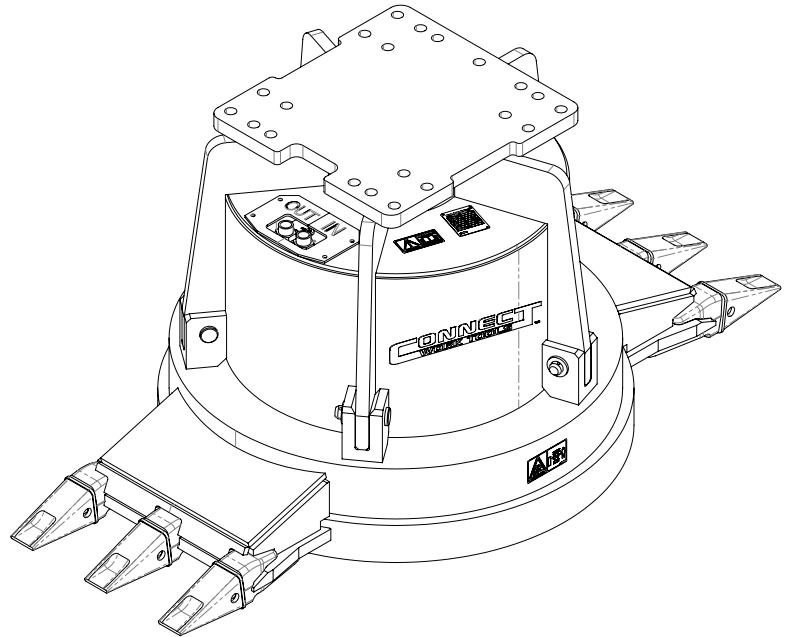
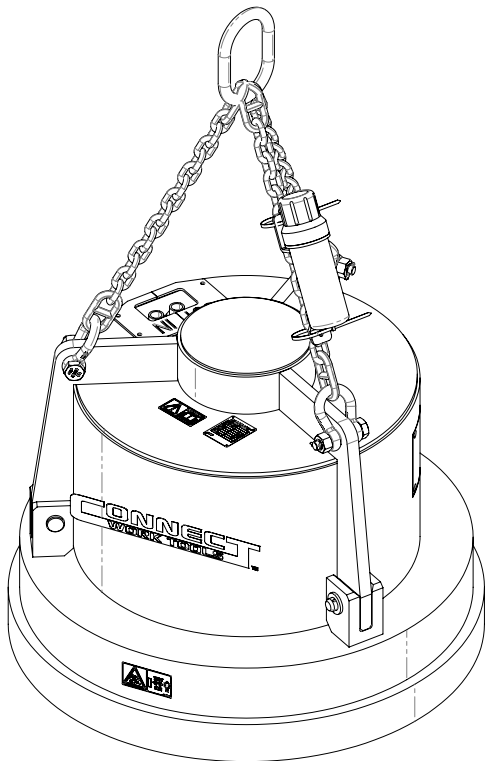




CMG Series Magnets



Models
CMG38ID
CMG42IC
CMG42ID
CMG50IC
CMG50ID

Parts & Operator's Manual CMG-Series

Parts, Safety, Operation & Maintenance

Part #CME00012

Connect Work Tools - www.connectworktools.com - 920.238.6657

CONTACT INFORMATION



Connect Work Tools
155 Main Street
Superior, WI 54880

E-mail: info@connectworktools.com
Main Phone: 920-238-6657
Fax: 715-395-3703

Contact your Connect Work Tools Representative or the Connect Work Tools Parts Department for replacement manuals. Inquiries regarding the content of this manual must include the release date shown below.

Information in this manual is subject to change without advance notice.

Table 1.1 About this manual

Document ID No.	CME00012
Type	Parts, Safety, Operation and Maintenance
Release Date	April 2025
Product Name	Hydraulic Magnet
Series	CMG
Applicable Models	CMG38ID CMG42IC CMG42ID CMG50IC CMG50ID
Years of Manufacture	2025 & above

