según lo dispuesto por la Directiva Máquinas 2006/42/CE, Anexo II letra A◆I enlighet med maskindirektivet 2006/42/EG, bilaga II, bokstav A◆Im Sinne der Maschinenrichtlinie 2006/42/EG, Anhang II A◆ A 2006/42/EK sz. gépekről szóló irányelv, II. melléklet A pontja értelmében

Il fabbricante
The Manufacturer

Производителят◆ výrobce◆erklærer producenten◆ deklareerib tootja◆ mukaisesti valmistaja◆ Le fabricant◆ Ο κατασκευαστής◆ dearbhaíonn an Monaróir◆ Ražotājs◆Gamintojas◆Il-manifattur◆ De fabrikant◆ Producent◆ O fabricante◆ Producătorul◆ Výrobca◆proizvajalec◆ El fabricante◆ försäkrar tillverkaren◆ Der Hersteller◆ A gyártó

Dana Motion Systems Italia S.r.l.
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dichiara che la macchina
hereby declares that the machine

декларира, че машината◆ prohlašuje, že stroj◆ at maskinen◆ et masin◆ vakuuttaa, että kone◆ déclare que la machine◆ δηλώνει ότι το μηχάνημα◆ leis seo, go gcloíonn an meaisín◆ paziņo, ka mašīna◆šiuo dokumentu pareiškia, kad◆jiddikjara li l-magna◆verklaart dat de machine◆ oświadcza, że maszyna◆ declara que a máquina◆ declară că utilajul◆ prehlasuje, že zariadenie◆izjavlja, da je stroj◆ declara que la máquina◆ att maskinen◆ erklärt hiermit, dass die Maschine◆ kijelenti, hogy az alábbi gép

Tipo/Type Тип◆Typ◆Tüüp◆ tyyppi◆ Τύπος◆ Cineál◆Tips◆Tipas◆Tip◆ Tipus	**Argano/ Winch** Скрипец◆ naviják◆ Løftespil◆ vintturi◆ Treuil◆ Βαρούλκο◆ Vinča◆ Lier◆ Wciągarka◆Cabrestante◆ Troliu◆ Vitel◆ Vinsch◆ Seilwinde◆ Emelőmű
Modello/ Model Модел◆ Mudel◆ malli◆ Modèle◆ Μοντέλο◆ Samhail◆ Modelis◆ Mudell◆ Modelo◆ Modell	
Numero di matricola/ Serial Number Регистрационенномер◆ Výrobní číslo◆ Matrikelnummer◆ Seerianumber◆ valmistusnumero◆ Numéro de série◆ Αριθμός σειράς◆ Sraithuimhir◆ Sērijasnumurs◆ Registracijos numeris◆ Numru tas-serje◆ Serienummer◆ Numer fabryczny◆ Número de registo◆ Număr deserie◆ Katalógové číslo◆ Serijska številka◆ Número de matrícula◆ Serie-nummer◆ Artikel-Nr. ◆ Gyártási szám	
Tiro al 1° strato/ Line pull first layer Подемна сила на I навиване◆ Tah na 1. vrstvě◆ Trækkraft på 1. lag◆ Tõmbejõud◆ veto ensimmäisellä kerroksella◆ Tension 1° spire◆ Έλξη στην 1η στρώση◆ Línetharraingt chéad shraith◆1. slāņa spriegojums◆ Tempiamoji aprkova pirmame sluoksnyje◆ Għbid fl-ewwel saff◆ Kracht op de eerste laag◆ Udźwig 1 warstwy liny◆ Tração no 1º nível◆ Tracţiune la primul strat◆ Zaťaženie v 1. vrstve◆ Vlek na 1. sloju◆ Tiro en la 1ª capa◆ Dragkraft i första lagret◆ Zugkraft auf der 1. Seillage◆ Húzás 1 réteggel	
Tiro al 1° strato LoP/ Line pull first layer LoP Подемна сила на I навиване◆ Tah na 1. vrstvě◆ Trækkraft på 1. lag◆ Tõmbejõud◆ veto ensimmäisellä kerroksella◆ Tension 1° spire◆ Έλξη στην 1η στρώση◆ Línetharraingt chéad shraith◆1. slāņa spriegojums◆ Tempiamoji aprkova pirmame sluoksnyje◆ Għbid fl-ewwel saff◆ Kracht op de eerste laag◆ Udźwig 1 warstwy liny◆ Tração no 1º nível◆ Tracţiune la primul strat◆ Zaťaženie v 1. vrstve◆ Vlek na 1. sloju◆ Tiro en la 1ª capa◆ Dragkraft i första lagret◆ Zugkraft auf der 1. Seillage◆ Húzás 1 réteggel	
Anno di costruzione/ Year of manufacture Година на производство◆ Rok výroby◆ Fremstillingsår◆ Ehitusaasta◆ valmistusvuosi◆ Année de construction◆Έτος κατασκευής◆ Bliain monaraíochta◆ Ražošanas gads◆ Pagaminimo metai◆ Sena meta ġiet prodotta◆ Bouwjaar◆ Rok produkcji◆ Ano de construção◆ Anul fabricaţiei◆ Rok výroby◆ Leto proizvodnje◆ Tillverkningsår◆ Baujahr◆ A gyártás éve	
Ordine di vendita/Sales order Поръчка за продажба◆Objednávka◆Salgsordre◆Verkaufsauftrag◆ Εντολή πώλησης◆ Pedido de venta◆Müügitellimus ◆Myyntimääräys◆ Ordre de vente ◆Ordú díolacháin◆ Értékesítési megrendelés◆Pardavimo užsakymas ◆Pārdošanas pasūtījums◆Ordni ta' bejgħ◆Verkooporder◆ Zamówienie sprzedaży◆ Ordem de venda◆ Comandă de vânzare◆ Predbežná objednávka◆Prodajni nalog◆ Försäljningsorder	
Ordine di Produzione/Work order Поръчка за производство◆ Pracovní příkaz◆Produktionsordre◆Fertigungsauftrag◆ Εντολή εργασίας◆Pedido de Producción ◆ Töökäsk◆Työmääräys◆Ordre de production◆Ordú oibre◆ Termelési megrendelés-- Gamybos užsakymas ◆Ražošanas pasūtījums◆ Ordni ta' xogħol◆Werkorder◆ Zamówienie produkcyjne◆Ordem de trabalho◆Comandă de producţie ◆Záväzná objednávka◆ Delovni nalog◆ Arbetsorder	

Doc. F0304.07

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è conforme alle disposizioni pertinenti della Direttiva Macchine e 2006/42/CE e che sono state utilizzate le seguenti norme di riferimento:
complies with the requirements of the Machinery Directive 2006/42/EC and that the following standards have been applied:

съответства на всички приложими разпоредби на Директива 2006/42/ЕО за машините и са използвани следните стандарти:
◆ je v souladu s odpovídajícími ustanoveními směrnice o strojních zařízeních 2006/42/ES byly použity následující příslušné normy:
◆ er i overensstemmelse med de relevante bestemmelser i maskindirektivet 2006/42/EF, og at der ved produktionen er anvendt følgende standarder:
◆ vastab masinadirektiivi 2006/42/EÜ sätetele ning et kasutatud on järgmisi viitenorme:
◆täyttää kaikki konedirektiivin 2006/42/EY vaatimukset ja että sen valmistuksessa on noudatettu myös seuraavia normeja:
◆ est conforme aux dispositions dont la directive machines 2006/42/CE et que les normes de référence ci-dessous ont été utilisées:
◆ πληροί τις διατάξεις που αφορούν την Οδηγία για τις μηχανές 2006/42/ΕΚ και ότι χρησιμοποιήθηκαν τα παρακάτω πρότυπα αναφορ:
◆ le ceanglais na Treorach um Innealra 2006/42/CE agus gur cuireadh na caighdeáin seo a leanas chun feidhme:
◆ atbilst mašīnu Direktīvas 2006/42/EK prasībām un, ka tika ievēroti šādi standarti:
◆ atitinka Mašinų direktyvos 2006/42/EB reikalavimus ir kad buvo taikomi šie standartai:
◆hi konformi mad-dispożizzjonijiet fir-rigward tad-Direttiva dwar il-Magni 2006/42/KE u li ntużaw l-istandards ta' referenza li ġejjin:
◆ Voldoet aan de relevante bepalingen van de Machinerichtlijn 2006/42/EG en dat volgende referentienormen werden toegepast:
◆ spełnia mające zastosowanie wymagania Dyrektywy Maszynowej 2006/45/WE oraz następujących stosownych norm:
◆ se encontra em conformidade com as disposições pertinentes da Directiva “Máquinas” 2006/42/CE e que foram utilizadas as seguintes normas de referência:
◆ este conform cu dispoziţiile corespunzătoare din Directiva Maşini 2006/42/CE şi că au fost utilizate următoarele norme de referinţă:
◆spĺňa podmienky ustanovené smernicou o Strojových zariadeniach 2006/42/ES a vyhovuje nasledujúcim súvisiacim normám:
◆ v skladu z ustreznimi zahtevami direktive o strojih 2006/42/CE in da so bili uporabljeni naslednji relevantni standardi:
◆ cumple con las disposiciones pertinentes de la Directiva Máquinas 2006/42/CE y que se han utilizado las siguientes normas de referencia:
◆ överensstämmer med bestämmelserna i maskindirektivet 2006/42/EG och att följande referensstandarder har använts:
◆ den Bestimmungen der oben bezeichneten Maschinenrichtlinie 2006/42/EG entspricht und dass folgende Bezugsnormen angewandt wurden:
◆ megfelel a 2006/42/EK sz. gépekről szóló irányelvnek, és gyártása során az alábbi szabványokat követték:

ISO 4301/1 - ISO 4308/1 - ISO 4309 - ISO 6336 - UNI ISO 281 - FEM 1.001
EN 14492-2 (§ 5.2, 5.4, 5.5, 5.6, 5.7, 5.11, 5.14, 6, 7) – EN13852/1 (§ 5.10)

Il fabbricante inoltre dichiara che il fascicolo tecnico della costruzione è costituito e custodito presso l’azienda Dana Motion Systems Italia S.r.l.
The manufacturer also declares that the Technical Construction File is available for inspection at Dana Motion Systems Italia S.r.l.

Производителят заявява също така, че техническото досие за изработването на машината е съставено и се съхранява в компанията Dana Motion Systems Italia S.r.l.
◆ Výrobce dále prohlašuje, že technická dokumentace ke konstrukci stroje byla vytvořena v podniku Dana Motion Systems Italia S.r.l., a je v něm také uložena.
◆ Producenten erklærer desuden, at den tekniske dokumentation for konstruktionen er udarbejdet og opbevares hos virksomheden Dana Motion Systems Italia S.r.l.
◆ Lisaks kinnitab tootja, et seadme valmistamise tehnilised dokumendid on koostatud ja neid säilitatakse ettevõttes Dana Motion Systems Italia S.r.l.
◆ Lisäksi valmistaja vakuuttaa, että koneen teknisen dokumentaation on laatinut ja sitä säilyttää Dana Motion Systems Italia S.r.l.
◆ Le fabricant déclare en outre que le fascicule technique de la construction est constitué et conservé à l'entreprise Dana Motion Systems Italia S.r.l.
◆ Επίσης, ο κατασκευαστής δηλώνει ο τεχνικός φάκελος κατασκευής φυλάσσεται στην εταιρεία Dana Motion Systems Italia S.r.l.
◆. Dearbhaíonn an monaróir freisin gur féidir scrúdú a dhéanamh ar an gComhad Tógála Teicniúil ag Dana Motion Systems Italia S.r.l.
◆ Turklāt, ražotājs paziņo, ka ar ražošanu saistītā tehniskā dokumentācija glabājas uzņēmumā Dana Motion Systems Italia S.r.l.
◆ Gamintojas taip pat pareiškia, kad bendrovėje „Dana Motion Systems Italia S.r.l.“ galima gauti ir peržiūrėti techninių dokumentų bylą.
◆ Fl-imkien ma' dan, il-manifattur jiddikjara li l-fajl tekniku tal-kostruzzjoni hu kkostitwit u jinsab għand il-kumpanija Dana Motion Systems Italia S.r.l.
◆ De fabricant verklaart tevens dat het technische dossier van de constructie is opgesteld en wordt bewaard bij het bedrijf Dana Motion Systems Italia S.r.l.
◆ Ponadto, producent oświadcza, że broszura techniczna dotycząca wykonania jest przechowywana w siedzibie zakładu Dana Motion Systems Italia S.r.l.
◆ Adicionalmente, o fabricante declara que o dossier técnico de construção foi elaborado e conservado na empresa Dana Motion Systems Italia S.r.l.
◆ De asemenea, producătorul declară că dosarul tehnic al utilajului este în păstrarea companiei Dana Motion Systems Italia S.r.l.
◆Výrobca ďalej prehlasuje, že technická dokumentácia o konštrukcii a výrobe zariadenia je uložená vo firme Dana Motion Systems Italia S.r.l.
◆Proizvajalec izjavlja tudi to, da je tehnično dokumentacijo predal v hrambo podjetju Dana Motion Systems Italia S.r.l.
◆ Además, el fabricante declara que el fascículo técnico de la construcción ha sido realizado y es conservado en la empresa Dana Motion Systems Italia S.r.l.
◆Tillverkaren försäkrar dessutom att teknisk konstruktionsdokumentation har inlämnats till och förvaras vid företaget Dana Motion Systems Italia S.r.l.
◆ Der Hersteller erklärt ferner, dass die technische Dokumentation der Konstruktion beim Unternehmen Dana Motion Systems Italia S.r.l. besteht und verwahrt wird.
◆ A gyártó ezen felül kijelenti, hogy a gyártás műszaki dokumentációját a Dana Motion Systems Italia S.r.l. készítette és őrzi.

Dana Motion Systems Italia S.r.l.
Via Luciano Brevini 1/A
42124 Reggio Emilia – ITALY

Reggio Emilia, 2017-04-27

Head of Engineering
Alessandro Vighi

General Manager *
Matteo Foletti

* Il legale responsabile/rappresentante ◆ The legal/authorized representative ◆Упълномощен/представител◆zákonná odpovědná osoba/zástupce◆Den tegningsberettigede/repræsentant◆Seadusjärgne/Seaduslik esindaja ◆ Laillinen edustaja/vastuuhenkilö◆Le fondé de pouvoirs/représentant ◆Ο νομικός υπεύθυνος//εκπρόσ◆An t-ionadaí dlíthiúil/údaraithe ◆ Pilnvarotais pārstāvis/pārstāvis◆Teisinis / įgaliotasis atstovas◆Ir-rappreżentant legali/rappreżentant ◆De wettelijk aansprakelijke/vertegenwoordiger◆Upoważniony przedstawiciel /prawny ◆O responsável/representante legal◆Responsabil legal/reprezentant◆Zákonný zástupca/reprezentant◆Pravni zastopnik/predstavnik◆El responsable/representante legal ◆ Ansvarig /representant ◆ Der gesetzlich Haftende/Rechtsvertreter ◆ Felelő Felelős vezető/képviselő

Doc. F0304.07

1.4 AIM OF THE INSTRUCTION MANUAL

This manual is an integral part of the machine and aims to provide all the information necessary for:

- making personnel aware of the problems related to safety;
- handling the machine both packed and unpacked, in safe conditions;
- correct installation of the machine;
- acquiring a thorough knowledge of its operation and limits;
- its correct use in safe conditions;
- carrying out production changes and maintenance operations, correctly and safely;
- dismantling the machine in safe conditions and in compliance with the standards in force concerning protection of the environment and health of workers.

NOTICE

In compliance with the standards in force, persons in charge of the company and the person in charge of running the machine must read the contents of this document carefully and ensure that the operative and maintenance staff read the parts which regard them. The time taken to do this is worthwhile since you will be able to achieve correct and safe system operation.

The instructions, drawings and literature contained in this manual are to be considered as confidential technical information that is property of **Dana Motion Systems Italia srl.** They must not be reproduced in any manner either wholly or partially.

If modifications are made to this document by **Dana Motion Systems Italia srl**, the customer has the responsibility of ensuring that only the updated version of the manual is available.

1.5 KEEPING THE INSTRUCTION MANUAL

This manual must be kept with care throughout the entire service life of the machine for future consultation, even if the same is sold on.

The manual will remain in good condition for a longer time if it is handled carefully, with clean hands, and if it is not placed on dirty surfaces. Keep the manual in a place protected against damp and heat.

Do not remove, tear out or arbitrarily modify any parts of the manual.

Upon written demand of the customer, **Dana Motion Systems Italia srl** can supply further copies of the manual.

1.6 METHOD FOR UPDATING THE INSTRUCTION MANUAL IN THE EVENT OF MODIFICATIONS TO THE MACHINE

Dana Motion Systems Italia srl is relieved from each and any liability in the event of printing errors in this manual. This manual is valid from the date of the invoice relating to the product that the manual describes. The revision level of the manual is printed on the same. In the event of further revisions of this manual, **Dana Motion Systems Italia srl**, as far as parts relating to standards and spare parts are concerned, undertakes to update the manual and report the new manual revision index. The manufacturer refuses each and any direct or indirect liability for improper use of the manual with a revision index that does not correspond to the serial number of the machine, date of invoice and date of revision of the manual.

1.7 CONSULTING THE MANUAL

This manual is divided into chapters and numbered paragraphs to facilitate consulting.

Each page features:

- logo of the manufacturer;
- number and title of the chapter;
- text of the document;
- pictograms;
- page number.

If in doubt about the correct interpretation of the instructions, contact the manufacturer for obtain the necessary clarifications.

For a quick search of the topics covered, consult the descriptive index.

1.8 PICTOGRAMS RELATING TO THE OPERATOR QUALIFICATION LEVEL

Pictogram	Qualification	Description
	Machine operator	Operator with no specific skills, capable of performing simple tasks only, i.e. running the system with its controls.
	Lifting and transport equipment operator	Operator trained for driving and using material and machine lifting and transport gear (the instructions of the manufacturer of these must be scrupulously followed) in accordance to the laws in force in the machine user's country.
	Maintenance mechanic	Qualified technician capable of running the machine in normal conditions; running it with guards deactivated using a dead-man control; carrying out adjustments, maintenance or repair work on mechanical components.
	Manufacturer's technician	Qualified technician provided by the manufacturer to carry out complicated operations in particular situations, as established with the user. Specialized mechanical and/or electric and/or software technicians are available according to need.
	Installer	Design technician who knows the requirements of the machine, its related circuits and its regulations.

1.9 MANDATORY PICTOGRAMS RELATING TO SAFETY

Pictogram	Description
	Read the instructions carefully before starting any activity.
	Always wear protective gauntlets: this symbol means that operators should be wearing protective gauntlets for electrical/thermal insulation.
	Always wear accident-prevention footwear: this symbol means that the operator must be wearing accident-prevention footwear.
	Always wear accident-prevention helmet: this symbol means that the operator must be wearing accident-prevention head.
	Always wear accident-prevention glasses: this symbol means that the operator must be wearing accident-prevention glasses.
	Always wear noise-protection earmuffs: this symbol means that the operator must be wearing noise-protection earmuffs.

1.10 DANGER PICTOGRAMS RELATING TO SAFETY

Pictogram	Description
	Danger of hand/arm and leg/foot crushing: this symbol instructs operators to pay particular attention towards mechanical components that could cause hand/arm and leg/foot crushing in the event of unexpected movements or imprudent maneuvers of the operators themselves.
	Beware of suspended loads: this symbol warns operators of the danger of suspended loads, which may arise when parts of the machine are lifted.
	Danger of moving forklift trucks: this symbol warns operators of the danger of forklift trucks moving near the machine.
	Pay attention to the danger of cutting.
	Attention to the projection of objects and to the ejection of fluids under pressure and at high temperature.

1.11 PROHIBITION PICTOGRAMS RELATING TO SAFETY

Pictogram	Description
	It is forbidden to approach the machine with loose clothing. Workers should not wear loose-fitting clothing, chains, or other loose jewelry around equipment that poses an entanglement hazard. Long hair should be tied back to keep it safely out of danger.

1.12 GENERAL INFORMATION

NOTICE

Before carrying out any operations on the machine, the trained operators and technicians must carefully read the instructions contained in this manual (and attached documents) and follow them whilst carrying out the various operations. If you have any doubts concerning the interpretation of these instructions, call our TECHNICAL SERVICE CENTRE for the necessary explanations.

This manual contains information concerning storage, transport, installation, use, supervision, maintenance and disassembly of the machine described.

This manual is an integral part of the machine and must be kept throughout the entire service life of the same for future consultation. If your copy of the manual becomes unreadable, ask the manufacturer in writing for a new copy at the following address:

- Dana Motion Systems Italia srl
- Via Luciano Brevini 1/A
- 42124 Reggio Emilia
- Ph.: +39-0522 9281

This manual aims at giving the users of our hoisting winches all the necessary information in order to install, operate, maintain, set, clean and dismantle correctly the winches in compliance with the safety limits provided for by the standards in force.

BWE-BWP winches have been designed to hoist loads and personnel.

This manual reflects the state-of-the-art the moment the machine was supplied and cannot be considered inadequate if there have been subsequent modifications according to further experience. The Manufacturer reserves the right to update its products and manuals without being obliged to inform the users of machinery previously supplied of these modifications. The provision of information concerning updates of the machine and manual is to be considered as a form of courtesy.