TABLE OF CONTENTS

1. INTRODUCTION	6
1.1. Manufacturer	6
1.2. Type and area of use	6
1.3. General warnings	6
1.4. Knowledge and retention of the manual	6
1.5. Liability and warranty	7
1.6. Intended and prohibited uses	7
1.7. Preventive measures by the user	8
1.8. Use conditions	9
1.8.1 General	9
1.8.2 Disposal and demolition	9
1.9. First operations	10
1.10. Maintenance regulations	10
1.11. Handling and transportation	10
1.12. Warehousing	10
2. TECHNICAL SPECIFICATIONS OF THE HYDRAULIC MAGNETS	11
2.1. Description	11
2.1.1 Electromagnet model	11
2.1.2 Technical data	12
2.1.3 Bolt Patterns - CMG38/CMG42	13
2.1.4 Bolt Patterns - CMG50	14
2.1.5 System composition	15
2.1.6 S/N plate – identification data	16
2.1.7 Signs and stickers	16
2.2. Installation and setting	17
2.2.1 First operations	17
2.2.2 Installation constraints – mechanical connection	18
2.2.3 Installation constraints – hydraulic connection	19
2.2.4 Installation – functional checks	20
2.3. Operation	21
2.3.1 Operating logic	22
2.3.2 Enabling for use	22
2.3.3 Work cycle	23
2.3.4 Deactivation of the electromagnet	23
2.4. Characteristics of the material to be handled	24
2.5. Non-permitted loads	24

TABLE OF CONTENTS - continued

3. SAFETY	25
3.1. Residual risks	25
3.2. Noise emissions	25
3.3. Lighting	26
3.4. Safety devices	26
4. MAINTENANCE / COMPONENT REPLACEMENT	27
4.1. General indications	27
4.2. Routine maintenance	27
4.3. Periodic maintenance	28
5. TROUBLESHOOTING	29
5.1. General malfunctions	29
5.2. Troubleshooting procedure	30
5.3. Main components layout from CMG38 to CMG50	31
5.3.1 Hydraulic motor replacement from CMG38 to CMG50	32
5.3.2 Replacing the elastic coupling	33
5.3.3 Hydraulic block cleaning / replacement	33
5.3.4 Electrical generator replacement	35
5.3.5 Electronic control replacement	36
5.4. Spare parts	37
5.5. Maintenance data sheet	38
5.6. CMG38ID - DIRECT MOUNT MAGNET ASSEMBLY	39
5.6.1. CMHMG-T-95 - SUBASSEMBLY	40
5.7. CMG42IC - CHAIN MOUNT MAGNET ASSEMBLY	42
5.7.1 CMHMG-C-105 - SUBASSEMBLY	44
5.8. CMG42ID - DIRECT MOUNT MAGNET ASSEMBLY.....	46
5.8.1. CMHMG-T-105 SUBASSEMBLY	48
5.9. CMG50IC - CHAIN MOUNT MAGNET ASSEMBLY	50
5.9.1. CMHMG-C-125 SUBASSEMBLY	52
5.10. CMG50ID - DIRECT MOUNT MAGNET ASSEMBLY	54
5.10.1. CMHMG-T-125 SUBASSEMBLY	56

1. INTRODUCTION

1.1 - Manufacturer

Connect Work Tools
155 Main Street
Superior, WI 54880

E-mail: info@connectworktools.com
Main Phone: 920-238-6657
Fax: 715-395-3703

1.2 - Type and area of use

The hydraulic electromagnet has been designed for the handling of ferro-magnetic materials, particularly suitable for installation and use on self-propelled loaders and earthmoving machines.

By using the loader's hydraulic circuit, the electromagnet is activated and deactivated to allow the load to be gripped and released.

The technical data of the electromagnet and the characteristics of the material to be handled must correspond to those defined at the time of ordering. In this regard, see also Table 2.1.2

1.3 - General warnings

This manual contains all the information necessary for the installation, use and maintenance of the hydraulic electromagnets. Please follow all the instructions contained therein to obtain the best results and correct operation of the system. Before using the electromagnet and before any intervention on it, it is advisable to carefully read the instructions for use and warnings, in order to allow rational and safe use of the system and appropriate interventions. In fact, the information contained also concerns the procedures, actions and improper uses that could represent risk factors for the personnel involved. Due to the continuous improvement program of Connect Work Tools, the materials and specifications are subject to change without prior notice.

1.4 - Knowledge and retention of the manual

Before using the electromagnet, the site manager and the operator must read the instruction manual. The information contained therein is addressed to all operators assigned to operation and/or maintenance of the machine. The site manager must inform all operators of the instructions contained in the manual. In particular, before operating the machine it is essential that the operator is familiar with the positions and operation of all the controls. Furthermore, they must be able to perform all the operations described in this manual, making sure that they have fully understood the safety rules and know how to apply them correctly during use and/or maintenance. The operator must be aware of the rules concerning the prevention of accidents. The site manager must verify application of the instructions contained in the manual.