The Customer Assistance Department is at your disposal to provide, upon written demand, all information concerning upgrades applied to the machine.

1.12.1 GENERAL INFORMATION RELATING TO MACHINE USE

This manual has been written to allow the user to become familiar with the machine and provides instructions for the maintenance operations that are fundamental for correct machine performance.

Before performing any operation on the machine, please read this manual carefully as it contains all the information required to use the machine correctly and prevent accidents.

The frequency of the inspection and maintenance procedures prescribed by the manual is always intended as the minimum necessary for ensuring the efficiency, safety and long life of the machine under normal operating conditions; supervision must in any case be constant in order to take immediate action in the event of faults.

All routine maintenance, controls and lubrication must be carried out by trained and qualified staff, with the machine halted and the supplies (electrical and otherwise) disconnected.

1.12.2 GENERAL SAFETY RECOMMENDATIONS

Read the instructions given in this manual and follow the recommendations provided before starting the machine.

In designing this machine, the manufacturer has made every effort to ensure that it is, as far as is possible, INTRINSICALLY SAFE.

The machine has been fitted with all guards and safety systems deemed necessary. The manufacturer has also provided sufficient information to enable its safe and proper use.

For this purpose, in each chapter, and whenever necessary, the following information is given for each MAN-MACHINE INTERACTION:

- Minimum operator qualification level
- Number of operators needed
- Status of machine
- Residual risks
- Personal protective equipment, mandatory or recommended
- Human reliability
- Restrictions/obligations relating to reasonably predictable improper behavior

NOTICE

The instructions provided must be scrupulously followed.

The user may integrate the information provided by the manufacturer with additional operating instructions that must not be in contrast with the indications given herein, in order to contribute to the safe use of the machine.

For instance, particular attention must be paid towards the clothing worn during machine operation:

- never wear loose-fitting garments that may get caught up in parts of the machine;
- never wear ties or other items that hang loosely;
- never wear large rings that may cause hands to get caught up in moving parts of the machine.

Whenever necessary, further recommendations will be given in the manual on preventive measures to be taken by the user, personal protective equipment, information aimed at preventing human error and restrictions on reasonably predictable prohibited working practices.

The following recommendations must be scrupulously followed:

- It is absolutely forbidden to run the machine in automatic mode with its fixed and/or mobile guards removed.
- It is strictly forbidden to disable the safety devices installed on the machine.
- It is prohibited to perform any operation with the safety devices deactivated.
- Do not modify any part of the machine for any reason whatsoever. In the event of malfunctioning due to failure to observe the above, the manufacturer cannot be held liable for any consequences. Any modifications should preferably be made by the manufacturer directly.

The machines must be positioned as established by the purchase order; see the layouts provided by the manufacturer; on the contrary, no liability will be accepted for any problems which may arise.

1.12.3 GENERAL PRECAUTIONS RELATING TO THE USE OF THE MACHINES

These instructions fall within standard working practices that operators must observe towards the machine. Therefore, during design and construction, the manufacturer has considered them known too.

NOTICE

The user must inform and instruct persons in charge in order to enable these instructions to be passed on to all those working on the machine.

- Do not allow unauthorized personnel to work on the system.
- DO NOT ATTEMPT TO START UP THE MACHINE IF IT IS BROKEN DOWN.
- Before using the system, make sure that any dangerous condition has been appropriately eliminated.
- Make sure that all guards and protection systems are in place and that all safety devices are present and in working order.
- Make sure there are no foreign objects in the operator control area.
- Whenever there is a risk of being hit by projected or falling parts, both solid or in other form, use hard hats and gauntlets if necessary.
- Wear personal protective equipment whenever prescribed.

2 WARRANTY / LIABILITY

- Upon delivery, Products shall be free from defects in material and workmanship and comply with agreed technical specifications.
- The warranty period shall be (i) 12 months or 2000 operating hours (whatever occurs earlier) for Spicer® branded driveline Products, or (ii) 12 months for all other Products, starting in each case from the date of Customer's invoice to the end user or dealer, provided that the warranty period ends in any case latest 18 months after the date of Dana's invoice to Customer. In case of defects, Dana will either (i) if the repair is performed by Customer with Dana's prior written consent, reimburse Customer for costs of spare parts as per Dana's official spare parts list, including the applied discount, and within the limit of the purchase price of the Product in question, or (ii) repair the Product free of charge at its own premises or authorized service center, provided that Customer shall send the defective Product, at its own expense, to the repair location chosen by Dana in its sole discretion. The handling of warranty claims will follow Dana's Standard Warranty Conditions, as updated from time to time, which are available upon request by contacting dana_oh_product_service_support@dana.com. All further claims and remedies with regard to defects of Products, regardless of their nature, amount or legal basis, are hereby expressly excluded unless in case of gross negligence and willful misconduct by Dana. Except as stated herein, there are no representations or warranties, express or implied, with regard to the Products.
- The warranty does not cover (a) Products or components thereof not purchased directly from Dana; (b) products supplied as prior to production approval; or (c) Products that have experienced (i) maintenance and/or repairs which are not executed in accordance with Dana's official service manual available upon request by contacting dana_oh_product_service_support@dana.com, (ii) storage or transport conditions which are not in accordance with Dana's requirements available upon request by contacting dana_oh_product_service_support@dana.com, (iii) non-professional installation of the Products or of ancillaries, (iv) damage caused by normal wear and tear, (v) damage caused during reassembly or installation, (vi) operation of the Product or application which is not in accordance with agreed application requirements or agreed Product specifications and/or (vii) the use of components, lubricants or ancillary products that are not approved by Dana.
- To the extent permitted by law, neither party shall under any circumstances whatever be liable to the other, whether in contract, tort or restitution, or for breach of statutory duty or misrepresentation, or otherwise, for any loss of profit, loss of goodwill, loss of business, loss of business opportunity, loss of anticipated saving, special, indirect or consequential damage suffered by the other party that arises under or in connection with the contractual relationship between the parties. nothing herein shall limit or exclude the liability of either party for death or personal injury, or for damages resulting from gross negligence, intentional breach or willful misconduct.

2.1 REPRODUCTION LIMITS AND COPYRIGHT

2.2 VERSIONS OF THIS MANUAL

This manual is subject to review further to application and operation changes.

2.2.1 DATE AND INDEX OF THE VERSION OF THE MANUAL

The indications and the date of this version of the manual are published on the last page of the cover.

2.2.2 VERSION TRACKING MODELS

File Name	Rev.	Date	Description
IMM-0008EN_Rev.00 BWE BWP	00	12/10/2020	Document issued

2.3 REQUESTING ASSISTANCE

Any requests for assistance of the Technical Service Department must be sent to the following addresses:

- Dana Motion Systems Italia srl
- Via L. Brevini 1/A,
- 42124 Reggio nell'Emilia - Italy
- Ph.: +39-0522 9281
- Fax: +39-0522 928300
- e-mail: dana.re@dana.com - www.brevinipowertransmission.com

Indicate:

- type of machine, serial number, year of installation
- faults noted
- exact address of the factory in which the machine is installed

2.4 ORDERING SPARE PARTS

Spare parts orders must be submitted in written form (fax or e-mail) to the following address:

- Dana Motion Systems Italia srl
- Via L. Brevini 1/A,
- 42124 Reggio nell'Emilia - Italy
- Ph.: +39-0522 9281
- Fax: +39-0522 928300
- e-mail: dana.re@dana.com - www.brevinipowertransmission.com

To facilitate a rapid and accurate identification of spare parts, always complete your order with the following information:

- serial number of the machine
- description/name of the part
- code of the part
- quantity needed

It is also essential to indicate, if the order is effective, the requested date of delivery, the address to which the parts must be shipped, the invoicing address and any shipping instructions. Provide the name, phone and fax numbers and e-mail address of the person in charge of spare parts supplies.

Upon receiving the order, **Dana Motion Systems Italia srl** will send an order confirmation stating the prices, the date of delivery and supply conditions.

3 MACHINE DESCRIPTION

3.1 PERMITTED USE

The BWE-BWP series winch has been designed and built for hoisting of loads and goods and lifting of personnel.

Lifting of personnel is a configuration of the machine.

The machine must be run by persons that have been trained concerning the characteristics of the same and that are familiar with the contents of this manual.

The machine is semi-automatic since it does call for the presence of an operator during its work cycle.

3.2 REASONABLY FORESEEABLE MISUSE

The following may come under the heading of “reasonably foreseeable misuse” of the winches for lifting:

- all those operations that go beyond the characteristics defined on the name plate of the winch;
- the use of the winches for lifting not identified in the rules for correct operation;
- the use of the winches for lifting in the presence of obstacles liable to interfere with the normal operations they are designed to carry out;
- the use of the winch without the installation of all safety devices identified in product directives and standards;
- the installation of non-suitable rope.

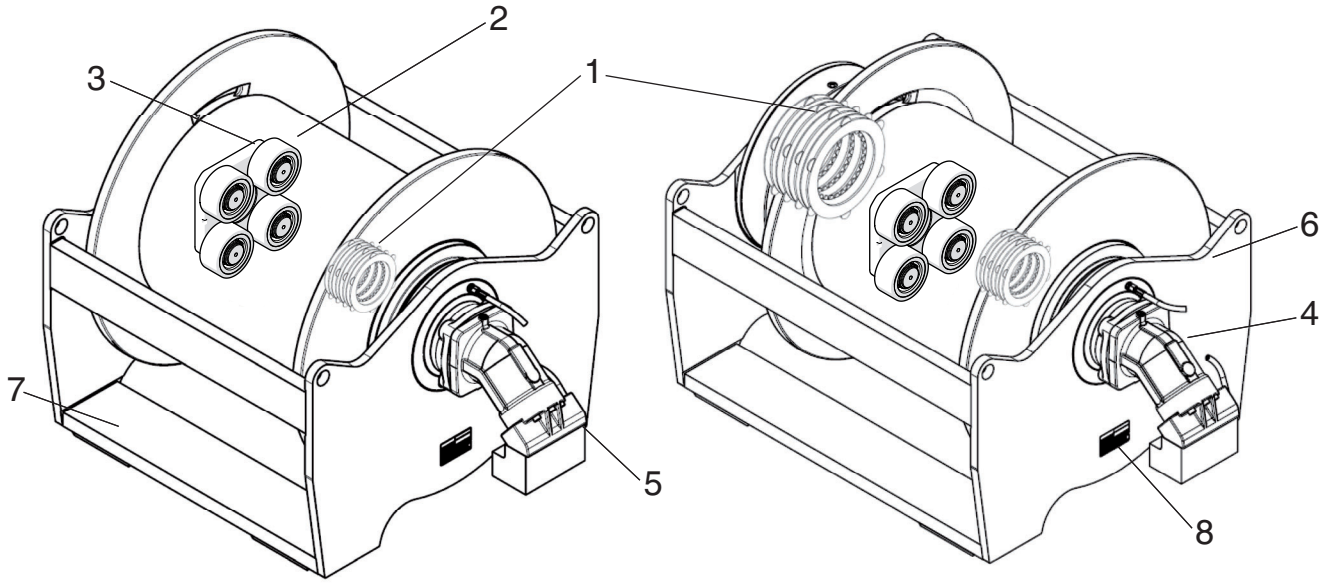
3.3 PROHIBITED USES

The machine cannot be used either partially or totally:

- without its guards and/or with its safety devices deactivated, out-of-order or missing;
- unless it has been correctly installed;
- in dangerous conditions or when it is malfunctioning;
- lifting of personnel when the machine configuration is for hoisting of loads and goods only;
- improperly or by untrained personnel;
- for uses not complying with the specific standard;
- in the event of supply defects;
- if maintenance has been badly conducted or without the proper frequency;
- unless the appropriate personal protective equipment is worn;
- unless operators are suitably trained and informed, concerning safety at work;
- after unauthorized modifications;
- for lifting operations above pipelines and pipes, in the event that the destruction of said pipes and pipes caused by the fall of a load can cause the escape of gas or combustible fluids;
- for lifting, lowering and sliding of hot molten masses or other similarly dangerous objects;
- with material and/or tools differing from those indicated for normal machine operation;
- at an ambient temperature lower than –20°C or higher than +40°C;
- in environments where relative humidity is lower than 10% or higher than 50%;
- in submerged or semi-submerged place or when the load is submerged or semi-submerged;
- in explosive or potentially explosive environments and areas where there is a risk of fires;
- with synthetic or fiber rope;
- unless all instructions are observed.

3.4 MAIN PARTS

The hoist machine is mainly composed of:



1 - Brake and LoP brake
2 - Drum
3 - Gearbox
4 - Hydraulic motor
5 - Over-center valve
6 - Frames
7 - Fixing crossbars
8 - Nameplate

Brake

Safety devices responsible for sustaining the load by providing an opposite torque when the motor is powered; the brake acts on the input of the winch.

Drum

Part of the winch that winds the rope. Grooved drum is suggested to smoothen spooling and with more than two layers of rope. Drum flanges are the boundaries of the drum and their outer diameter is increased for safety reason.

Gearbox

Part of the winch multiplying the torque delivered by the motor to obtain the torque needed to drive the load.

Hydraulic motor

The part delivering the torque to drive the load with pressurized oil.

Over-center valve

A pilot assisted relief valve with an integral free flow check whose function is to prevent uncontrolled movement of the load.

Frames

The structures that support the drum and the other winch components.

Fixing crossbars

The structures that keep together the frames and allow to connect the winch to the customer structure.

Nameplate

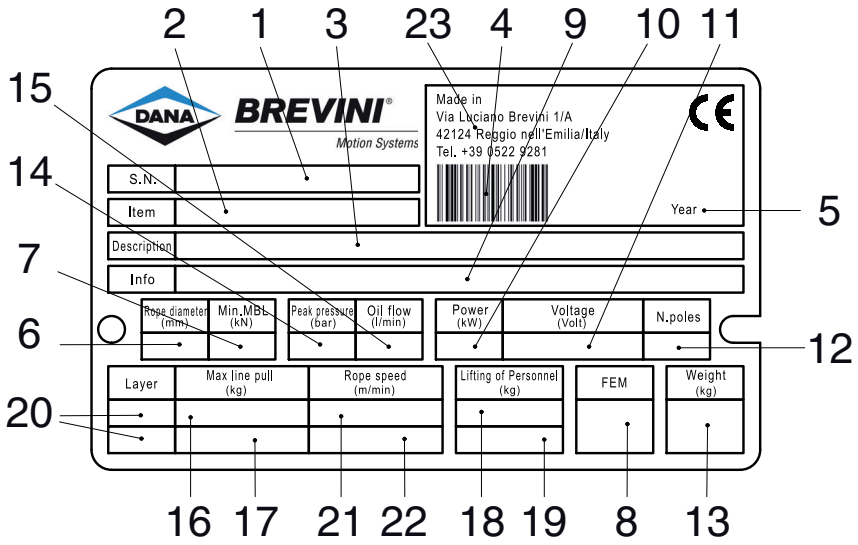
The plate bearing all the information needed to identify the winch.

NOTE:

Components 1, 4, 5, 6, 7 could be not present in the specific configuration supplied. If not present, these components must be integrated by the Installer in order to fulfill all the minimum norm requirements.

3.5 NAMEPLATE

The machine's identification data can be found on the name plate fastened to the machine.



1 - Serial Number
2 - Item
3 - Description
4 - Bar code
5 - Year of construction
6 - Rope diameter [mm]
7 - Rope Minimum Breaking Load (MBL) [kN] referred to top layer
8 - Mechanism Group as per F.E.M.
9 - Info
10 - Power [kW]
11 - Voltage [V]
12 - N. of Poles [Hz]
13 - Weight [kg]
14 - Peak pressure [bar]
15 - Oil flow [l/min]
16 - Max line pull first layer Cargo [kg]
17 - Max line pull top layer Cargo [kg]
18 - Max line pull first layer LoP [kg]
19 - Max line pull top layer LoP [kg]
20 - First and top layer
21 - Speed rope first layer [m/min]
22 - Speed rope top layer [m/min]
23 - Manufacturer address

⚠ CAUTION

For no reason may the information printed on the plate be altered.

NOTICE

Refer the Serial Number of the system every time you contact the manufacturer for information or spare parts.

3.6 SPECIFICATIONS

3.6.1 MACHINE SPECIFICATIONS

The winch can be used for hoisting of loads or goods (cargo) and for lifting of personnel. The lifting of personnel configuration differs from the cargo configuration because the hoisting capacity is lower and the machine requires additional safety devices.

For all sizes grooved drums made by the special groove profile which improve the spooling performances as well as rope life-time are available. For sizes up to 7ton, a long drum version is available as well.

A wide range of accessories are available to improve safety as well as control of all winch functions.

For all sizes pressure roller, hydraulic or electric limit switch as last safety wraps indicator, electric or hydraulic rotary limit switch as minimum and maximum rope capacity indicator, speed sensor to have better control on spooling and other winch operation are available.

For all sizes the Lifting of Personnel (LoP) version due to a secondary brake directly connected to the drum which assure safety and control in all working condition is available.

The winches are designed to meet safety certification standards for major international organizations governing these applications. BWE-BWP winches are suitable for working ambient temperature between:

-20°C to +40°C.

NOTICE

If the machine is certified by a third party (marine environment, for example) the maximum load is identified by the relative certificate.

Ask Dana Motion Systems Italia srl for further info related any deviation from the information stated in this manual.

3.6.2 DIMENSIONS

The machine is supplied with the dimensions as per BWE-BWP catalogue. For actual dimensions refer to the dedicated dimensional drawing.

3.6.3 MOTOR SPECIFICATION

For motor specification please refer to the dimensional drawing of the specific machine or to the catalogue of the winch.

3.6.4 POSITIONING ON THE FINAL STRUCTURE

For the specifications relating to the fixing of the winch to the structure, refer to the dimensions of the specific machine or to the catalog of the winch.

3.6.5 HYDRAULIC AND ELECTRIC CONNECTIONS

For the hydraulic and electric data connections, refer to the dimensional drawing or to the catalogue of the winch.

3.6.6 ROPE

The machine can be supplied with rope already assembled or to be assembled. If it is not equipped with a rope, the installer will choose the correct rope based on the type of winch and loads to be lifted.

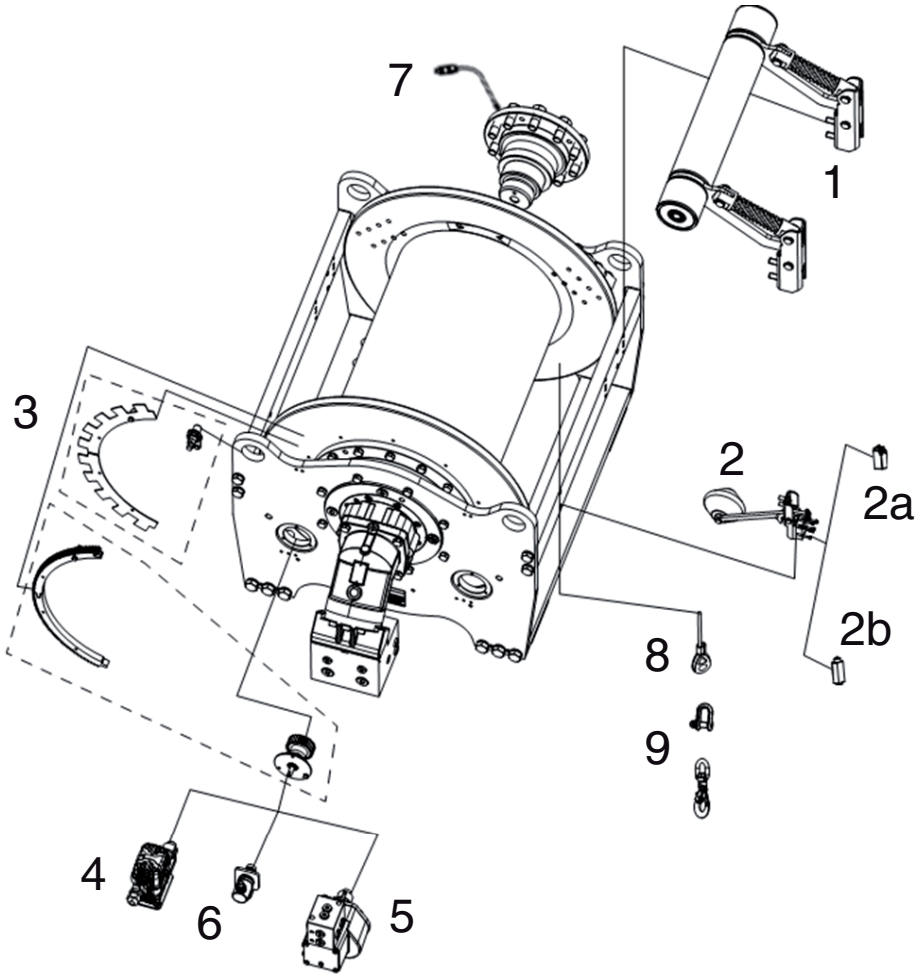
For the rope specifications see the CE certificate of the single rope when supplied with the machine.

3.6.7 SHACKLE AND HOOK

The winch can be supplied with hook and shackle according to customer needs.

3.6.8 OPTIONALS

The machine, both cargo and lifting of personnel, can be supplied with the following optional:



1 - Pressure roller
2 - Minimum rope capacity limit switch:
- **2.a** Electric micro-switch
- **2.b** Hydraulic micro-switch

3 - Phonic wheel (proximity sensor to detect speed of winding/unwinding)
4 - Min/Max rotative electric limit switch (min/max rope capacity)
5 - Min/Max rotative hydraulic limit switch (min/max rope capacity)
6 - Encoder (position and speed)
7 - Torque Sensor
8 - Rope
9 - Shackle and hook

The optional items are supplied on request and allow the creation of winch safety functions. The user must then assemble the systems to the safety circuits of the machine where the winch will be used.

NOTICE

The machine must be integrated by the installer with suitable safety circuits according to the applicable technical standards.

⚠ CAUTION

According to provisions of the Machinery Directive 2006/42 CE, the winch must be equipped with a load control system for working load of not less than 1 000 kilograms or an overturning moment of not less than 40 000 Nm.

⚠ CAUTION

The machine must have a control system for the minimum and maximum capacity of the rope.

⚠ CAUTION

Lifting of Personnel

In the case of lifting people, the winch is supplied with a maximum capacity for people lifting. The user must identify the number of people the machine can lift. Generally, the weight of each person is set at 80 kg (applies to European EN standards).

⚠ DANGER

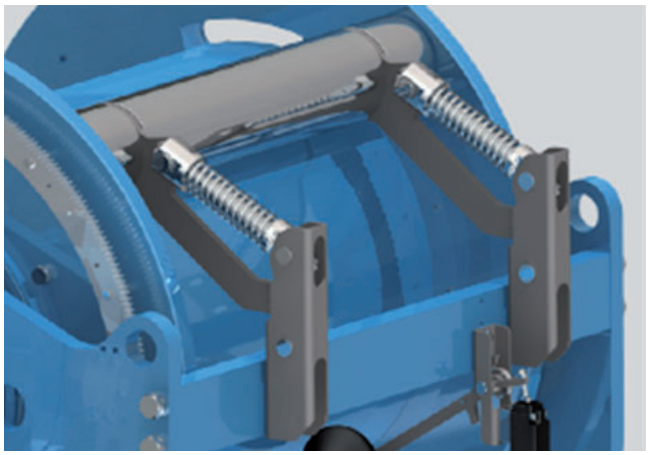
The installer must integrate the safety-related systems if not supplied with the winch. All the necessary controls must be implemented to guarantee the control of the overload and of the minimum and maximum capacity in addition to the other functions required by the product standards.

⚠ DANGER

Maximum lifting capacity indicated in the name plate shall not be exceed.

3.6.8.1 PRESSURE ROLLER

The pressure roller is a device engineered to avoid the loosening and the self-unwinding of a slack rope from the drum. It ensures the rope not going out of the drum flanges and it easies the correct winding of the rope on the drum and is highly recommended when there is more than one layer of rope wounded on the drum.



⚠ CAUTION

The installer must install the pressure roller to prevent the rope from exiting the drum, if not supplied.

3.6.8.2 MINIMUM ROPE CAPACITY CONTROL

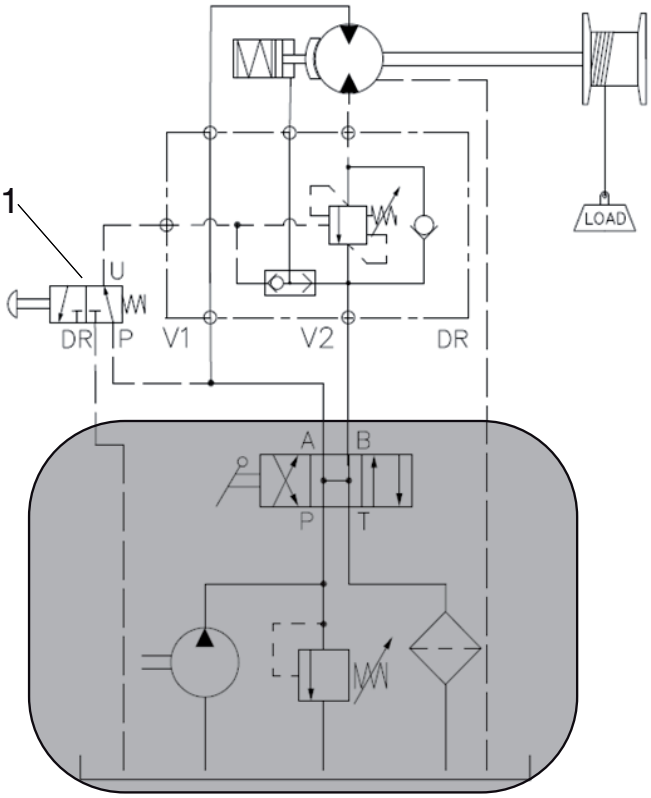
This safety device is engineered to avoid the full unwinding of the rope from the drum: a minimum of 3 (three) windings shall always remain on the drum. Limit switches are mandatory for lifting applications but they are only fitted if requested: if not supplied, it is demanded to the installer to provide for them.

The system is composed of a lever with a roller kept in touch with the drum and the rope by a spring-loaded mechanism. When the lower limit is reached, the micro switch, pressed by the lever, is activated and provide a signal to safely and immediately stop the machine.

This device can be supplied with electric o hydraulic microswitch and in both cases prior to delivery, the clicking mechanism is pre-set by DANA with the roller touching the drum. The installer shall double check the correct setting any time maintenance is needed or as per first installation.

The electromagnetic microswitch is with one normally open NO + one normally closed NC snap action contact blocks. NC circuit should be used for safety circuit and the electric signal coming from the microswitch shall be appropriately used by the installer to stop the machine safely.

The hydraulic microswitch (1) is a normally closed valve that allows a pressure signal, coming from the motor, to open the brake and to pilot the over center valve while hoisting and lowering. When the rope has come the last allowable windings, the microswitch is activated and it opens the circuit, stopping the pressure signal, and at the same time deviating the pressure remained in the brake and in the over center pilot signal to the tank (dropping this signal to zero). Below a suggested hydraulic scheme as reference.



NOTE:

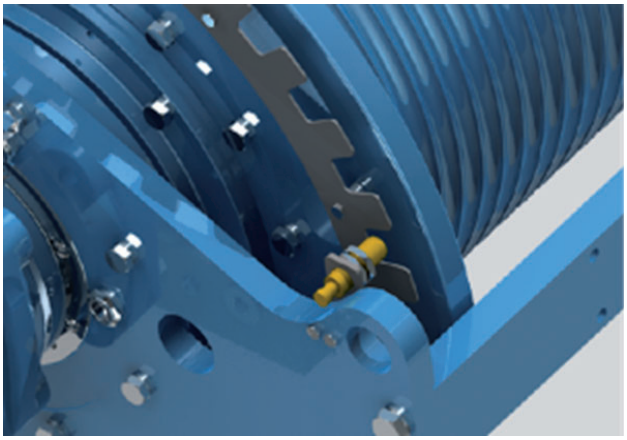
Enclosed items are not scope of supply.

DANGER

A minimum of three (3) windings shall always remain on the drum, otherwise the rope can break and the load drop. The installer shall provide for a safety device to ensure this control, if not already present on the machine.

3.6.8.3 PHONIC WHEEL AND PROXIMITY SENSOR

A stainless-steel proximity sensor is used to read the rotational speed of the drum, providing the user an information of the rope winding speed.



Characteristics:	Details:
Voltage supply	10..30 V DC
Residual current	0.1 mA for open state
Switching frequency	300 Hz
Voltage drop	2 V at closed state
Current consumption	10 mA at no-load
Connections	4 pins M12 male connector

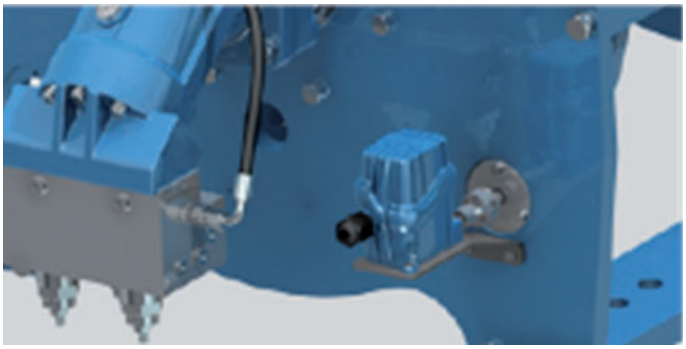
3.6.8.4 MIN/MAX ROTATIVE ELECTRIC LIMIT SWITCH (MIN/MAX ROPE CAPACITY)

This device is engineered to ensure that the minimum number of wraps is always present on the drum for safety reason, to avoid rope breakage causing the fall of the load.

Rotative switches also ensure that the maximum rope capacity of the drum is not exceeded.

NOTE:

The two cam mechanisms are NOT pre-set by DANA, the installer shall proceed to the correct setting at the first rope installation and any time maintenance is needed.



Characteristics:	Details:
Utilization category	AC 15 /250 Vac / 3A
Rated thermal current	10 A
Rated insulation voltage	300Vac
Connections	Screw-type terminals with self-lifting pads

For safety reason a dedicated version of this accessory is also available: reliability of the electric limit switch system achievable: SIL1.

Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.

⚠ DANGER

A minimum of three (3) windings shall always remain on the drum, otherwise the rope can break and the load drop. The installer shall provide for a safety device to ensure this control, if not already present on the machine.

3.6.8.5 MIN/MAX ROTATIVE HYDRAULIC LIMIT SWITCH (MIN/MAX ROPE CAPACITY)

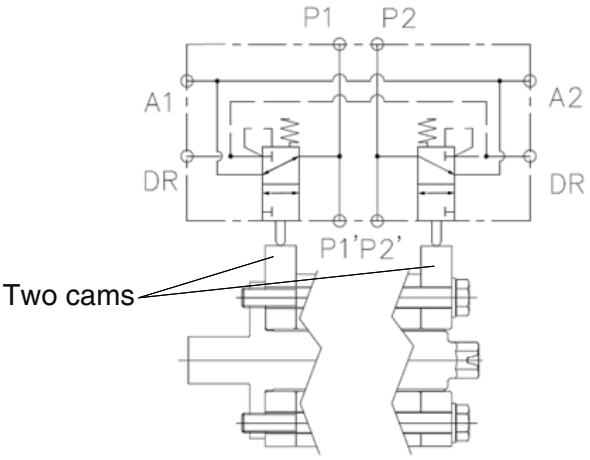
This device is engineered to ensure that the minimum number of wraps is always present on the drum for safety reason, to avoid rope breakage causing the fall of the load.

Rotative switches also ensure that the maximum rope capacity of the drum is not exceeded.

Characteristics:	Details:
Max flow rate	5 l/min
Max pressure	350 bar
Connections	G1/4

The two cam mechanisms are NOT pre-set by DANA, the installer shall proceed to the correct setting at the first rope installation and any time maintenance is needed.

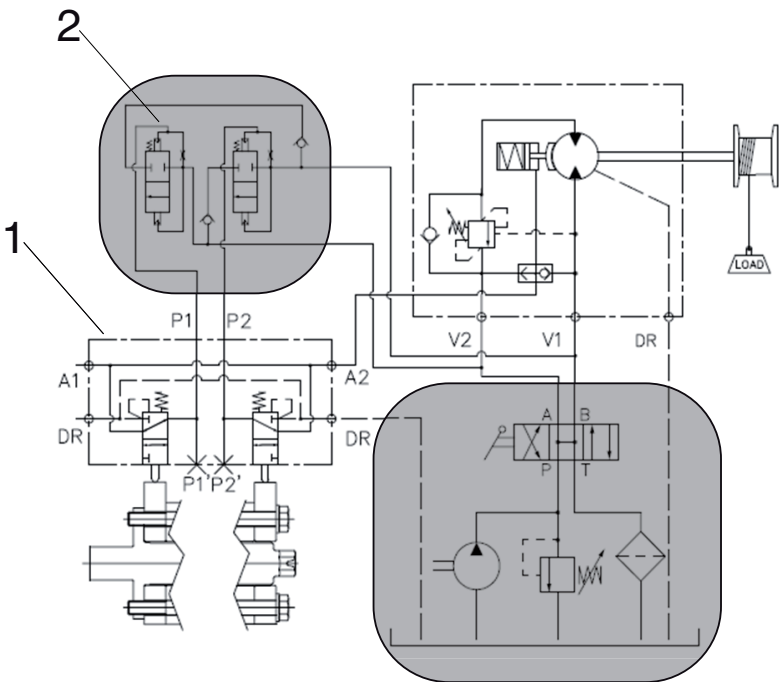
The rotative hydraulic limit switch provides the installer with two different pressure signals (P1 and P2 or P1' and P2') that shall be integrated in the complete hydraulic circuit of the machine to safely stop the machine when minimum or maximum rope capacity is reached.



A suggested scheme is here below illustrated:

1 - Min/max rotative hydraulic limit switch

2 - Logic valves



NOTE:

Enclosed items are not scope of supply.

The ratio between ring gear and pinion is different among all sizes, specific information can be found on dimensional drawing and on dedicated instruction and maintenance manual.

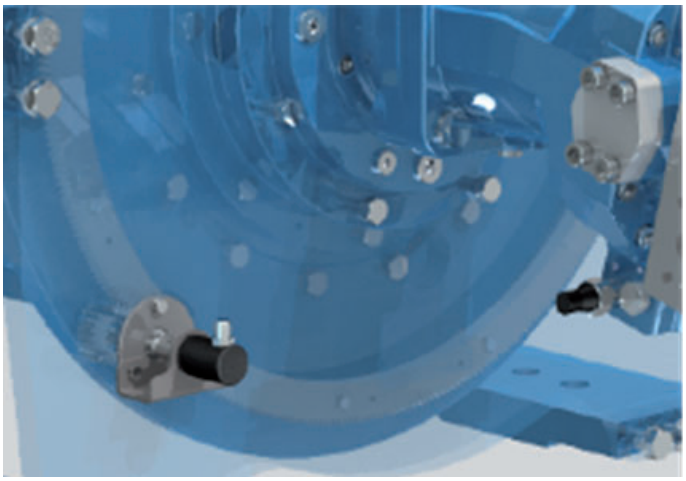
DANGER

A minimum of three (3) windings shall always remain on the drum, otherwise the rope can break and the load drop. The installer shall provide for a safety device to ensure this control, if not already present on the machine.

3.6.8.6 ENCODER (POSITION AND SPEED)

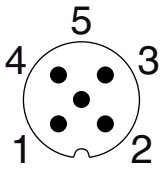
The encoder reads the speed and the rotation direction of the drum, providing information on the speed and length of the rope being wound or unwound. Using an absolute encoder is also possible to collect information about the length of the rope still on the drum or unwounded. It is also possible to have the rotative speed sensor on the Dana Motion Systems Italia srl Hydraulic Motor.

Encoder reading on the winch drum flange:



Characteristics:	Details:
Signal	4..20mA
Voltage supply	8..30V DC

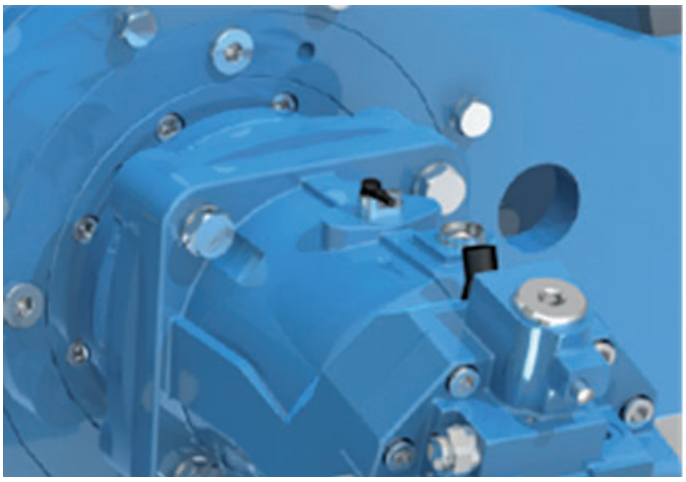
The sensor is supplied with a M12 connector with the following pin disposition:



1 - 0 V supply voltage
2 - +V supply voltage
3 - Analog output
4 - DATA VALID output
5 - Teach input

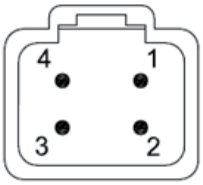
The ratio between ring gear and pinion is different among all sizes, specific information can be found on dimensional drawing.

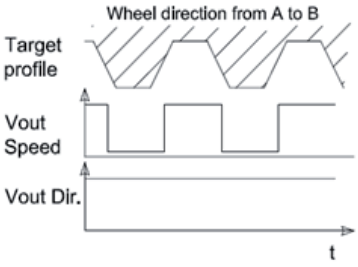
Encoder reading on the winch motor:

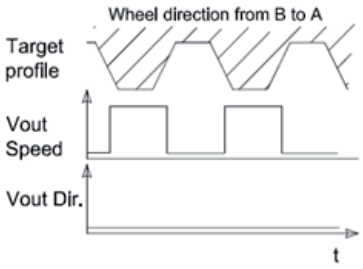


Characteristics:	Details:
Voltage supply	4.5..16V DC
Frequency range	0 + 20kHz

The sensor is supplied with a 3 meters DEUTSCH connector with the following pin disposition:





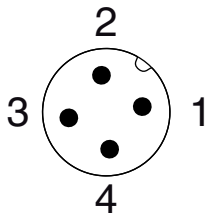


1 - +V supply voltage
2 - Out Speed
3 - Out Direction
4 - -V supply voltage

3.6.8.7 TORQUE SENSOR

The Torque Sensor is a system developed by DANA. It measures the reaction torque (output torque plus input torque) coming from the load being lifted and transform it in two 4..20mA signals that can be used to prevent the winch from lifting loads exceeding the maximum or from being subject to abnormal loads. These signals must be managed by the installer in the complete machine safety box as per below graph. A load limiter is mandatory for lifting applications and shall be applied by the installer, the Torque Sensor is fitted only on request.

The sensor is supplied with 150mm cable with a M12 male connector at the end with the following pin disposition:



1 - +V supply voltage
2 - -V supply voltage
3 - Output 1
4 - Output 2

Different arrangements are possible on request and will be displayed on relative dimensional drawing.

Characteristics:	Details:
Maximum power supply	9-33 Vdc
Output 1 Output 2	4..20 mA:
	4mA @ 0% rated load torque
	17.33mA @ 100% rated load torque
	20mA @ 120% rated load torque
Insulation	>5 GΩ

Output 1 and Output 2 have the same value and can be used for redundancy.

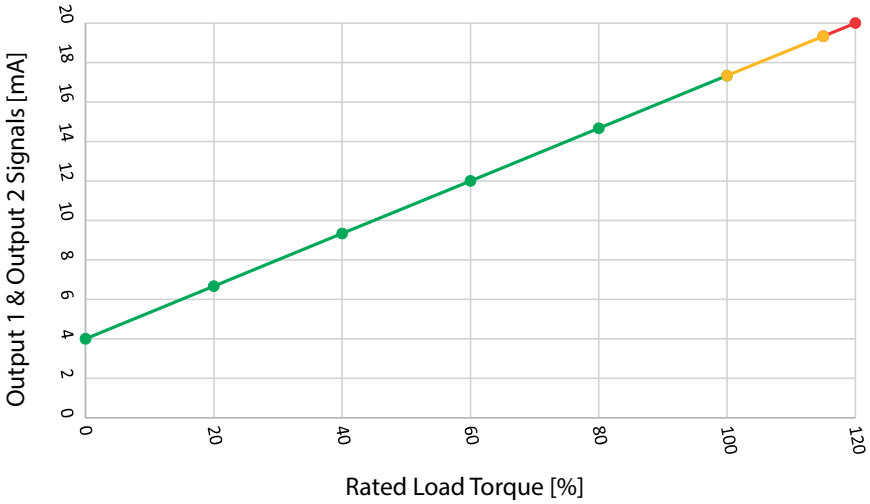
Both outputs indicate a value proportional to torque, according to the graph below.

Values are referred to condition with rope in the middle of the first layer on the drum.

Rated load torque is the nominal load torque used for the design of each machine size, installer must refer to catalogue values or related dimensional drawing. For different values and for winches with overall gear ratio lower than 10, contact Dana Motion System Italia S.r.l.

The system is protected against:

- polarity inversion (without time limit)
- output short circuit (to ground or to power supply)



3.6.9 AIRBORNE NOISE

According to 2006/42/EC, the noise level emitted is 88dB(A) measured by the manufacturer. It is largely depending on where the winch is installed, so the final installer should evaluate the final noise level and, according to the application, prescribe the correct use of PPE (Personal Protection Equipment).

For winches refer to attachment K of the EN14492-2.

⚠ CAUTION

Increased noise may indicate malfunctioning of the machine. In this situation, stop the machine and perform the necessary checks.

⚠ CAUTION

Whenever the machine is used in a noisy environment, PPE (personal protection equipment) need to be worn according to the working environment risks (safety manager).