The instruction manual must be kept, for its consultation, for the entire life of the machine even when it is transferred to another user. The instruction manual must be kept in a safe and dry place. The instruction manual is not a professional training manual, i.e. knowledge thereof does not replace the level of professionalism required for the operator.

1. INTRODUCTION - continued

1.5 - Liability and warranty

The machine must ONLY be used by authorized and competent operators.

The machine must ONLY be used for the purpose for which it was designed.

The warranty on the Connect Work Tools lifting equipment extends for a period that varies according to the type of system, and is reported in the offer or in the sales contract under the item "warranty times". The warranty involves free repair/replacement ex-works Connect Work Tools, and as soon as possible, of all the materials that have construction defects or anomalies objectively demonstrable and recognised by the manufacturer. In the event that intervention is required on site, only labor costs including any travel, board and lodging expenses will be charged.

Connect Work Tools is exempted from any liability if the machine is used for any other purpose not provided for and in general the warranty automatically lapses in the cases indicated below:

- Tampering and/or changes made without its written consent.
- The use of non-original spare parts.
- Insufficient maintenance.
- Total or partial non-compliance with the user instructions.
- The improper use of lifting equipment.
- Incorrect storage and/or installation.

1.6 - Intended and prohibited uses

The intended use of the electromagnet is the handling of ferro-magnetic materials such as scrap, plates, balls, etc. For any use other than that intended, Connect Work Tools is not liable for any defects or risks arising from the use of the machine.

Therefore, use of the system for unauthorised manoeuvres, its improper use and lack of maintenance can lead to serious situations of danger to personnel, damage to the work environment and can also affect the functionality and intrinsic safety of the machine.

The actions described below, which obviously cannot cover the entire range of potential possibilities of "MISUSE" of the system and are, however, those "reasonably" more predictable, are to be considered absolutely prohibited and therefore the following are forbidden:

- Transiting, remaining, operating and manoeuvring below the suspended load.
- Bringing the body and limbs closer to the electromagnet, suspension ears or chains or hook in the "tensioning" and/or release phase.
- Allowing the system to be used by unqualified personnel or by persons under 16 years of age.
- Use of the system when not in a suitable psycho-physical condition.
- Use of the system when not equipped with suitable work clothing or personal protection measures.
- Operating without due care when lifting and moving the load.
- Leaving the suspended load unattended.
- Handling loads above the nominal capacity.
- Handling unbalanced loads.
- Swinging of the load during travel.
- Use of the system for pulling or dragging operations.
- Use of the chains as earthing for welding machines.
- Use of the system to keep elements constrained on the ground tensioned.
- Lifting of "guided" loads.

1. INTRODUCTION - continued

- Lifting of constrained loads.
- Cooling of the magnet with water.
- Immersing of the magnet in water, except in the cases explicitly provided for.
- Impacting with the load against the structures of the warehouse or other machines and systems.
- Using two pieces of lifting equipment at the same time to lift the same load without having put in place adequate safety procedures.
- Using the system in non-envisaged environmental conditions (see paragraph).
- Reaching of the "travel end" areas at full speed during the translation movement.
- Installing the electromagnet on a charger with a non-constant and stable oil flow.
- Continuing the movement of the suspended load in the presence of alarms or system anomalies.
- Performing abrupt reversals during lifting and translation operations.
- Performing temporary repairs or repairs not envisaged for in the instructions
- Modifying, adding or removing parts of electrical equipment without written permission from Connect Work Tools.
- The use of non-original spare parts or parts not recommended by the manufacturer.
- Entrusting maintenance and repair operations to personnel not trained by the manufacturer
- Leaving the system at the end of the work without having implemented the relevant safety procedures
- Carrying out routine maintenance, inspections or repairs without having put the system out of service and having activated the relative procedure.
- Use of the magnet as a battering ram or hammer to align ferrous materials or as a demolition element.
- Use of the magnet as an excavating part.
- Use of the magnet on hot materials, if not envisaged at the time of ordering
- The lifting of loads anchored to the electromagnet with ropes, chains, etc.
- Swinging the load to deposit it out of the vertical configuration.
- In addition, during the maintenance phases it is forbidden to:
 - Use unsuitable means.
 - Operate without personal protection equipment.
 - Intervene without having removed the load lifted and having placed the "maintenance in progress" warning sign on the loader



The electromagnet is a powerful magnetic field generator: it is absolutely forbidden for anyone with valves and artificial heart pacemakers, metal artificial limbs and in any case for anyone carrying any object that could suffer problems generated by magnetic fields (e.g. watches, magnetic cards and credit cards, etc.) to stop near it.