3.6.10 VIBRATIONS

The machine does not create vibrations that put the health of operators at risk or that disturb machines installed nearby.

⚠ CAUTION

Increased vibration may indicate malfunctioning of the machine. In this situation, stop immediately the machine and perform the necessary checks.

3.6.11 ELECTRO-MAGNETIC FIELD

The electro-magnetic fields that have been detected are within the standard.

The Torque Sensor is compliant with EN 6100-6-2 and EN6100-6-3; other electric components have been designed according to the required standards and are not affected by electromagnetic fields.

4 SAFETY RULES



⚠ CAUTION

The machine is supplied without guards.

The final manufacturer of the assembly is responsible for supplying and installing all fixed and movable guards to prevent accidents in dangerous positions, except for those indicated in "10 Residual risks, page 86": for example, the exit area from the rope drum.

The final manufacturer of the assembly is responsible for installing properly all the other needed items (rope block, counterweight and hook). These items shall be in accordance with max lifting line pull of the machine.

These areas must be highlighted by applying safety labels that are easy to understand.

4.1 LIFTING OF PERSONNEL (LOP)

The machine, if equipped with the secondary brake, is designed for lifting of personnel and this configuration is clearly stated in the machine description (LP present) and related safe working load are expressed on the name plate in their related columns.

Operation in lifting of personnel (LoP) is a winch configuration and shall be managed by the installer with appropriate controls and overload management systems that depend on the type of application desired.

The reliability of the control system will depend on the technical applicable standard.

The machine, for lifting of personnel, has been sized for a maximum capacity less than the capacity of lifting goods and loads (cargo): the installer shall identify the maximum number of people that can be lifted based on the maximum capacity of the machine that is identified on the name plate. The maximum number of people shall be calculated also considering the shuttle that hosts them.

NOTICE

The machine must be integrated by the installer with suitable safety circuits according to the applicable technical standards.

⚠ CAUTION

According to provisions of the Machinery Directive 2006/42 CE, the winch must be equipped with a load control system for working load of not less than 1 000 kilograms or an overturning moment of not less than 40 000 Nm.

⚠ CAUTION

The machine must have a control system for the minimum and maximum capacity of the rope, it is advised to have a redundancy of this control system.

⚠ CAUTION

In the case of lifting people, the winch is supplied with a maximum capacity for people lifting. The user must identify the number of people the machine can lift. Generally, the weight of each person is set at 80 kg (applies to European EN standards).

⚠ DANGER

The installer must integrate the safety-related systems if not supplied with the winch. All the necessary controls must be implemented to guarantee the control of the overload and of the minimum and maximum capacity in addition to the other functions required by the product standards.

⚠ DANGER

Maximum lifting capacity indicated in the name plate shall not be exceed.

4.2 PERSONAL PROTECTION EQUIPMENT (PPE)

Should it be necessary for operational or servicing reasons to work on the system manually, operators must wear the necessary Personal Protective Equipment, namely:

Pictogram	Description
	Heat and mechanic resisting gloves
	Non-slip safety- footwear
	Helmet
	Protective glasses
	Ear protective muffs

4.3 RESIDUAL RISK

4.3.1 UNEXPECTED / ACCIDENTAL MACHINE STARTING

The relevant risk is avoided by instructing the operator concerning the practices to follow in this event:

- in the event of any maintenance work, inform the person in charge to prevent any accidental starting of the machine

4.3.2 DANGER OF ENTANGLEMENT AND CRUSHING

⚠DANGER

In the rope winding area, there is a risk of entanglement and crushing.
Do not approach this area during all the operations.
Don't use loose-fitting clothes.
The pressure roller can cause crushing risk during the cable assembly / maintenance phases.
Make sure you have disconnected the power supply to the machine before working on the pressure roller.
Risk of dragging during the sensors adjustment phases.
Make sure you have disconnected the power supply to the machine before working on any sensor.

4.3.3 DANGER OF FALLING OBJECTS FOR HUMAN ERROR

⚠DANGER

Danger of falling objects due to an unexpected unhook of the load in an instable situation of the load itself.
Keep a safety distance of at least 10 meters.
Danger of hooking of firmly secured objects (such as railing …) or of people standing in the working zone.
Keep a safety distance of at least 10 meters.
Do not stand under the load during load lifting / lowering operations.
Keep a safety distance of at least 10 meters.

4.3.4 EXTREME TEMPERATURE

⚠WARNING

During the maintenance phases pay attention to the metal parts which are still hot and may burn.
Wait for the machine to cool down before intervening. The temperature needs to be below 30°C.
Use PPE (gloves and protective glasses).

4.3.5 EMERGENCY

The installer shall install an emergency stop function with category 0 and shall interrupt directly the main hydraulic circuit and to guarantee the correct operation of all the safety devices as prescribed in EN14492-2, § 5.11.6.1.

The operators of the winch must be instructed about the location of the emergency stop(s).

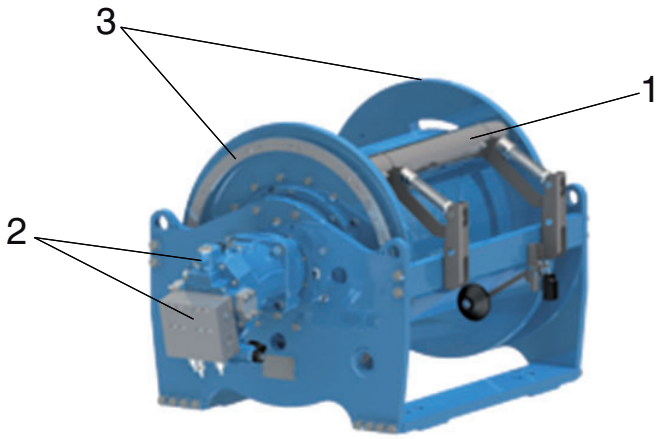
⚠WARNING

The emergency stop(s)may only be used during emergency situations.
The functioning of the emergency stop(s) must be checked frequently.

In case of a power failure a lifting of personnel winch must be capable to be lowered with a secondary power source: the installer or end user is responsible to provide a secondary power system to be able to lower the winch in case of a failure of the main power supply.

4.4 DANGER ZONES

Danger zones are indicated on the following picture in the complete machine.



1 - Entanglement and crushing
2 - Extreme temperature
3 - Rotating elements
4 - Friction between rope, drum and accessories

⚠WARNING

The loading and unloading area of the load should be considered as possible danger area.

Conformity

The system meets the following specifications:

- EN 61000-6-2 and EN 61000-6-3

4.5 WORKSTATION

NOTICE

During all operations appropriate lighting must be guaranteed according to the correct use (see EN12464-1 and 2).

The working area where the machine is installed should implement a correct protection against electric shock, or lightning to preserve the complete integrity of the machine and respect all safety conditions.

5 TRANSPORT AND HANDLING



Winches are packed and shipped in crates or on pallets on a case-by-case basis.

⚠WARNING

All handling and lifting operations must be performed in compliance with the safety and accident-prevention rules in force.

In order to ensure safe use of the machine, it is assumed that the reader has knowledge of the contents of section "1 General Information, page 7"before reading this chapter.

Specific instructions for interacting safely with the machine during maintenance are also detailed in the following paragraphs.

This chapter describes the procedures to be adopted for lifting, moving and handling the machine to safeguard both the machine and the personnel involved.

5.1 MACHINE PACKAGE

The packing methods are defined with the Customer in relation to the distance and the chosen means of transport.

The weight and dimensions of the packaging are indicated in the transport documents or on the packaging itself.

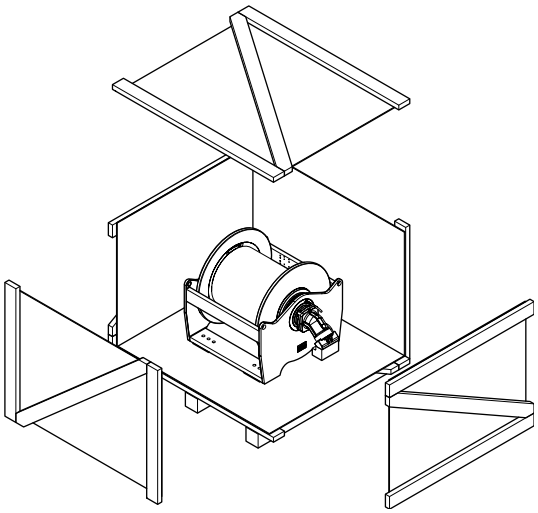
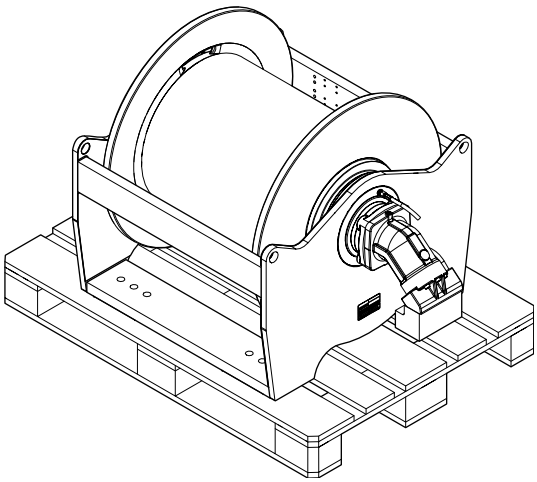
When the winches arrive, check that the items supplied match the items stated in the purchase order and that the packing and contents have not been damaged during transport.

Depending on the agreements made with the User, the machine can be packed in a wooden case, a wooden crate (cage) with cardboard or on a pallet.

To ensure that during transport no component inside the package can be damaged in any manner, the mobile parts have been secured by means of fastenings and the most delicate parts have been additionally protected.

For transport purposes, the most exposed parts of the system may be protected by means of waterproof materials or placed on a wooden pallet and secured to it with straps or ties to obtain a single sturdy unit.

Stacking is allowed up to 2 packages or max 1 ton of the stacked item.

5.2 STORAGE

The machine must be stored:

- in an indoor environment, dry and with no dust;
- in environments where ambient temperature is between -5°C and +30°C;
- in environments protected from sunlight;
- in environments where there are no mechanical vibrations;
- in environments dry and protected from weathering, with no condensation at all;
- in a non-submerged or semi-submerged place;
- in a non-explosive or potentially explosive environments and areas where there is a risk of fires.

For storing periods longer than 2 months check regularly general conditions of all the components and of the packaging.

⚠ CAUTION

Any deviation from the above-mentioned specifications calls for a specific written authorization by the Manufacturer.

Any modification that has not been authorized by the Manufacturer, that alters the functions of the machine and consequently modifies the risks and/or generates additional ones, will be made at the exclusive responsibility of the person/company making that modification.

Should these modifications be made without the manufacturer's authorization, any warranty, and the declaration of conformity issued by the Manufacturer in accordance to Machine Directive 2006/42/EC will be invalidated.

5.3 LIFTING AND HANDLING THE PACKED MACHINE

NOTICE

Lifting, transport and handling must be entrusted to the appointed head person and to qualified staff (crane operators, etc.), which must be assisted on ground by an expert person that can give the necessary instructions.

Such personnel should be perfectly aware not only of the general safety regulations in force in every country but also of the safety regulations relating to the machine, which are provided in this manual.

⚠WARNING

The instructions below are to be scrupulously adhered to, since such operations entail potential hazards.

Make sure that the lifting, transport and handling equipment features have an adequate load-bearing capacity that is suitable for the package's weight.

Any other system for lifting, transport and handling that has not been recommended by Dana Motion Systems Italia srl will invalidate the insurance covering damage to the machine and/or any additional ancillary equipment.

Should the dimensions of the package prevent the operator from having perfect visibility during the lifting, transport and handling operations, it is advisable that two operators be in attendance on the ground to check for possible hazards or obstacles against which the package could collide.

The lifting equipment used must have a capacity suitable to the total weight of the package shown on the package itself.

The package must be handled in compliance with the following guidelines:

- No sudden movements.
- Except when stopping and starting, there must be no abrupt acceleration or deceleration.
- Stop before changing direction (if a crane or overhead travelling crane is used).
- As far as possible, when the package is lifted, keep it away from any obstacles and as near to the ground as possible.
- The safest route must be chosen before lifting the machine.
- Never allow anybody to pass under or stand underneath hanging loads.
- Handling speed should be assessed based on the forces of inertia developed by the starting and stopping movements, as these forces cause additional pulling strain on the chains or ropes and create load swinging. This speed does not only depend on the machine's weight, but also on the type of crane or fork-lift truck, the dimensions and resistance of the slinging tackle and the presence of any obstacles.
- The load must be lowered slowly to the ground to avoid damaging the more delicate components.

NOTICE

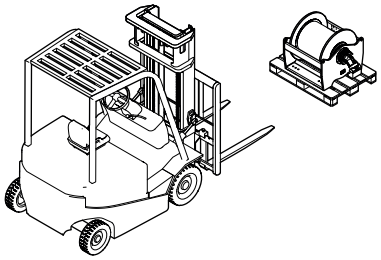
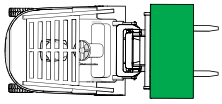
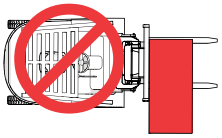
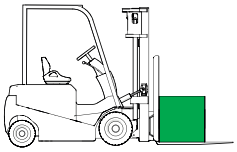
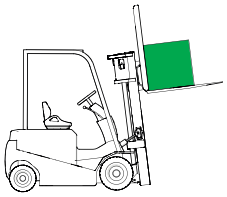
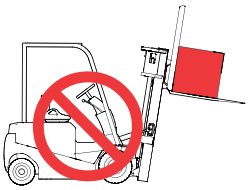
When the packs reach their destination, check their condition and the condition of their contents at the presence of the carrier. Compare the supply with the packing list delivered with the machine (shipping documents).

5.3.1 LIFTING AND MOVING THE PACKAGE WITH A FORKLIFT TRUCK

Before lifting the package with a forklift truck, make sure that the truck can withstand and carry the gross weight of the package, which is indicated on the package itself. The mass and the number of the components or accessories supplied is reported together with their serial number on shipping documents.

- Position the forks in the specific reference positions, which are marked out at the bottom of the package.
- Lift a little to make sure that the package is stable. You can now lift and move the package.

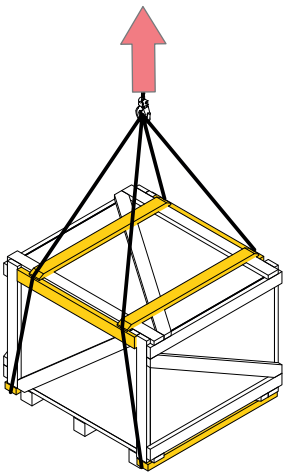
The figure here below illustrates how the package should be lifted using a forklift truck.

Lifting and moving the package with a forklift truck	OK	NOK!
		
		
		

5.3.2 LIFTING THE PACKAGE WITH A CRANE

To lift the package with a crane, you must use chains/slings that must be capable of withstanding the gross weight of the package, which is indicated on the package itself.

- Harness the package by positioning the chains/slings in the positions that are marked out on the package.
- Use suitable metal reinforcements at the bottom and top to prevent the chain / sling from damaging the cage in the upper part, use struts to reduce the risk of damaging the wooden structure.
- Once the ends of the chains have been hitched onto the hook, lift slowly until the chains are completely taut.
- Make sure that the crane's hook is in correspondence with the symbol identifying the package's center of gravity and check that the chains are correctly positioned.
- You can now raise the package until it has been lifted off the floor.
- During this phase, two operators should be assisting to guide the package laterally throughout the entire lifting operation and prevent the load from swinging or shifting abruptly as this could give rise to extremely hazardous situations.
- After lifting the package, move it to the place in which it will be opened.



⚠WARNING

Place sturdy and compression resistant bars across the top and bottom of the crate before lifting it; ropes or chain can damage the crate and its content.

5.4 STORAGE OF PACKED MACHINE

If the machine must be stored for more than 2 months, do the following:

- Protect all unpainted parts with a film or grease and/or rust-inhibitor liquids
- Completely fill the winch and any multi-disk brake with suitable oil
- Store the machine in a cool place at an ambient temperature ranging from -5°C to +30°C
- Protect the machine against dirt, dust and moisture
- Replace the lubricating oil in the winch when the storage period exceeds the shelf life of the lubricating oil.

After carrying out the above-mentioned operations, cover the machine with waterproof wrapping.

Repeat these operations every 12 months, throughout the entire storage period and check its storage condition on a regular basis.

After extended storage of more than 6 months, the rotating seals could become inefficient. It is recommended to periodically turn the winch drum by rotating the drum to keep the seals flexible. When a negative brake is mounted, release the brake prior to the drum rotation with the hydraulic circuit used to make the machine rotate or with a hydraulic pump or similar device (refer to catalogue or dimensional drawing for the brake opening pressure).

NOTICE

After six months of storage, the efficiency of the rotating seals and gasket cannot be guaranteed (check these regularly and, if necessary, replace them before putting the machine into service).

NOTICE

For information regarding storage of drive motors and other accessories that are supplied with the winch, refer to the relevant attachment in this manual.

Irrespective of whether the machine and the components packed with it are placed on a pallet or in a cage (not of the sea-worthy type), for transport to European countries belonging to the EU (European Union) or to nearby countries, plastic wrapping should be used to improve impact protection.

NOTICE

Storage times are not guaranteed for this type of package.

As far as sea transport is concerned, further to specific requests or in cases in which **Dana Motion Systems Italia srl** deems it necessary, the machine is enclosed within a protective package, inside which dehydrated salt bags are placed.

NOTICE

Storage times exceeding one year are not guaranteed by Dana Motion Systems Italia srl.

With regard to machines that are packed only on a pallet or inside a closed package that is not sea-worthy, it is advisable (for long-term storage) to unpack the machine and keep it in a protected area, with an ambient temperature ranging from -5°C to 30°C, dry and protected from weathering. All unpainted parts of the machine must be protected with a coat of anti-oxidizing oil or grease and/or rust-inhibitor liquids. All sliding parts must be appropriately greased.

NOTICE

Unpacked machine must be positioned on a surface that is suitable for bearing its weight. Unpacked or partially unpacked machine must not be stacked.

5.5 UNPACKING

⚠WARNING

The packing strap is sharp. It may hit the Operator when cut.

The packing materials should be removed as follows:

- use gloves and protective glasses;
- cut the packing straps with snips (take care as the ends could hit the Operator);
- cut away, or pull off, the surrounding packing material;
- take the winches off the pallets.

NOTICE

Waste elements must be collected and disposed of using suitable containers for waste disposal; do not dispose of them freely in the environment as they may cause pollution and danger.

Unpacking operations do not call for particular care:

- if the machine is packed, simply open the case and remove any protective materials and ties that secured the machine or its parts in place during transport;
- if the machine is unpacked, remove the protective materials and ties that secured the machine parts in place during transport.

5.6 HANDLING THE MACHINE

NOTICE

Before lifting the machine, identify the mass of the machine to select the appropriate lifting system.

⚠WARNING

Make sure that the device used for lifting, transporting and handling the machine is suitable for the latter's overall weight, which is indicated in the nameplate. Any other system for lifting, transport and handling that has not been recommended by the manufacturer will invalidate the insurance covering damage to the machine and/or any additional ancillary equipment.

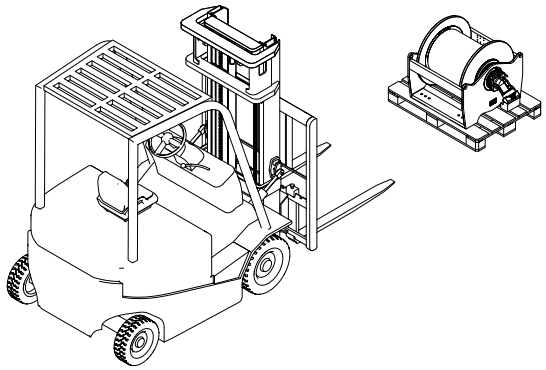
Should the dimensions of the machine prevent the operator from having perfect visibility during the lifting, moving and handling operations, it is advisable that two operators be in attendance on ground to check for possible hazards or obstacles against which the machine could collide. Also ensure that there is nobody standing in the transport areas and that there are no accessories or cables connected to the machine preventing movement or rendering transport dangerous.

The machine components are not perfectly balanced. They must be lifted in any of the following manners:

- with a forklift truck
- with slings and a crane
- with lifting lugs and crane

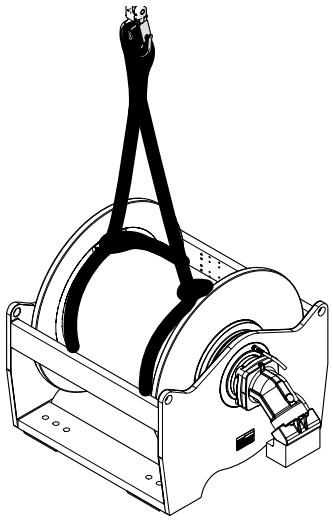
5.6.1 WITH A FORKLIFT TRUCK

- Place the forks under the frame, paying attention to protruding parts, in the positions indicated and as shown in the figure below.
- Lift a little to make sure that the package is stable.
- Let the forks swing a little to guarantee more stability during the handling maneuvers.
- You can now lift and move the unit.