1.7 Preventive measures by the user

- Strictly observe the accident prevention regulations in force in the respective countries.
- Observe all indications of danger and caution.
- Always use work gloves, protective helmet and soundproof headphones (if the work environment is not sufficiently soundproofed).
- The operator assigned to installation and maintenance of the machine must wear clothing appropriate to the work environment and to the situation in which they are located; in particular, they must avoid the use of clothing that is too wide, chains, bracelets, rings or anything else that could become caught in the moving parts of the machine.
- Check at each shift that all mechanical and hydraulic connections with the loader are in good condition.
- Only start the machine when the installation area is clear of unauthorised persons.
- The operator must not carry out operations or interventions on their own initiative that are not within their competence.
- The operator's work areas must always be kept free and clear of any oily, liquid and solid residues as well as of equipment that could constitute a hindrance.

1. INTRODUCTION - continued

1.8 Use conditions

1.8.1 General

Environmental characteristics of the installation area:

- ▶ Temperature from -4° F (-20° C) to 122° F (50° C)
- ▶ Relative humidity from 30% to 80%
- ▶ Maximum altitude. 9,500 ft (3,000 m) above sea level

The system must be installed in a plant located in an environment where the necessary escape routes are guaranteed. The system supplied as standard cannot be used in an environment with vapors, fumes or corrosive and/or abrasive dusts, with risk of fire or explosion and in any case cannot be used in an environment where the use of explosion-proof components is prescribed. The magnet must not work with intermittent duty cycle % beyond the data written in paragraph 2.1.2 (over a period of 10 minutes). In case of use with an intermittent cycle higher than that allowed, or to operate on hot material, contact Connect Work Tools.

1.8.2 Disposal and demolition



It should be noted that for the proper functioning of the electromagnet and the electronic and hydraulic components inside it, the hydraulic supply must not undergo sudden changes in both pressure and flow values.

During the decommissioning phase, for the demolition and disposal of the machine, or of every single part of it, the user purchaser must comply with the rules and regulations in force in their country. By waste it is meant any substance or object deriving from human activities or from natural cycles that have ceased or are intended to be ceased.

Special waste:

- ▶ Waste deriving from industrial, commercial, craft, agricultural and service activities that, in terms of quality or quantity, are not declared similar to municipal waste;
- ▶ Deteriorated and obsolete machinery and equipment.
- ▶ Depleted or damaged batteries

Harmful toxic waste:

For waste oils it is necessary to comply with all local codes, laws and directives. The following are prohibited:

- ▶ any discharge of waste oils into inland surface waters, groundwater, coastal waters and pipelines;
- ▶ any deposit and/or discharge of waste oils that have harmful effects on the soil, as well as any uncontrolled discharge of residues resulting from the processing of waste oils;
- ▶ any treatment of waste oils that causes air pollution above the level set by the provisions in force.



FOR THE DISPOSAL OF SPECIAL AND HARMFUL TOXIC WASTE, IT IS STRICTLY NECESSARY TO CONTACT SPECIALIZED/AUTHORIZED COMPANIES.

1. INTRODUCTION - continued

1.9 First operations

Transportation must be carried out by qualified carriers who are able to ensure correct handling of the material being transported. The manufacturer assumes no responsibility in the case of transportation by the customer or by carriers chosen by the same. During transportation, avoid stacking weights that could cause damage. Bring the packed machine as close as possible to the place of installation, proceed with unpacking being sure to verify that the contents corresponds to the specifications of the order. In the event of damage or missing parts, immediately notify Connect Work Tools and the carrier, submitting photographic documentation.

1.10 Maintenance regulations

It is absolutely forbidden to carry out any maintenance, adjustment or service work while the magnet is in operation. Before carrying out any of these operations, de-energize the magnets by interrupting the oil supply.

Do not modify parts of the machine (connections, holes, finishes, etc.) for any reason. The responsibility for modifications of any kind not authorized in writing by Connect Work Tools falls to the person who performs it.

The machine must be used in accordance with the manufacturer's specifications (technical specifications, safety specifications, etc.).

IMPORTANT: after verification, if necessary, make a reservation on the delivery note, have it countersigned by the carrier and notify, if possible by e-mail, Connect Work Tools.

IMPORTANT Do not tamper with or modify any mechanical, hydraulic or electrical components without prior written authorization.

Any modifications must be authorized by the manufacturer. If the machine is used beyond its limits of use or by altering its characteristics in any way, Connect Work Tools declines all responsibility.

IMPORTANT It is absolutely forbidden to remove or tamper with the safety devices.

IMPORTANT When the machine is in operation, it is absolutely forbidden to come into contact with any part of it (except those indicated in the use and maintenance and manual).

1.11 Handling and transportation

For the unloading and handling of the electromagnet, no special equipment is required. It is necessary to use the chain suspension ring, when present, or the pallet on which it is fixed, and lifting means with a capacity equal to the weight of the electromagnet indicated on the identification plate. For handling and transport operations, the electromagnets must be supported and anchored to a wooden pallet to prevent slipping on the means of transport.

1.12 Warehousing

For proper storage of hydraulic electromagnets, protect machined surfaces where present and place the magnet on a pallet to avoid direct contact with the damp floor. The afore-mentioned material, properly kept, can be stored for a period of approximately two years in covered environments where the temperature is between -4° F (-20° C) to 158° F (70° C) with a maximum humidity of 80% and protected from atmospheric agents. For different environmental conditions, specific packaging must be provided.

2. TECHNICAL SPECIFICATIONS

2. TECHNICAL SPECIFICATIONS OF THE HYDRAULIC MAGNETS

2.1 Description

2.1.1 Electromagnet model



**CMGIC Series
(Chain Mount)**

**CMG42IC - 42" Chain Model
CMG50IC - 50" Chain Mount Model**



**CMGID Series
(Direct Mount w/ Teeth)**

**CMG38ID - 38" Direct Mount Model
CMG42ID - 42" Direct Mount Model
CMG50ID - 50" Direct Mount Model**

2. TECHNICAL SPECIFICATIONS - continued

2.1.2 Technical Data

MECHANICAL DATA						
	Unit of Measurement	CMG38ID	CMG42IC	CMG42ID	CMG50IC	CMG50ID
DIAMETER OF HYDRAULIC MAGNET	in	38	42	42	50	50
WEIGHT OF HYDRAULIC MAGNET	lb	2646*	2315	3086*	3461	4189*
RPM MOTOR - GENERATOR	rpm	2550 ± 50	2650 ± 50	2650 ± 50	2750 ± 50	2750 ± 50
LIFTING CHAIN'S CAPACITY	lb	N/A	20725	N/A	20725	N/A
HYDRAULIC DATA						
	Unit of Measurement	CMG38ID	CMG42IC	CMG42ID	CMG50IC	CMG50ID
MINIMUM REQUIRED OIL FLOW RATE	gal/min	10	10.5	10.5	12	12
MAXIMUM OIL FLOW RATE	gal/min	40	40	40	40	40
MAXIMUM PRESSURE ON HYDRAULIC VALVE BLOCK (MA1)	psi	2600				
MAXIMUM RETURN PRESSURE ON HYDRAULIC VALVE BLOCK (MB1)	psi	220				
ELECTRIC DATA						
	Unit of Measurement	CMG38ID	CMG42IC	CMG42ID	CMG50IC	CMG50ID
THREE-PHASE VOLTAGE AT GENERATOR	V AC	170	170	170	170	170
THEORETICAL VOLTAGE AT THE MAGNETIC PLATE	V DC	220	220	220	220	220
THEORETICAL RESISTANCE AT THE MAGNETIC PLATE	Ω	10.7	8.8	8.8	6.9	6.9
THEORETICAL POWER OF MAGNETIC PLATE	kW	4.5	5.5	5.5	7	7
DUTY CYCLE (@10MIN)	%	50	50	50	50	50
VARIOUS DATA						
	Unit of Measurement	CMG38ID	CMG42IC	CMG42ID	CMG50IC	CMG50ID
RECOMMENDED EXCAVATOR OPERATING WEIGHT	ton	14-17**	19-23**	19-23**	26-32**	26-32**
TYPE OF COUPLING HYDRAULIC HOSES	English	-16 ORFS (O-Ring Face Seal)				