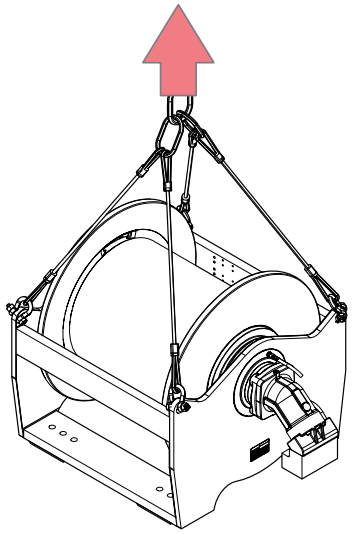
5.6.2 WITH SLINGS AND A CRANE

- Harness the machine by positioning the slings in the positions that are shown in the figure below.
- Once the ends of the slings have been hitched onto the hook, lift slowly until the slings are completely taut.
- You can now raise the machine until it has been lifted off the floor.
- During this phase, two operators should be assisting to guide the machine laterally throughout the entire lifting operation and prevent the load from swinging or shifting abruptly as this could give rise to extremely hazardous situations.



5.6.3 WITH LIFTING LUGS AND A CRANE

- Remove the wooden side wall from the package.
- Hook the winch by means of the two lifting lugs and chains or with the use of four lifting jugs.
- You can now raise the package until it has been lifted off the floor.
- During this phase, two operators should be assisting to guide the machine laterally throughout the entire lifting operation and prevent the load from swinging or shifting abruptly as this could give rise to extremely hazardous situations.



⚠ CAUTION

Make sure to neither rotate the winch in the direction where accessories are nor to lay it on the accessories side to prevent any damage to them.

5.7 LIFTING

Before lifting the machine, make sure that the forklift truck can carry the gross weight of it (see "3.5 Nameplate, page 19").

The weight of the machine is not balanced, therefore during handling operations, position the forks/slings as indicated by below images.

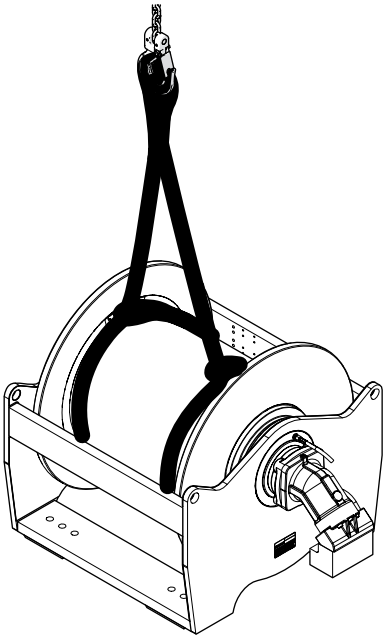
Lift a little to make sure that the machine is stable. You can now lift and move the package.

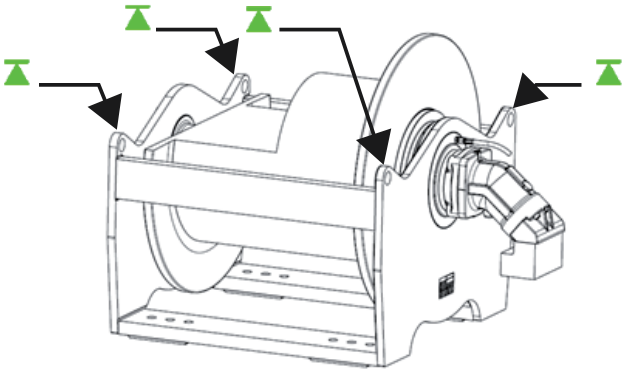
⚠ CAUTION

Do not tilt or overturn during lifting and transport.

NOTICE

While lifting and positioning the package, avoid any violent impacts or bumps.





For lifting procedures, strap the winch using two belts wrapped around the ends of the drum or attach it at indicated points if present.

5.8 TRANSPORT

Always make sure that the transported part is properly balanced; secure it to the means of transport in the safest manner possible by means of harnesses, ropes and/or hooks complying with the rules in force. During transport, prevent the load swinging since it may tip over and fall.

During transport, do not place any objects on the machine as this could lead to the irreparable damage of some of its parts.

⚠ CAUTION

The weight of the machine is not balanced: pay attention to load oscillations to avoid the risk of crushing and damaging the machine elements and any surroundings.

Accompany the load guiding it with a rope.

5.9 DISPOSAL OF PACKAGING MATERIALS

NOTICE

The packaging materials are to be disposed of by the user who should scrupulously comply with the Regulations in force in its country, as concerns the following materials:

· WOOD;

· NAILS;

· CARDBOARD.

· PROTECTION AGAINST DAMP (plastic film).

Should the user decide to keep all the parts of the package for future use or for moving the machine to another destination, all the packaging instructions provided in this manual should be followed.

6 INSTALLATION

6.1 GENERAL WARNING

Machine installation is a complex operation that gives rise to various risks; this operation is generally performed by the installer or by qualified technicians authorized by the same.

NOTICE

Please be informed that installation of machines is not at the care of Dana Motion Systems Italia srl. Therefore, the latter refuses any liability if the instructions are not followed.

6.2 AMBIENT CONDITION FOR USE

The machine has been designed and built for use in various climates, in non-explosive environments or potentially explosive ones, with the following ambient temperature and humidity:

Description	Minimum	Maximum
Ambient temperature	-20°C	+40°C
Ambient humidity	10%	50%

⚠ CAUTION

Before any use with load at ambient temperature below 0°C, the winch must be preheated by running it several times with no load. In other words, you have to make the winch wind and unwind some rope (i.e. 20 m for 5 times).

If the ambient temperature is between 0°C and -20°C, or if the last start was more than 3 hours earlier, you have to run the winch with no load as long as the hydraulic oil temperature is higher than -10°C in order to preheat the winch.

Use a laser thermometer to measure the temperature of the winch.

The winch cannot be used immediately after a 3 non-working hours period without being warmed up with no load.

NOTICE

During all operations appropriate lighting must be guaranteed according to the correct use (see EN12464-1 and 2).

Also make sure that your working environment fulfills the following requirements.

6.3 ENERGY SUPPLIES

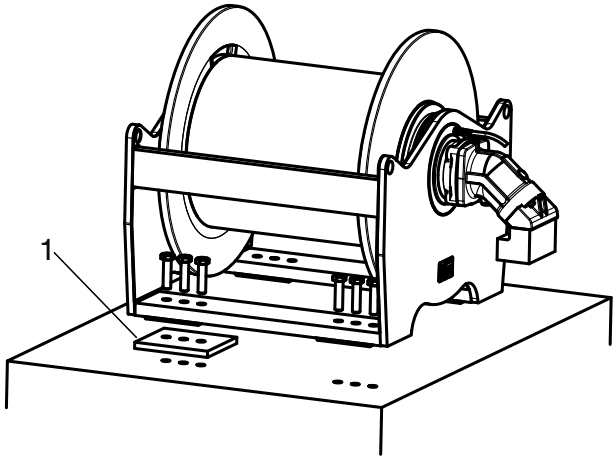
Supplies (electricity, oil, compressed air, etc.) must be direct and easy to access.

Hydraulic oil temperature must be higher than -10°C.

6.4 POSITIONING

The winch must be connected by means of its interface to the support provided by the user; the structure on which the machine is installed must be stiff and have a sufficiently large supporting surface. The winch must be secured in its final position by means of top-quality screws.

The supporting plate shall be flat and sturdy, and after placing the winch on top, check that the crossbars lies perfectly flat on the supporting plate. To avoid undue tension in the winch when the screws are tightened, if one crossbar is raised from the plate, insert a shim (1) to ensure correct contact.



It is recommended to use screws with a resistance class of 8.8 or 10.9. These must be wrenched according to the torque settings advised by the standards in force and indicated in the table below.

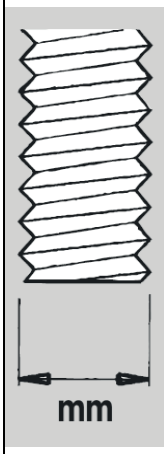
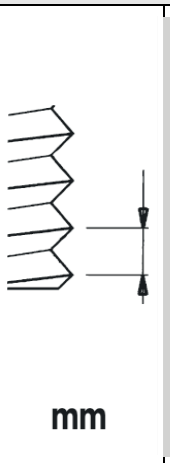
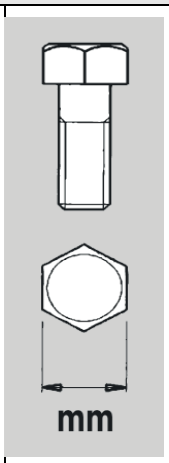
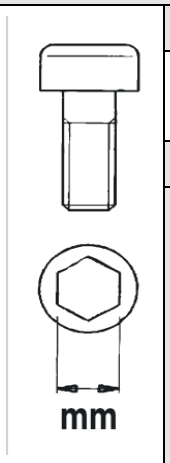
⚠ CAUTION

To ensure correct assembly, use the holes provided on the winch/application interface.

Attention: do not use the motor as lifting point.

The following table shows the tightening torque based on the nominal diameter of the screw.

6.4.1 TABLE OF TIGHTENING TORQUES RECOMMENDED

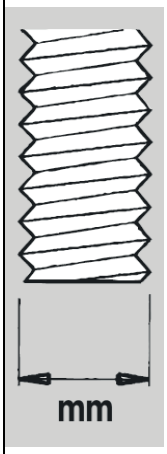
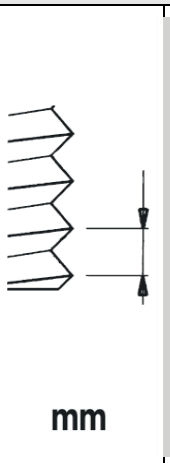
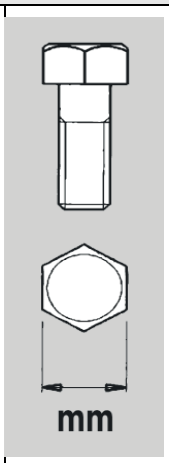
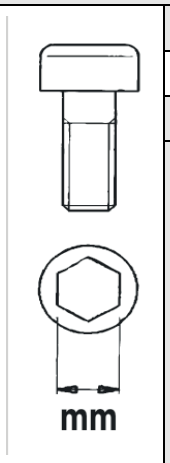
Recommended tightening torques wrench values									
				Screws class[1]					
				8.8			10.9		
							12.9		
				Recommended torque wrench [N·m]					
				TARGET	MIN	MAX	TARGET	MIN	MAX
M6	1	10	5	10.4	9.8	10.6	15.3	14.4	15.6
M8	1.25	13	6	25	23.5	25.5	37	34.8	37.7
M10	1.5	16	8	50	47	51	73	69	74
M12	1.75	18	10	86	81	88	127	119	130
M14	2	21	12	137	129	140	201	189	205
M16	2	24	14	214	201	218	314	295	320
M18	2.5	27	14	306	288	312	435	409	444
M20	2.5	30	17	432	406	441	615	578	627
M22	2.5	34	17	592	556	604	843	792	860
M24	3	36	19	744	699	759	1060	996	1081
M27	3	41	19	1100	1034	1122	1570	1476	1601
M30	3.5	46	22	1500	1410	1530	2130	2002	2173
M33	3.5	50	24	1980	1861	2020	2800	2632	2856
M36	4	55	27	2540	2388	2591	3600	3384	3672
							Revision		2011/05/10

[1] Class according ISO898-1:2009.

The fixing bolting connection can be composed of:

- passing through screw of adequate length, washer (with hardness at least HV300) under bolt head, washer under nut and self-locking nut
- screw with adequate engagement length in a blind hole.

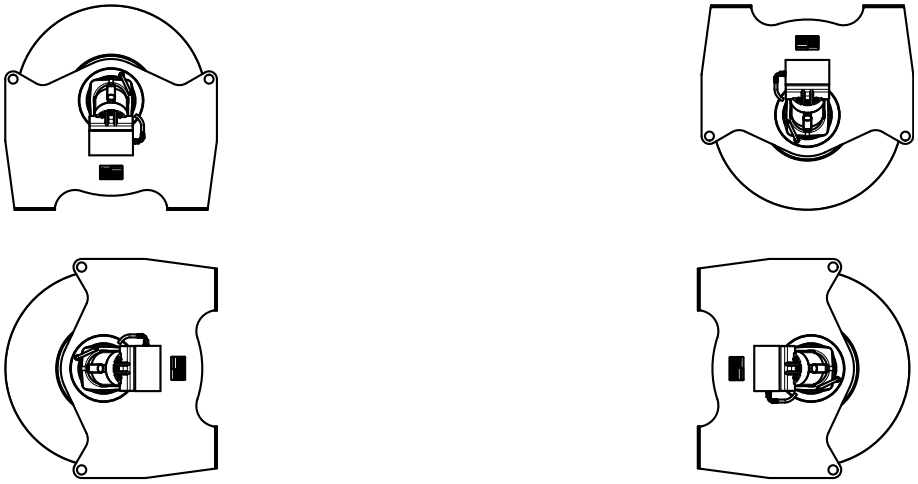
6.4.2 STAINLESS STEEL SCREWS TIGHTENING TORQUE

Recommended tightening torques wrench values									
				Screws class[1]					
				70			80		
				Recommended torque wrench [N·m]					
				TARGET	MIN	MAX	TARGET	MIN	MAX
M4	0,7	7	3	2,2	2,1	2,2	2,9	2,7	3,0
M5	0,8	8	4	4,2	3,9	4,3	5,7	5,4	5,8
M6	1	10	5	7,5	7,1	7,7	10,1	9,5	10,3
M7	1	11	-	12,3	11,6	12,5	16,4	15,4	16,7
M8	1,25	13	6	18,2	17,1	18,6	24,2	22,7	24,7
M10	1,5	16	8	36,2	34,0	36,9	48,2	45,3	49,2
M12	1,75	18	10	61,2	58	62	81,7	77	83
M14	2	21	12	98,1	92	100	131	123	134
M16	2	24	14	153	144	156	203	191	207
M18	2,5	27	14	211	198	215	281	264	287
M20	2,5	30	17	300	282	306	399	375	407
M22	2,4	34	17	414	389	422	552	519	563
M24	3	36	19	523	492	533	698	656	712
							Revision		2019/12/16

[1] Class according ISO3506-1:2009.

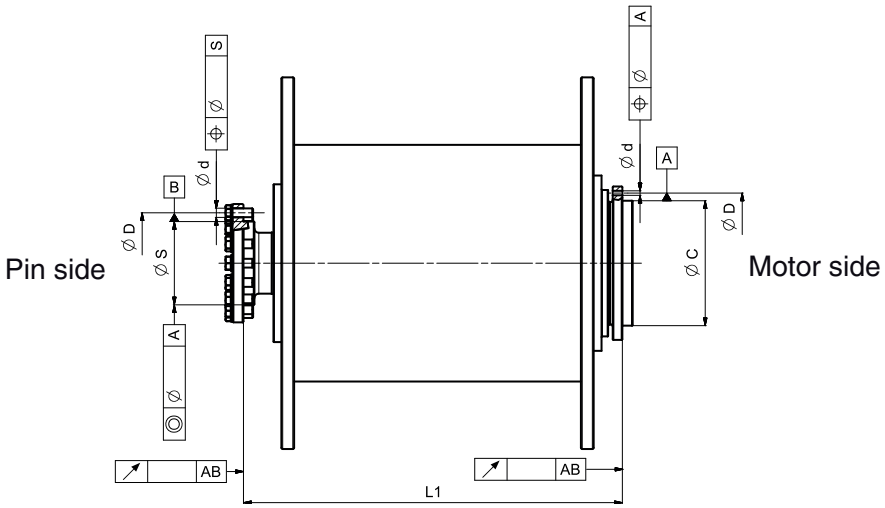
INSTALLATION

The winch can be mounted in four main positions: 0, +90, +180, +270 ° or in intermediate positions, depending on the user's requirements.



To mount geared-drum version, reference to the following notes should be followed in order to prepare the correct mating surfaces:

- The pilots and mating surfaces of the winch and its related structures must be clean, degreased and undamaged;
- Requirement for the structure manufacturing



Pin side			Structure Length	Motor Side	
AB	A	B	L1	AB	A
0.4	0.1	1.0*	250	0.1	1.0*
0.4	0.2	1.0*	500	0.1	1.0*
0.4	0.3	1.0*	1000	0.1	1.0*

NOTE:

*** Holes shall be 1mm larger than corresponding screw or thread diameter (d).**

NOTICE

The installer is responsible for installing suitable guards to comply with applicable safety standards in the country where the machine is used.

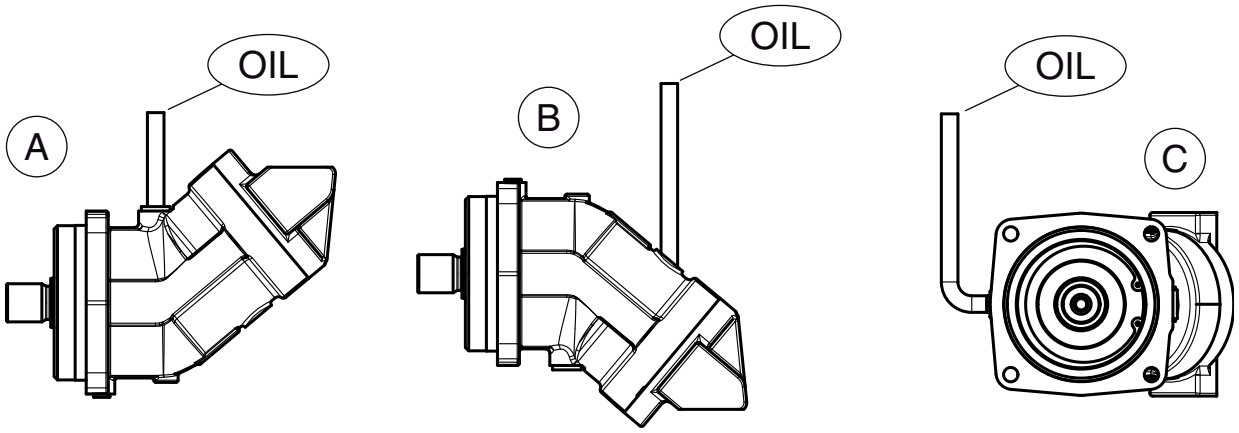
6.5 HYDRAULIC MOTOR ASSEMBLY

The motor mounting position can be in one of the following configurations:

a - horizontal I: drive shaft horizontal and casing bend upwards.

b - horizontal II: drive shaft horizontal and casing bend downwards.

c - at side: drive shaft horizontal and motor on one side.



The installation position and installation orientation determine the layout of the pressure, leakage (case drain) and bleed lines. Suction and drain lines should be as short and straight as possible and connected directly to the tank of the machine. Avoid elbows and sharp bends. When the unit is stopped, vertical lines will empty themselves over a period of time due to gravity.

⚠ CAUTION

Ensure proper filling of the motor case prior to starting the machine; check that drain lines avoid complete emptying of the motor.

In this respect, the varying viscosity of the fluids must be observed, higher viscosity fluids offer greater resistance to aspiration and fall more rapidly. In mobile applications, the arrangement of the tank is particularly important. Centrifugal forces when driving around bends, and inertia effects when accelerating or braking influence the inclination of the surface of the fluid. As the level of fluid in the tank falls, these effects must be taken into consideration. In general, and for all installation positions and installation orientations, the maximum pressure in the motor casing is 1.5 bar [21.75 psi].

6.6 ELECTRIC MOTOR MOUNTING

This installation and maintenance manual is devoted only to hoisting winches whose main motor is composed of hydraulic rotary actuators; for other types of motor, consult the **Dana Motion Systems Italia srl** technical service.

6.7 CONNECTION

6.7.1 HYDRAULIC CONNECTION

⚠ CAUTION

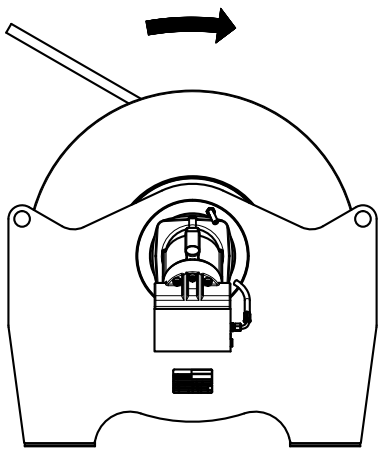
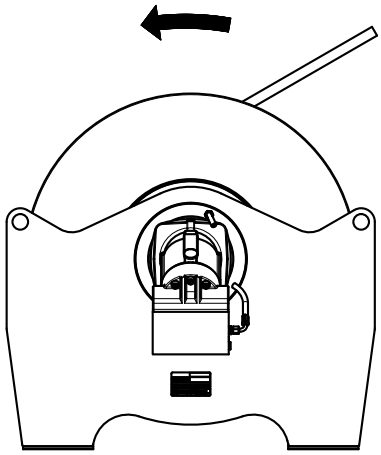
Pay attention to surfaces and lubricant: it may be hot.

Attention to the ejection of fluids.

Tighten the fittings and the hydraulic connections well. Be careful not to damage the hydraulic hoses.

The winch must be connected to the hydraulic circuit by using three hoses connected to inlets V1, V2 (power supply connection) and DR (drain). The pressure reducing valve drain must be connected when present. Follow the connection indications shown in the diagrams below to guarantee 01-02 rotation codes (the dimensions and the specifications of the couplings for connecting the pipes to the hydraulic motor are stated in the specifications sheet for each winch).

Viewing the machine from the motor side, 01 means lifting in clockwise direction, 02 means lifting in counterclockwise direction.

Drum rotation in hoisting direction	
	
Rotation 01: clockwise	Rotation 02: counter-clockwise

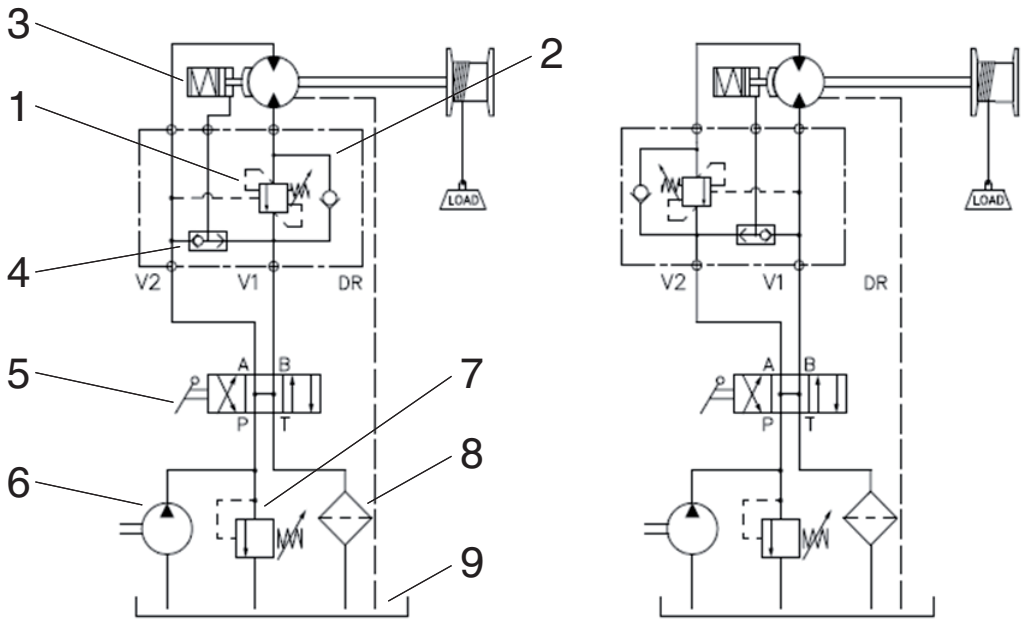
NOTE:

Arrows indicate HOISTING DIRECTION.

Pipelines must have an inner diameter of a suitable size in order to prevent undesired pressure drops and backpressure and a subsequent increase of pressure within the entire system.

Recommended hydraulic diagram for Cargo

On the left-side clockwise rotation 01 for hoisting giving pressure in V1, on the right-side counterclockwise rotation 02 for hoisting giving pressure in V2, both with external motor.

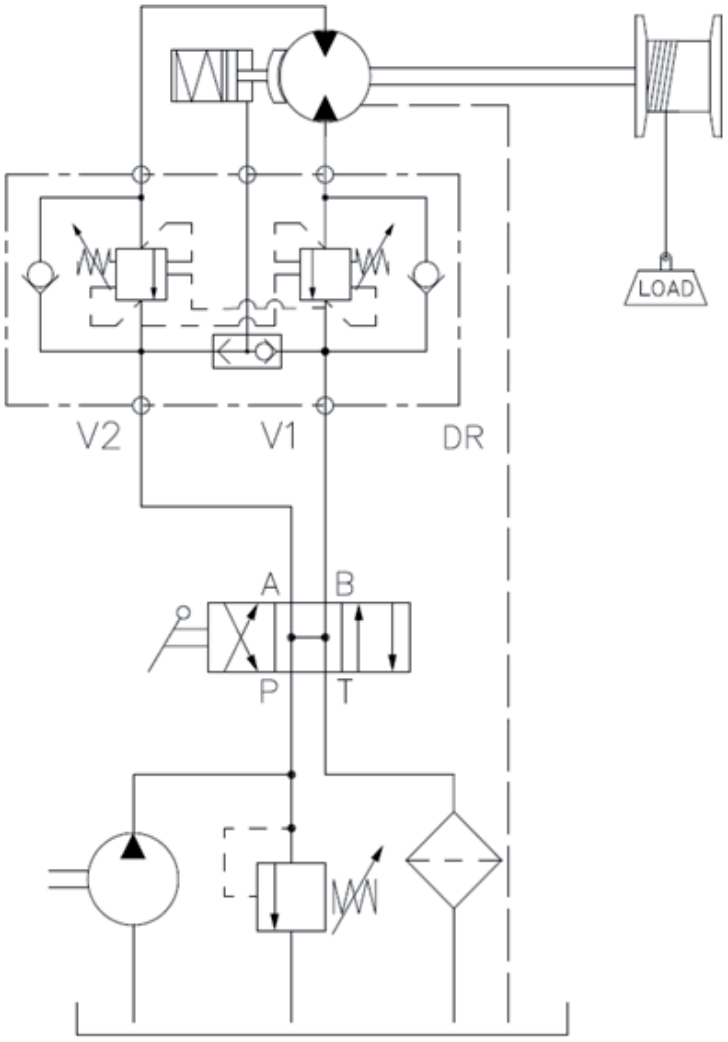


1 - Single overcenter valve
2 - Hydraulic motor
3 - Multidisc negative brake
4 - Shuttle valve
5 - Open center distributor valve *
6 - Pump *
7 - Max pressure relief valve *
8 - Filter *
9 - Tank *

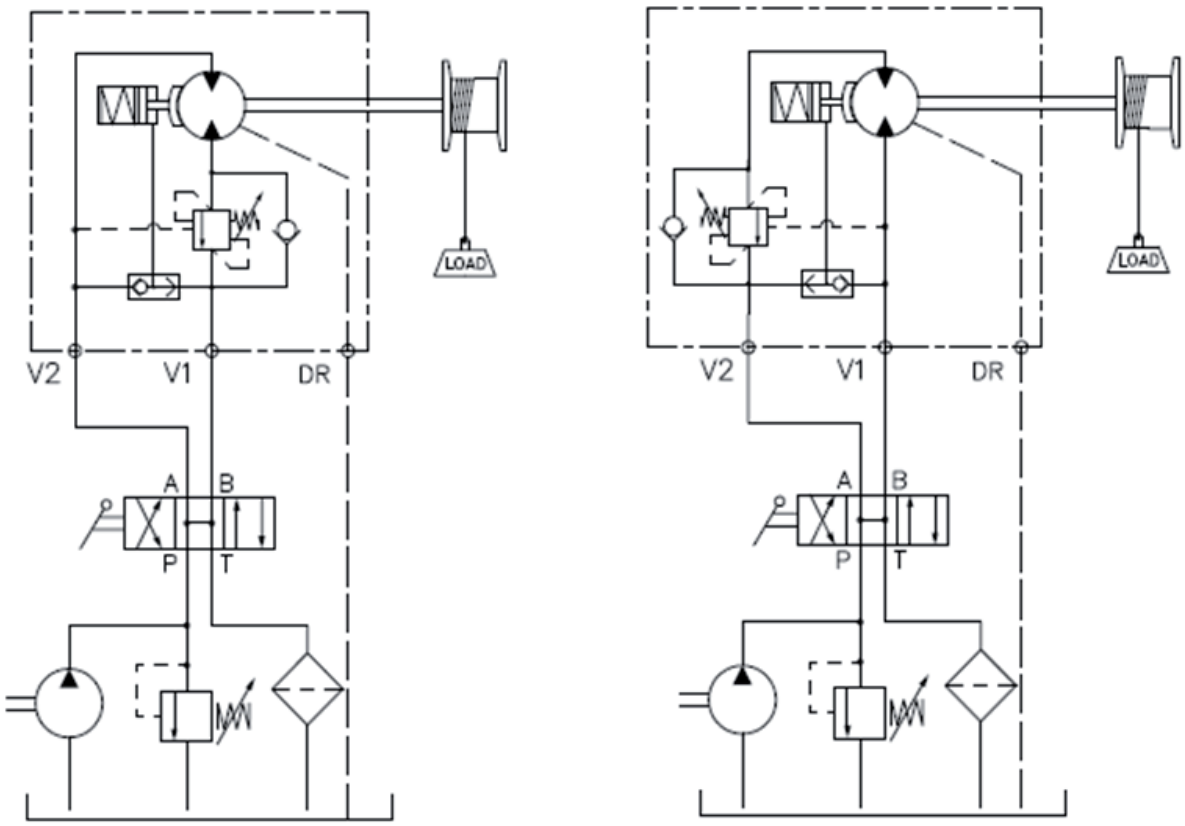
NOTE:

*** Parts not provided by Dana Motion Systems Italia srl.**

Below possible circuit with double over center valve, rotation 00.



BWE-BWP line comes also with integrated axial piston motor option, with hoisting rotation clockwise and counterclockwise, below possible circuit:



⚠ CAUTION

All components of the winch's hydraulic circuit must be good quality and suitable for operating at a pressure exceeding the maximum pressure indicated in the specifications sheet for each winch and as described in the nameplate.

For the winch's hydraulic circuit, use pipes and fittings with inner dimensions that are suitable for the oil flow rate shown in the table indicated in the specifications sheet for each winch.

Use oil-pressure winch control distributors which have V1-V2 drainage lines in neutral position (configuration H / open circuit), in order to prevent the negative brake from being accidentally disengaged by any hydraulic pressure remaining in the pipes when the winch is stationary.

If the distributor has multiple elements, connect the winch to the last element closest to the outfeed side.

⚠ WARNING

During normal winch operation, the primary negative brake will be automatically disengaged by means of the hydraulic motor's supply pressure. When the motor stops, and hydraulic pressure is reduced to zero, a set of compression springs are activated to generate, in combination with the brake discs, static braking torque.

The residual pressure of the brake piston must not rise above two (2) bar.

The lifting of a load applied to the winch rope must never make use of the hydraulic jib of the crane where the winch is installed. In this case, the pressure relief valve may not be able to protect the winch against dangerous overloading.

It is strictly PROHIBITED to tamper with the pressure relief valve.

Make sure the hydraulic circuit is of the correct size and there is a safety device to avoid air bubbles during working.

Prior to the first start of the machine, check the pressure in the return line of the circuit; to perform this measurement, disconnect the two main pipes from the valve and connect them with a T shaped fitting carrying a pressure gauge with a maximum scale of 50 bar.

NOTICE

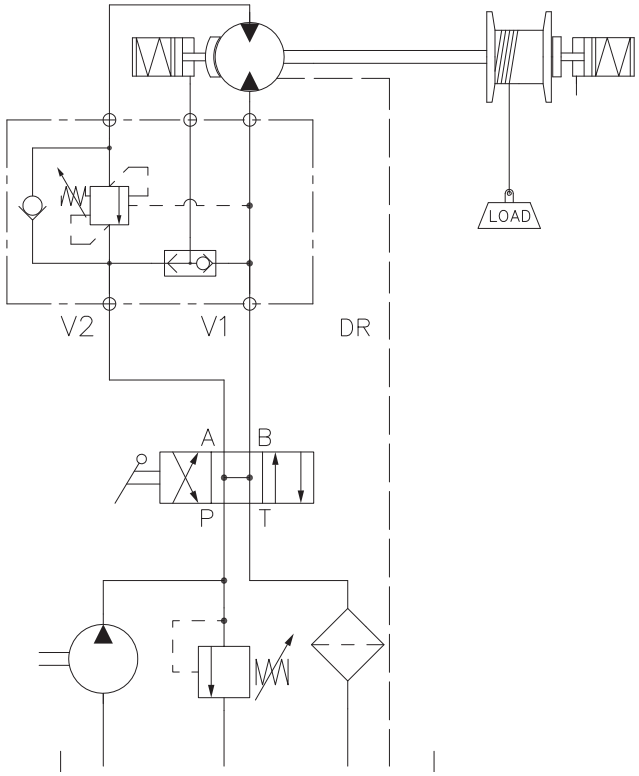
The measured backpressure on V1 and V2 (main oil ports) shall be between 1 and 5 bar.

⚠WARNING

Backpressure values lower than 1 bar could cause insufficient oil supply to the motor, values higher than 5 bar weaken dangerously the braking torque capacity.

Recommended hydraulic diagram for LoP (Lifting of Personnel)

BWE-BWP line comes also with a secondary brake on the drum (able to load only LoP loads), below possible circuit:



NOTICE

LoP circuit for opening secondary brake is not scope of supply; it's fully demanded to the installer.

⚠WARNING

LoP secondary brake cannot withstand motor pressure, a reduced pressure value shall be used.

Specific information can be found on dimensional drawing and on the catalogue.

⚠DANGER

LoP secondary brake cannot withstand cargo load. There is the risk of falling load, if the lifted load is higher than the LoP SWL indicated on the nameplate.

6.7.2 GEAR OIL

The winch is normally supplied with the correct amount of lubricant oil inside it (normally VG 150 mineral ISO 3448) as stated in the winch's specifications sheet.

In case the winch is supplied without oil, the user must carry out correct filling with pre-filtered oil before starting the machine.

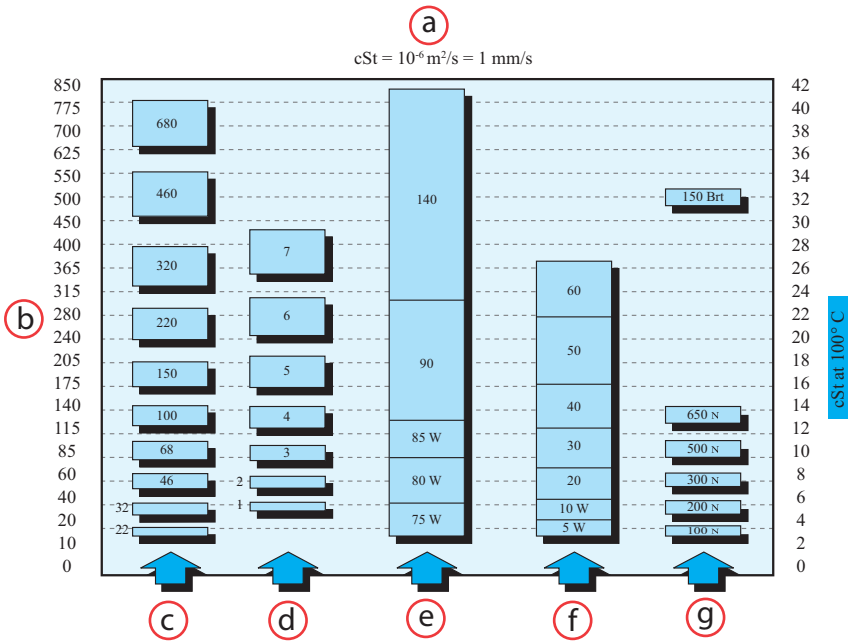
In standard application oil level is at the center line of the drum referred to the final working position (see applicable dimensional drawing).

The first oil change must be done prior to completion of 100 hours of operation: initial running in period. After this, every 500 hours of winch operation. For controlling, topping up and changing the oil, use the plugs provided for this purpose, as shown in the specifications sheet. The washer seals under the plugs should be changed every time they are unscrewed for such work. When changing the oil, you should also clean inside the reduction gear using cleaning liquid suitable for this purpose and recommended by lubricant manufacturers.

Final user should control the lubricant level every 20 days, regardless of the number of hours of operation.

NOTICE

When operating the winch at ambient temperatures above +40°C, we recommend using a lubricant with viscosity class VG 220 synthetic ISO 3448.



a - Viscosity Classification
b - cSt at 40° C
c - ISO VG
d - AGMA No.
e - SAE number transmission
f - SAE Number motors
g - SUS (basic oils)

6.7.3 HYDRAULIC OIL

Prior to any use of the winch, the motor case must be filled. If the motor is already installed into position, it is possible to fill the casing following the directions shown in figure "6.5 Hydraulic motor assembly, page 57". While doing this, it is important to avoid any contamination of the casing with dirt or other contaminants.

All installation orientations (also for intermediate orientations not shown) are to be mounted after the optimum filling orientation. The housing is to be filled from S1 or S2 drain port with pre-filtered oil with contamination 18/16/13 according to ISO4406. At this point in time, all other ports must be plugged. Ports which will be required later must be closed by means of pipe bends or non-return valves. This prevents air entering the unit when turning it into its installation orientation. When installing the unit below the minimum oil tank, it should be noted, that the ports are then only opened after the tank has been filled and when the unit is below oil level.

⚠WARNING

Check that no air is present in the brake line pipe, it could cause the brake to not perform properly.

NOTICE

Multi disks brake are not designed for dynamic braking.

6.7.4 ELECTRIC CONNECTION

NOTICE

Electrical connection on the winch shall be in accordance with EN 60204-32.

The installer should foresee protection for possible mechanical dangers on all electrical connections.

6.8 ASSEMBLY OF THE ROPE ON THE DRUM

NOTICE

The winch is generally supplied with the rope separated from its drum.

Assembly of the rope must be performed by the operator or by a qualified technician, following the instructions of the rope manufacturer, after running the winch according to trial operation "7.1 Trial operation, page 75".

⚠WARNING

Ensure that the emergency switch is working and that a skilled operator is on hand and ready to stop the winch in the event of entangling or other irregularities that could cause harm to the operator in the vicinity of the cable.

Mount the cable according to the regulations of the cable supplier. Do not mount a cable diameter other than the specified on the name plate or on the winch dimensional drawing.

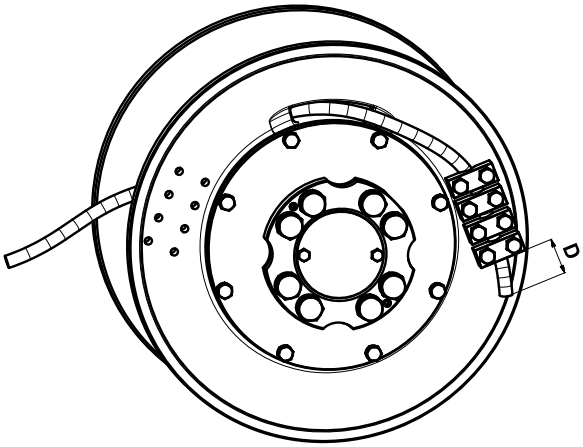
1 - Check the compactness of the cable end prior to installing it;

2 - Insert the cable end from the inside of the drum through the rope slot in the drum flange and then in the clamps;

3 - Check and position the rope clamps, that could be supplied in advance on the drum or in a side box, in the correct way according to the final application and the relating rotation sense;

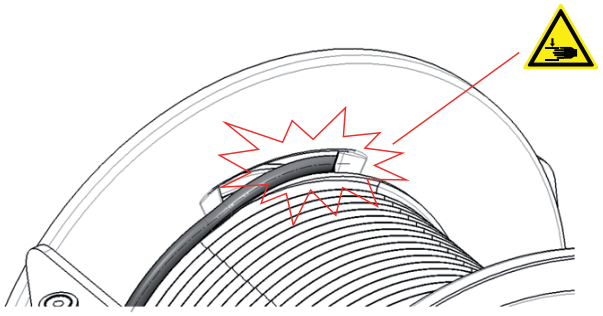
4 - Make sure the length D of the rope coming out from the last clamp is at least twice (2 times) the rope diameter;

5 - Tighten to the required torque as per table "6.4 Positioning, page 53"or as per indication on dimensional drawing.

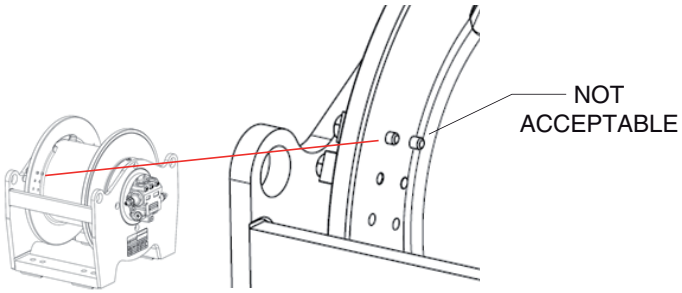


⚠WARNING

Pay attention during fixing the rope: danger of finger crushing.
Keep safety distance from the drum when it is rotating.



Make sure that the rope together with its fixings is firmly anchored and correctly pre-tensioned.
Make sure that the rope clamp screws do not pass over the drum flange. If it happens, shorten the screw to avoid rope damage.



⚠CAUTION

Maneuver the free end of the rope with suitable protections and equipment. Be careful not to wear / damage the rope by following the advice given.

⚠WARNING

All operations must be carried out with the winch stopped: proceed with caution when rotating the drum for positioning.

Always keep a minimum of three (3) rope coils winded on the drum to be compliant with Machine Directives 2006/42 CE and to ensure a safe winch holding capacity. The rope dead end fastening alone is not sufficient to hold the winch load.

⚠WARNING

If the minimum rope control is not provided by the manufacturer, it is demanded to the final installer.
The machine must have a control system for the minimum capacity of the rope.

Never fit or install a rope with diameter different than the one allowed as shown on the dimensional drawing or on the nameplate to ensure proper fitting of the rope clamps and cause possible safety issues (rope detachment from the drum).

Never fit or install a rope longer than the maximum allowed as shown on the dimensional drawing or on the nameplate to avoid excess rope to over pass drum flanges and cause possible safety issues (rope breakage).

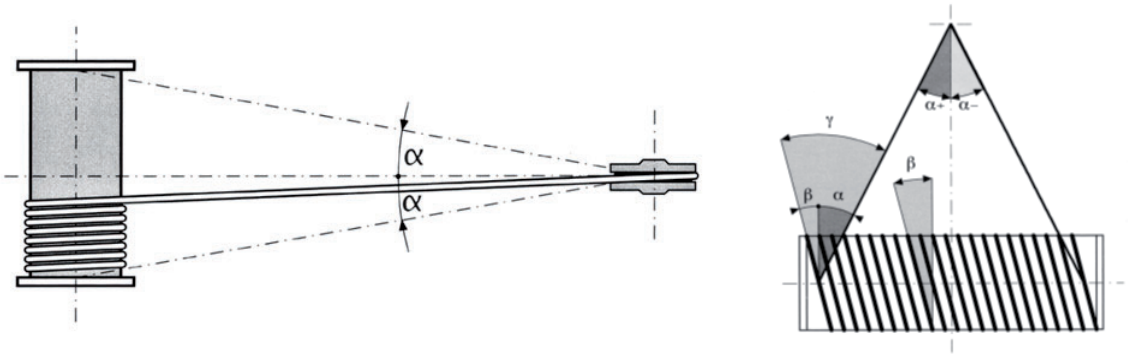
The first winding of the rope on the drum shall be made to have perfect compactness of the rope and avoid space between the windings. Keep the rope under tension during the first winding operation as prescribed in ISO 4309. The rope can be easily damaged should it be wedged under load between non compacted under laying windings.

NOTICE

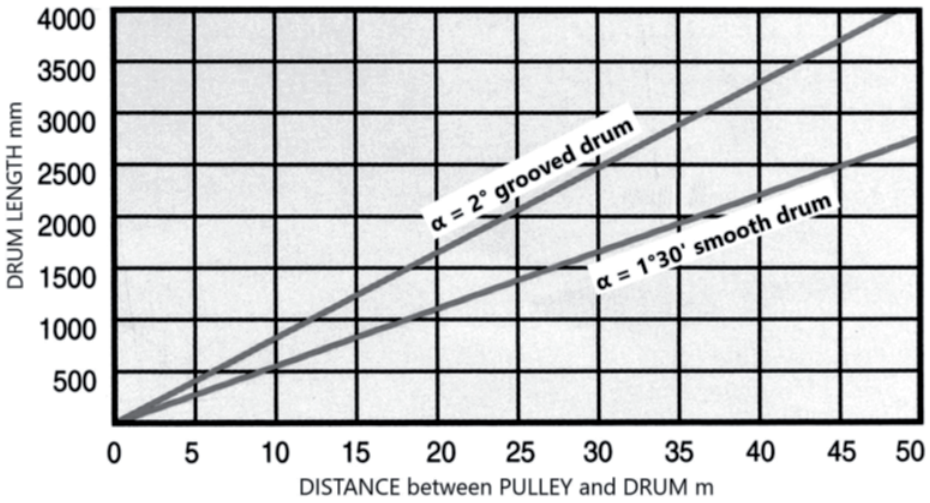
The installer should use and install proper lifting accessories able to withstand the maximum lifting capacity of the winch.

6.8.1 ANGLE OF DEVIATION

The angle of deviation is the angle formed by the axis of the rope and the surface passing through the race of the pulley. The pulley must be directed so as to minimize the entry angle as far as possible, ranging from zero when the rope is midway on the drum to maximum when it is close to one of the two flanges.



When the rope is wound onto drums without grooves or in several layers, the angle of deviation α must not exceed 1°30' in order to prevent irregular winding of the rope onto the drum. If the angle exceeds this, a rope guide should be used. When the rope is wound onto a grooved drum, the angle of deviation γ should never exceed 4°.



NOTICE

For practical reasons, the construction drawings of some cranes and hoists may not be able to comply with these instructions (recommended values). In this case, the life of the rope will be affected and must be checked more frequently.

The first rope sheave must be centered with the drum. To allow the rope to spool correctly, it is imperative that the rope comes off the drum at a sufficiently low fleet angle. In the table below, the minimal and maximal fleet angles are given for smooth and grooved drums. Higher fleet angle will result in excessive wear, grinding noise and bad spooling.

6.8.2 WIRE ROPE

Follow the wire rope manufacturer's instructions. At minimum, observe the following guidelines:

1 - Clean with a brush or steam to remove dirt, rock dust or foreign material on the surface of the wire rope;

2 - Lubricate the rope by means of high viscosity oils or light greases containing adhesive additives together with graphite, molybdenum bisulphide or sodium triphosphate;

3 - Brush, dip or spray lubricant weekly, or more frequently, depending on severity of service.

⚠WARNING

Always check wire rope integrity before winch operation. Fitting a new suitable rope is necessary if the existing one has been squeezed or has broken strands.

6.8.3 SHACKLE AND HOOK

Follow the shackle and hook manufacturer's instructions. At minimum, observe the following guidelines:

1 - Clean with a brush or steam to remove dirt, rock dust or foreign material on the surface of the rope accessories;

2 - Check the tightening torque if bolt or nuts are present in the rope accessories.

⚠WARNING

Always check shackle and hook integrity before winch operation. Fitting new suitable rope accessories is necessary if the existing one has been damaged or is rusty.

6.9 SETTING OF THE OPTIONALS

All the optional are preinstalled on the machine; this does not mean they have been already pre-set by DANA.
Check the following instruction to understand the way it is supplied and how to correctly set it on the final machine.

6.9.1 SETTING OF PRESSURE ROLLER

⚠WARNING

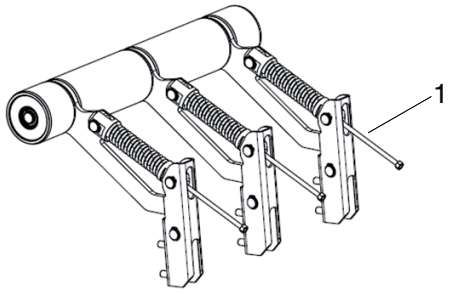
Pay attention to the pressure roller springs: danger of projecting objects and crushing.

The pressure roller is installed on the machine if requested, if not supplied it is demanded to the installer to prevent the rope to go out of the drum flanges causing dangerous situations.

NOTICE

Before any rotation of the drum, for example for the installation of the rope, make sure that the pressure roller is at a distance from the drum equal to the diameter of the rope, by adjusting it with the tie rods (1). These must be removed only after having wrapped the first layer of rope on the drum.

Warning: only the first layer, and not the second.



6.9.2 SETTING OF THE MINIMUM ROPE CAPACITY LIMIT SWITCHES: ELECTRIC AND HYDRAULIC

The minimum rope capacity limit switch is installed on the machine if requested, if not supplied it is demanded to the installer.

This device can be supplied with electric o hydraulic microswitch, and in both cases prior to delivery, the clicking mechanism is pre-set by DANA with the roller touching the drum. The installer shall double check the correct setting any time maintenance is needed or as per first installation when connecting the signal in the final application.

To set the click mechanism proceed as follow:

1 - Loosen the two nuts (1)

2 - Check that the roller (2) touches the drum

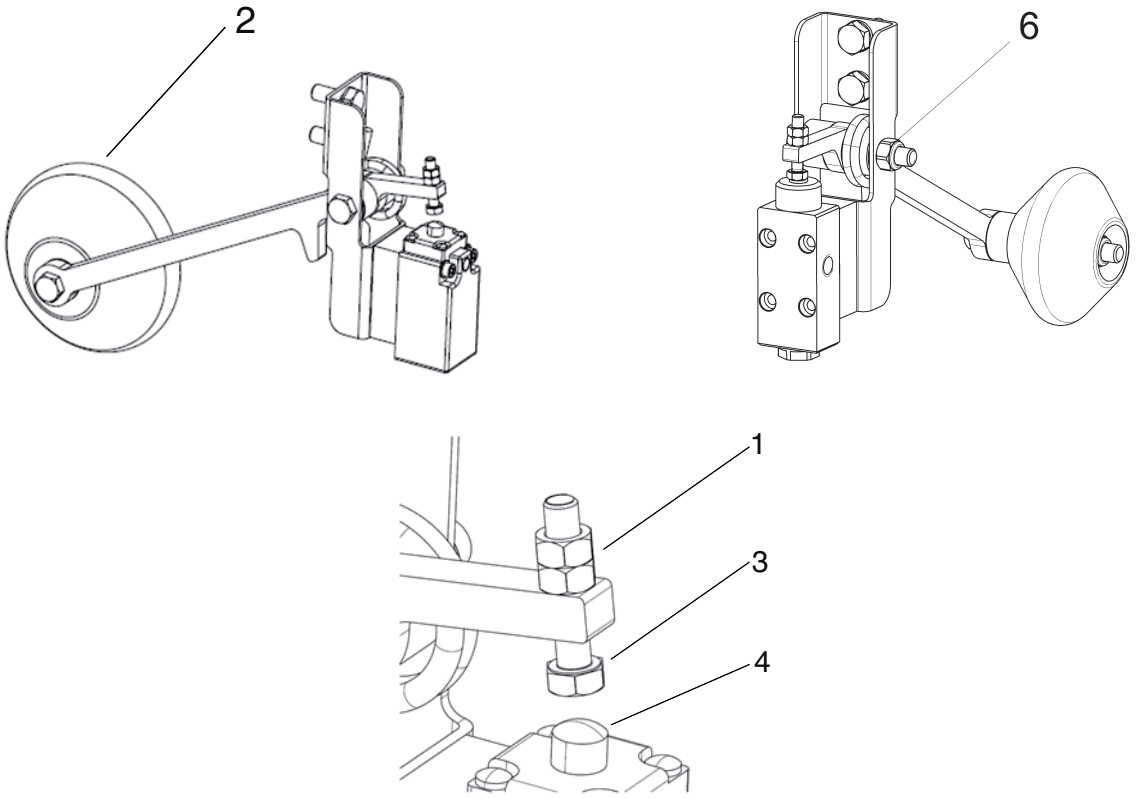
3 - Position the screw (3) making sure that the button (4) is activated and there is still a small gap before going in to interference with the microswitch itself

4 - Lift the roller several times and drop it to double check the correct positioning, it should keep clicking the button all the times

5 - Tighten the nuts (1) to the required torque to avoid later unwanted loosening

6 - Make sure the self-locking nut (6) of the lever pin is set against the support but it does not prevent the lever from freely rotating

7 - Replace roller (7) when worn.



NOTICE

To avoid full unwinding of the rope from the drum, a minimum of 3 (three) windings shall always remain wound. Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.

According to BWE-BWP size, the roller of this device can be mounted on the left or on the right of the lever. When ordered as spare parts, it will be supplied in the standard position. If the roller must be moved to ensure the minimum windings requirement to the other side of the lever, make sure to follow the steps below:

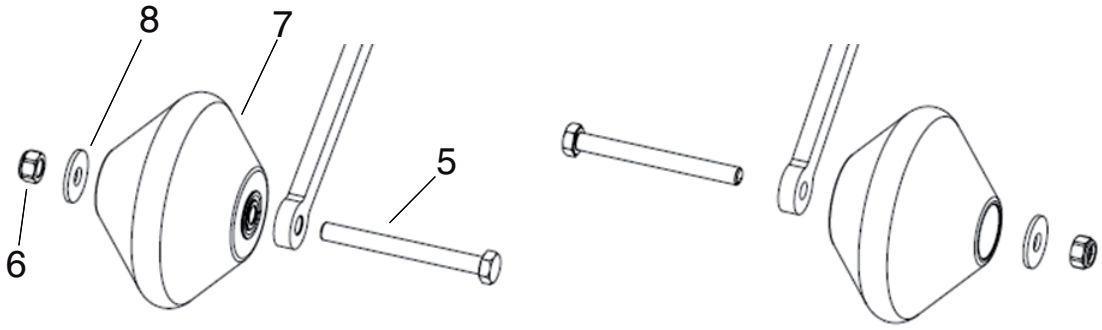
1 - Loosen the screw (5) and nut (6)

2 - Switch the position of the roller (7) and its internal component

3 - Pay attention to not lose washer (8)

4 - Re assembly all these parts on the other side of the lever

5 - Tighten screw (5) and nut (6) to the required torque



6.9.3 SETTING OF THE PHONIC WHEEL AND PROXIMITY SENSOR

The phonic wheel and proximity sensor are installed on the machine if requested; the proximity sensor is pre-set by DANA prior to delivery at the correct distance from the phonic wheel. The installer shall complete the electrical connection to the machine electric control panel and integrate the signal.

The distance of the proximity sensor from the phonic wheel shall be double checked any time maintenance is needed. A distance between 2 and 6mm is required between sensor and phonic wheel.

NOTICE

Wind and unwind completely the rope on the drum a couple of times to check the set parameters are in line with minimum and maximum rope capacity.

6.9.4 SETTING OF THE MINIMUM / MAXIMUM ROTATIVE ELECTRIC LIMIT SWITCH

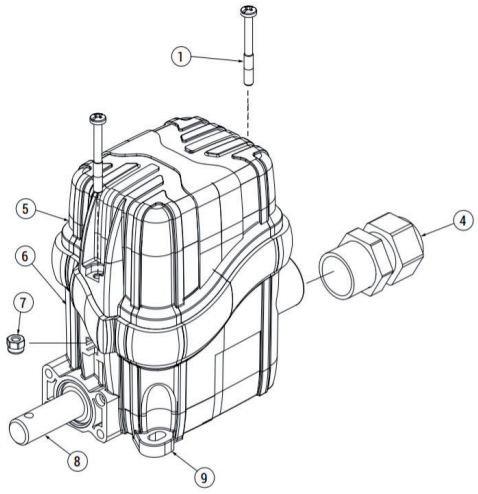
The minimum /maximum rotative electric limit switch is installed on the machine if requested, if not supplied it is demanded to the installer.

This device is supplied with electric microswitches, and the cam mechanisms are NOT pre-set by DANA prior to delivery. The installer shall set the correct settings for both cams according to the desired minimum and maximum rope capacity and double check any time maintenance is needed.

NOTICE

To avoid full unwinding of the rope from the drum, a minimum of 3 (three) windings shall always remain wound. Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.

The installation of the limit switch shall be carried out by expert and trained personnel. Wiring shall be properly done according to the current instructions. Prior to the installation and the maintenance of the limit switch, the main power of the machinery shall be turned off.



To set up the minimum/maximum totative electric limit switch refer to the dedicated manual attached to the machine.

NOTICE

Wind and unwind completely the rope on the drum a couple of times to check the set parameters are in line with minimum and maximum rope capacity.

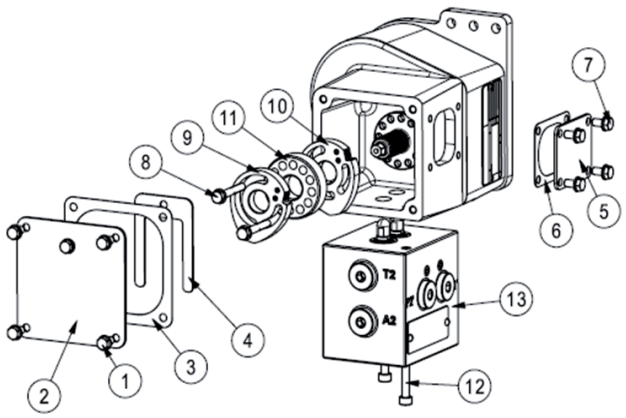
6.9.5 SETTING MIN/MAX ROTATIVE HYDRAULIC LIMIT SWITCH

The minimum /maximum rotative hydraulic limit switch is installed on the machine if requested, if not supplied it is demanded to the installer.

This device is supplied with hydraulic valves, and the cam mechanisms are NOT pre-set by DANA prior to delivery. The installer shall set the correct settings for both the cams according to his desired minimum and maximum rope capacity and double check any time maintenance is needed.

NOTICE

To avoid full unwinding of the rope from the drum, a minimum of 3 (three) windings shall always remain wound. Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.



To set up the minimum/maximum totative hydraulic limit switch refer to the dedicated manual attached to the machine.

⚠WARNING

Do not carry out the setup with a load on the hook.

Do not use the adjustment screw to press the command buttons during the setup stages.

Do not carry out the setup without having loosened the two cam fixing screws.

NOTICE

Wind and unwind completely the rope on the drum a couple of times to check the set parameters are in line with minimum and maximum rope capacity.

6.9.6 SETTING OF ENCODER (POSITION AND SPEED)

NOTICE

To avoid full unwinding of the rope from the drum, a minimum of 3 (three) windings shall always remain wound. Limit switches are mandatory for lifting applications but are only fitted if requested, if not supplied it is demanded to the installer.

The encoder is installed on the machine if requested.

The installer shall complete the electrical connection to the machine electric control panel and integrate the signal. No setting is required on the machine.

NOTICE

Wind and unwind completely the rope on the drum a couple of times to check the set parameters are inline with minimum and maximum rope capacity.

6.9.7 SETTING OF THE TORQUE SENSOR

The Torque Sensor is installed on the machine if requested. This device, prior to delivery, is pre-set by DANA.

The installer shall complete the electrical connection to the machine electric control panel and integrate the signal.

NOTICE

A load limiter is mandatory for lifting applications with loads over 1000 kg or 40000 Nm and shall be applied by the installer, the Torque Sensor is fitted only on request.

The Torque Sensor has a default zero (no load) setting in built; this setting can be reset to adjust better the "no load" condition at 4mA. Follow the procedure below to set this value:

1 - Connect in series with the Torque Sensor the Calibration Tool

2 - Make sure there is no tension on the rope

3 - Switch off and on the supply on the System

4 - In the first 10 seconds after power supply, press ZERO and MAX buttons for at least 4 seconds, until the led will start to flash

5 - Press ZERO button for 1 second on Calibration Tool, (the led will flash with higher frequency for a moment)

6 - Switch off and on the System

7 - Disconnect the Calibration Tool and reconnect the System directly to the Torque Sensor

8 - Switch on the System

9 - Torque Sensor zero setting setup is complete

The Torque Sensor has a default 100% rated load torque setting in built. Follow the procedure below to set the value to final machine need:

10 - Lift the maximum load to which set 100% of overload

11 - Read the mA provided by the TOR sensor

12 - Set that value in machine electronic as the maximum signal the winch can reach

NOTICE

The procedure above should be followed with rope on the first layer and in the middle of the drum. This ensure the best condition for the TOR sensor.

NOTICE

The maximum lifting value shall be less or equal to the Max line pull as indicated on the name plate on the relative layer.

⚠WARNING

Do not carry out the setup with a load higher than the one reported on the nameplate.

7 COMMISSIONING



NOTICE

Before starting up the machine, read this manual with care and make sure to have understood its contents.

For more information or explanations, contact the manufacturer.

Persons in charge of running and servicing the machine must possess the specific competences described in this manual as well as the psychological and physical abilities needed to use the machine.

The following paragraphs provide instructions for putting the machine into service.

NOTICE

Before putting the machine into service:

- Check all the installation operations have been carried out with positive results.
- Verify the correct positioning of the rope clamps, the correct direction of the groove and the required sense of rotation of the drum.
- Check that the motor rotation sense, the orientation of the over center valve and the connection to the power lines are corresponding to the required drum rotation and with the scheme of the distributor valve.
- Make sure that all the hydraulic connections are fitted properly and are not leaking.
- Check that all hydraulic lines are free of air, especially the brake line.
- Check the tightness of all the nuts and bolts.
- Make sure that the hydraulic circuit has the features described in the relative paragraph. In particular the operating pressure is sufficient to fully open the brake and the maximum system pressure does not exceed the maximum allowed pressure on the brake and winch.

⚠WARNING

Before continuing, assure yourself of the following:

- The actual hydraulic and electric parameters such as pressure, flow, frequency, voltage and current of the power supply system are sufficient for the application and do not exceed the values indicated on the winch nameplate or specification.
- All safety devices, in particular the brake(s), over center valve, limit switches have been installed properly and are properly connected to the power supply.

7.1 TRIAL OPERATION



NOTICE

All information relating to pressure, oil flow rate, lifting capacity and speed are given in the winches' technical specifications tables.

Before winding the rope around the installed winch, run the latter in both directions for a few minutes.

Perform a trial lifting cycle with a light load. Check correct operation of the brake by stopping the load during its upward movement. Make sure that the load is lowered in a smooth, controllable and jerk-free manner.

Suggested testing cycles are below described.

7.1.1 NO LOAD TESTING

1 - Run the winch without load, if possible, at low speed. Pay attention for excessive noises from the prime mover, brake, gearbox and accessories.

2 - If no excessive noises are heard, gradually increase speed to maximum.

3 - When the winch is stopped, the brake should apply immediately and stop the rotation of the drum.

4 - Repeat the above for the opposite sense of rotation.

5 - Run the winch in both directions for a few minutes and check for excessive noises and/or heating of the components.

6 - After this, check all oil levels and correct if necessary.

⚠WARNING

Before continuing, assure yourself that the actual load of the winch does not exceed the value indicated on the nameplate and in the winch technical specification. If a certain overload is required for testing or certifying purposes, always consult Dana Motion Systems Italia srl prior to exceeding the nameplate stated values.

⚠WARNING

Comply with minimum oil flow admissible. Information are provided in the winches' technical specifications tables and on the catalogue. Lower oil flow can severely damage the winch.

NOTICE

If the winch still has the rope wound on (testing on a bench and/or not on the final machine), pay attention to the rope end and/or secure it in order to not damage nearby structure or components.

7.1.2 LOAD TESTING

1 - Run the winch at low speed (if possible) and lift the load to a minimum height. Listen for excessive noises from the various components.

2 - Stop the winch and check the brake. The load should come to an immediate stop and after this there must be no sign of any slipping of the load whatsoever. If this is the case, refer to "8.7 Troubleshooting, page 83".

3 - Lower the load and stop again, making sure that the brake works properly.

4 - If this works well, lift the load higher and run up and down at low speed for several minutes, making sure that the brake is applied in both directions.

5 - Listen for excessive noises from the various components and check all components for excessive heating.

6 - Repeat the above sequence at high speed and check for noises, heating and brake action.

7 - During and after testing under load, check if all bolted connections are still tightened properly.

If all is satisfactory, the winch is now ready for normal operation.

7.2 USE

The end user in charge of the machine where the winch will be installed shall be adequately trained and shall understand the information contained in the present manual.

The machine is used to lift loads and/or people.

Lifting of loads and people must take place by means of appropriate load pick-up devices which are generally not supplied with the winch (hook).

For the lifting of people, the installer will have to provide a containment system for the same (platform): the load (platform + people) must not exceed the capacity of the LoP (Lifting of Personnel) winch which is engraved on the plate.

NOTICE

The end user shall respect all the information concerning the appropriate use in this manual.

⚠ CAUTION

The rope shall always be taut to avoid incorrect winding or exit from the drum.

Before using the winch, check that the environmental conditions do not generate sources of danger for the safety of the machine and of the operators (eg rain, wind, etc.).

⚠ WARNING

The end user shall limit the rope speed during the initial lifting phase and during the final unloading phase.

Before using the winch, make sure that the rope is in perfect working order. If it is crushed or frayed, replace it immediately.

Avoid excessive use of impulses to prevent damage to the winch / machine.

Leave at least three (3) windings of rope around the drum.

⚠ DANGER

Lateral sideways loading movement is forbidden because it can cause danger for the people and/or structures near the machine and the load (inability to control the load for instant release).

Pulling and loading laterally is forbidden.

Lifting blocked or obstructed loads is forbidden (damage to the machine and sudden release of the load with inability to control it).

Never use the winch beyond its maximum pulling capacity.

Unexpected breakage of the taut rope or any failure that causes the hook to release the load will result in a particularly dangerous whiplash action.

For this reason, never stand in the operating radius of the rope.

Never guide the rope with your hands while the winch is running.

Do not smoke and use naked flames: danger of fire near the winch.

During operation, protect the moving parts from accidental contact by using fixed, movable guards or indicating the danger zones with pictograms so as to inform the user about the residual risks.

Do not smoke and/or use open flames: danger of fire.

8 MAINTENANCE

8.1 MAINTENANCE PERSONNEL

Operators in charge of maintenance must attend classroom and practical training as described in detail below:

- classroom and function training concerning all machine equipment;
- classroom and function training conducted by the manufacturer and concerning the equipment on which the winch is installed and to which it is connected.

8.2 SAFETY CONDITIONS DURING MAINTENANCE

When servicing, the maintenance mechanic must be wearing suitable personal protective equipment, namely:

- accident-prevention footwear
- protective gloves
- approved accident-prevention garments

1 - Maintenance of the machine must be carried out by qualified and explicitly authorized personnel only. All maintenance operations must be performed under the supervision of a foreman.

2 - Before carrying out repairs or any other work on the machine, always warn the other operators involved of your intentions.

3 - All interventions must be made with the machine halted and isolated from the supplies.

4 - When performing maintenance work in poorly lit areas, use a portable lighting system and avoid areas of shadow that prevent or reduce visibility in the areas where the intervention is performed or in the surrounding areas.

5 - Never wear rings, wrist watches, jewelry, loose-fitting or hanging clothing such as ties, torn garments, scarves, unbuttoned jackets or unzipped overalls, that could get caught up in moving parts.

6 - Avoid working in damp environments. The area where the maintenance operations are executed must always be kept clean and dry.

7 - Never carry out any of the following operations on the frame: drilling, cutting, etc. (unless you have received an authorization from the Manufacturer).

8 - For replacements, use only ORIGINAL SPARE PARTS.

9 - Always keep the machine and surrounding area clean.

⚠WARNING

Before to start any maintenance operation:

a - make sure the machine is unloaded;

b - disconnect the winch from energy sources (electric, hydraulic);

c - wear PPE

d - make sure that the hydraulic circuit is not under pressure and that the fluid temperature does not exceed 30°C

Before starting the machine, make sure that:

a - any guards removed during maintenance operations have been correctly fitted and are in working order;

b - all spare parts are correctly assembled and secured in place;

c - all foreign objects (cloths, tools, etc.) have been removed from the machine.

Do not work on the machine with tools, cleaning equipment, etc. when it is running.

8.3 GENERAL MAINTENANCE

The winch is supplied with the amount of lubricant oil inside it (typically VG 150 mineral ISO3448) as stated in the winches' specification sheet. The first oil change must be done prior to completion of 100 hours of operation: initial running in period. After this, every 500 hours of winch operation the oil must be changed completely.

The Operator is in charge of routine maintenance, including the following tasks:

- Changing the reduction gear oil as instructed after no more than 100 hours of operation (running in) or after the first two years after installation. Regardless of the type of work the winch is used for, check the status and the level of lubricant on a regular basis and top up when necessary.
- Changing the hydraulic circuit oil as instructed in the installation and maintenance manual of the final machine. It is suggested to do a first hydraulic oil change after approximately 500 hours of operation, filtering element must be replaced first time after 50 hours for preliminary circuit cleaning and then every 500 hours; subsequently change hydraulic oil every 2000 hours. Such intervals should be reduced when the filter clogging indicator shows that the cartridge is clogged or when the system works in a heavily polluted environment.
- Dana Motion Systems Italia srl does not allow the opening of the hydraulic motor or nay work on the negative brake (residual risk). Dana Motion Systems Italia srl does not allow the opening of the reduction gear for any reason except for routine maintenance.
- After 1000 hours of winch operation a full service of the negative brake is mandatory. This work must be done by Dana Motion Systems Italia srl or by an authorized service center.
- After each emergency brake stop, the brake shall be checked.

8.3.1 MAINTANCE SCHEDULE

Below a guideline of suggested intervals and related operations that could be used. Personal or corporate experience of the inspection and maintenance personnel should always take precedence above these recommendations because their frequency depends upon the severity of usage of the application and should be accordingly restructured.

Operation	Frequency				
	8 hours	250 hours	500 hours	1000 hours	Chapter in manual
Cable inspection	x				
Oil level check and top up		x			
Cable lubrication		x			
Screw, hydraulic and electric connection tightness check		x			
Lubricate and re-grease all moving parts		x			
Winch gear oil change			x*		
Hydraulic circuit oil filter change		x			
Hydraulic circuit oil change			x		
Change brake components				x	
* First change after 100 working hours, and then after 500 hours or after 2 years, whichever comes first.					

8.4 CLEANING

NOTICE

Perform cleaning with the machine isolated from all energy supplies.

Never clean the machine and its components with solvents, corrosive liquid or abrasive objects.

If you are using the winch in corrosive environments, containing rough polluting particles and/or very fine dust, wash the winch with water and suitable fluids to prevent dirt depositing and damaging important components such as nuts and bolts, rings and washers.

Plan maintenance correctly so as to prevent excessive wear and tear of the winch (see "8.3.1 Maintance schedule, page 79")

8.5 ROUTINE MAINTENANCE

8.5.1 SAFETY MEASURES

The norm provides for assessing and informing of possible damage to be described in the event of a sequence of incorrect operations.

- crushing of the limbs in the case where the machine is not disconnected from the power supply;
- projection of objects (springs);
- projection of objects and crushing of the negative brake springs;
- fluid ejection;
- puncture in the event of damage to the rope wires;
- dragging of the rope;
- crushing of the upper and lower limbs in case of disassembly subassemblies without having secured them to an anchorage point;
- burns, skin or eye damage when disassembling hydraulic parts without waiting for the part and/or the oil to cool.

8.5.2 RENEWING LUBRICANTS / TOPPING UP

⚠ CAUTION

Remove any oil inside the reduction gear and store in appropriate containers ready to be handed over to authorised waste disposal centres, in accordance to the laws in force.

Lubricant must be changed the first time within and not later than 100 working hours from running in. In normal environmental conditions, lubricant can be renewed every 500 hours of work. For recommended lubricants see "6.7.2 Gear oil, page 63"or the winch catalogue.

Replace seals under the plugs every time you unscrew them for inspections.

It is recommended to replace the lubricant when it is warm to prevent sludge forming. When renewing oil, it is recommended to wash the reduction gear with a suitable fluid, as indicated by the lubricant manufacturer.

Irrespective of the type of work, regularly check the winch, the condition and level of lubricant and if necessary, top up.

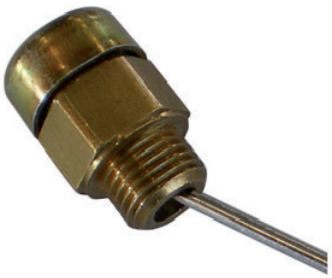
8.5.3 VENT PLUGS

BWE-BWP series is not provided with vent plugs, as a standard. In severe application, where ambient temperature is more than 60% of the time above +35°C, or when the stopping time does not allow the oil to cool down, the installation of a vent plug is suggested.

Vent plug shall be installed in the higher position possible in relation to the winch installation on the final machine, see "6.4 Positioning, page 53".

In case, the application needs a breather plug, follow the following instruction.

Every time lubricant is renewed or topped up, push the inner section of the plug with a pin until you overcome the resistance of the compression spring on the closing diaphragm (max. 0.1-0.2 kg); to make sure that there are no obstructions, blow compressed air (max. 0.5 bar) from the inner to the outer side of the plug.



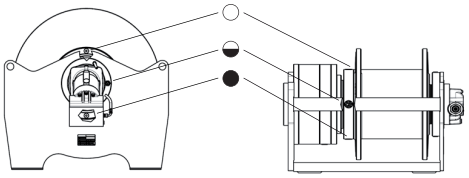
⚠ CAUTION

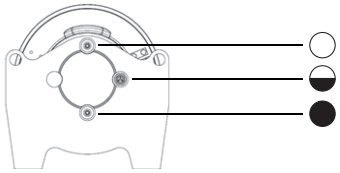
It is recommended to perform this operation regularly irrespective of whether oil is renewed or not to prevent vent clogging.

8.5.4 OIL FILLING

For oil filling follow the instructions below:

- Remove plug ○ and filling/level plugs ◒ .
- The winch may contain a small amount of protective oil. Remove it by opening the drain plug ●
- Then close the drain plug ●.
- Fill the winch with oil by a pump through one of the two plugs ◒ . Fill the winch until the oil comes out from the opposite plug ◒ . Oil quantity can be found on dimensional drawing and/or on the catalogue.
- Remove the pump and close all the plugs.





According to winch final assembly position, plugs position change accordingly. Available position are represented above and depends on the size of the winch.

8.5.5 RECOMMENDED LUBRICANTS

The oil of the first delivery is VG 150 Mineral ISO 3448, unless differently requested. When the oil is changed, a similar and compatible oil must be used.

8.5.6 RECOMMENDED ROPE MAINTENANCE

The rope maintenance must be performed according to the ISO 4309.

8.5.7 RECOMMENDED SAFETY SYSTEM MAINTENANCE

Installer must provide a control frequency depending on the application and frequency of use.

8.6 EXTRA DUTY MAINTENANCE

Extra-duty maintenance is generally performed by qualified technicians of the manufacturer or authorized by the same.

⚠WARNING

Dana Motion Systems Italia srl prohibits users to open the hydraulic motor or work on the negative brake system.

Dana Motion Systems Italia srl prohibits users to open the reduction gear for any operation except recommended routine maintenance.

After 1000 hours of work of the winch, the negative brake system must be overhauled.

This operation must be performed by the **Dana Motion Systems Italia srl** Technical Service Centre or by an authorized service center.

8.7 TROUBLESHOOTING

⚠ CAUTION

If the winch is not working properly, check the troubleshooting table to locate the cause and the solution, if any.
If the problem cannot be solved, contact Dana Motion Systems Italia srl.

Hydraulic winch

Problem	Cause	Solution
The hydraulic circuit is noisy	There is air in the circuit	Exhaust air
Noise is noted during lifting without a load and winch does not turn smoothly	Insufficient oil flow rate in the circuit	Perform trial runs with increasing loads until the winch turns smoothly and the noise is no longer heard. If this occurs, increase the oil flow rate in the hydraulic circuit. If the problem remains, contact Dana Motion Systems Italia srl.
The descending load tends to be dropped	Impure particles in the valve	Empty the valve and clean it with suitable products. Check and if necessary, replace the filter cartridge in the circuit.
	The valve for control of load descent is not installed correctly	Fit the valve in its correct position, as illustrated in the hydraulic circuit diagram.
	Residual pressure in brake pilot line due to incorrect hydraulic circuit	Make sure that no residual pressure can reach the hydraulic brake unwanted, refer to "6.4 Positioning, page 53".
	Worn or damaged brake disks	Multi disks brakes: replace complete brake assembly or contact Dana Motion Systems Italia srl.
I cannot lift the load	Overload	Check the load and compare with information on the name plate or on the technical documentation
	Negative brake does not open	Check for pressure in brake pilot line during operation, the brake engaging valve and the brake's components.
	Insufficient pressure in the hydraulic circuit	Compare hydraulic power circuit with information on the name plate or on technical documentation. Check that the pressure relief valve of the winch circuit has been correctly calibrated
	Motor is damaged	Replace the motor using original spare parts
The drum rotates not accordingly to the desired sense.	Incorrect assembly of the hydraulic connections	Reverse hydraulic connections
Excessive noise from the winch	Oil Level too low	Check oil level, refer to "6.7.2 Gear oil, page 63" and "8.5.4 Oil Filling, page 81"
	Internal malfunction	Contact the Dana Motion Systems Italia srl.

Problem	Cause	Solution
Lubricant leakage is noted	The rotating seals are damaged	Replace the rotating seals (winch and motor)
	The oil plugs have come loose	Tighten the plugs.
	The oil level is too high	Refer to "6.7.1 Hydraulic connection, page 58".
	Hydraulic oil entered the gearbox due to damaged motor seals	Gearbox: check for mixture of gear oil with hydraulic oil inside the gearbox and/ or check motor seals
	Ageing of seals due to prolonged storing or damaged or worn seals	Contact Dana Motion Systems Italia srl
The nominal speed is not reached	Insufficient oil flow	Measure the oil flow rate at the V1 and V2 motor port with and if necessary, adjust as needed.
	Broken winch motor	Repair or change the winch motor (see the spare part list attached below)
When winch is operated, the load drops a few centimeters, before the winch picks it up	Incorrect positioning of the over center valve	Refer to "6.7.1 Hydraulic connection, page 58"and technical documentation.
	Incorrect setting of the over center valve	Contact Dana Motion Systems Italia srl.
After hoisting or lowering, the brake seems to slip before coming to a complete stop	Incorrect positioning of the over center valve	Refer to "6.7.1 Hydraulic connection, page 58".and technical documentation.

⚠WARNING

Slipping of the multi disc brake is an indication of worn disks. Multi disks brake are not designed for dynamic braking. Worn brake disks are an indication of dynamic braking and that is a result of a malfunctioning in the over center valve or in the hydraulic system.

9 DECOMMISSIONING

9.1 DISMANTLING AND SCRAPPING

Winch demolition must be entrusted to qualified staff.

The winch must be transported to a suitable place for disassembly.

Before performing your work, drain any fluids from the reduction gear and hydraulic motor; store them separated and in suitable containers.

Disassemble all parts, paying particular attention to the negative brake.

Destroy the name plate as soon as the decommissioning procedure is started.

Sort out and store the different types of material so that they may handed over to waste disposal centers.

⚠ CAUTION

To safeguard the environment

Remove any oil inside the reduction gears and store in appropriate containers ready to be handed over to authorised waste disposal centres, in accordance to the laws in force.

Reuse any components that can be recycled.

⚠ CAUTION

To safeguard the environment

After dividing the machine components up according to the material, they must be disposed of by authorised waste disposal centres in accordance to the legislation applicable in the country where the machine is used.

Do not dispose of wastes in the environment.

10 RESIDUAL RISKS

Demanded to the final installer the evaluations of risks related to the interference between the two machines.

Demanded to the final installer the incorporation of the overload signal if the machine is supplied with the overload sensor, otherwise the overload and its signal shall be installed by the final installer.

Demanded to the final installer the installation of carter or protection of moving parts.

Demanded to the final installer the installation of control devices with maintained action.

Demanded to the final installer the installation of control devices that ensure no risky acceleration or deceleration.

Demanded to the final installer the incorporation of the minimum rope capacity signal if the machine is supplied with one of the minimum rope control devices, otherwise the minimum rope control device and its signal shall be installed by the final installer.

Risk	Description of dangerous situation	Solutions adopted
Exceeding the maximum load, breakage and overturning.	Usually the machine is not equipped with a maximum load limit because said limit very much depends on the type of application used. When installing the maximum load device, the installer must take account of the conditions in which the winch is expected to be used. In addition, a safety system must be set in place in order to ensure the vehicle the winch is installed on cannot be overturned, in other words the overloading of the machine. All the tests requested (maximum load, overturning) must also be carried out.	Information in the manual
Loss of stability	The machine must be properly fixed by the installer	Information in the manual
Danger of crushing during transport operations	During transport, lifting and handling, the machine may fall. In addition, check that the packaging is in good condition and provided with strap	Instruction manual; training to be provided to operators in charge of transport, lifting and handling. The operations must be carried out at low speed, ensuring loads are balanced. Also check that the strap is present.
Wrong choice of rope. Rope blocked incorrectly	The rope must be chosen in accordance with the loads and class of winch, and must be fixed correctly, otherwise the load will be lost	Information in the manual
Risk due to moving parts. Guards not installed or installed incorrectly	The operator may come into contact with moving parts	Information in the manual regarding the compulsory installation of protective casing by the installer (where necessary)
Moving parts of the drive	Incorrect assembly of moving parts, causing the risk of breakage or malfunctioning of the machine	Information in the maintenance instruction manual. Internal assembly diagrams
Wrong choice of hydraulic oil	Use of non-compliant hydraulic oil. Danger of ejection of fluids, overheating	Information in the manual. Table of oils
Incorrect assembly/fitting of the hydraulic circuit	Incorrect assembly or fitting of the hydraulic circuit may damage the hydraulic motor and therefore the winch	Instruction manual; hydraulic system provided for and warnings

Risk	Description of dangerous situation	Solutions adopted
Extreme temperature	Use of the winch at temperatures other than those it was designed for, with the risk of breakage of the mechanical parts and ejection of fluids	Instruction manual: limits within which the winch is designed for use
Emission of dangerous materials and substances	During maintenance, topping up, etc. of the lubricating oil, operators may come into contact with the dangerous substance	Instruction manual: use of gloves provided for
Failure to comply with maintenance and cleaning procedures	Failure to switch off the machine before carrying out any operations on it; disassembly of the springs of the negative break -> projection of objects	Instruction manual: the installer must ensure that the procedures are carried out, making the necessary additions to the instruction manual of the final machine. The negative brake must not be disassembled

⚠DANGER

Risk of breakage due to lifting of constrained loads or damaging.

Lifting constrained objects on the ground can cause to leave suddenly the load or to reach high stresses with breaking hazard of winch and damage to things or people. It is forbidden to lift or hook blocked or constrained loads.

11 SPARE PARTS

11.1 HOW TO ORDER SPARE PARTS

The Customer must purchase only original spare parts. Removal and refitting must be performed in accordance to the manufacturer's instructions.

ORDERING SPARE PARTS

When ordering spare parts from **Dana Motion Systems Italia srl**, always indicate:

- Type of machine
- Machine serial number
- Code
- Position
- Description
- Quantity

Enquiries and orders relating to spare parts must be sent by fax or e-mail to the Aftermarket Department of **Dana Motion Systems Italia srl**, as explained in paragraph "5.5 Unpacking, page 46" of this manual.

For product inquiries or support,
visit www.dana.com.
For other service publications, visit
www.danaaftermarket.com/literature-library
For online service parts ordering,
visit www.danaaftermarket.com

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