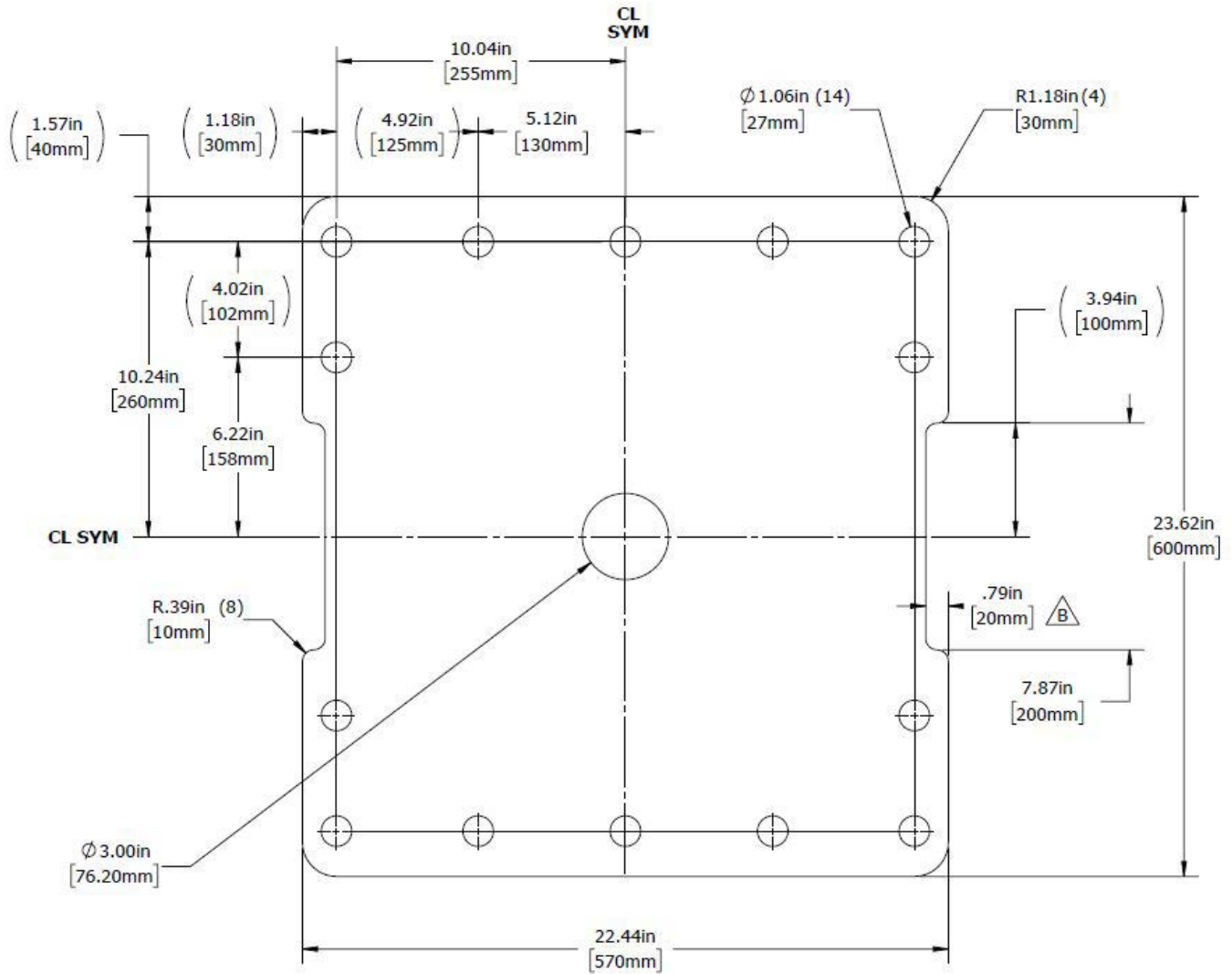
The values marked with * refer to an average weight. They may vary according to the size of the top fixing plate.

Values marked with ** are indicative. Targeted installations can be evaluated with the flow diagram on the operating machine.

2. TECHNICAL SPECIFICATIONS - continued

2.1.3 Bolt Patterns - CMG38/CMG42

CMG38/CMG42



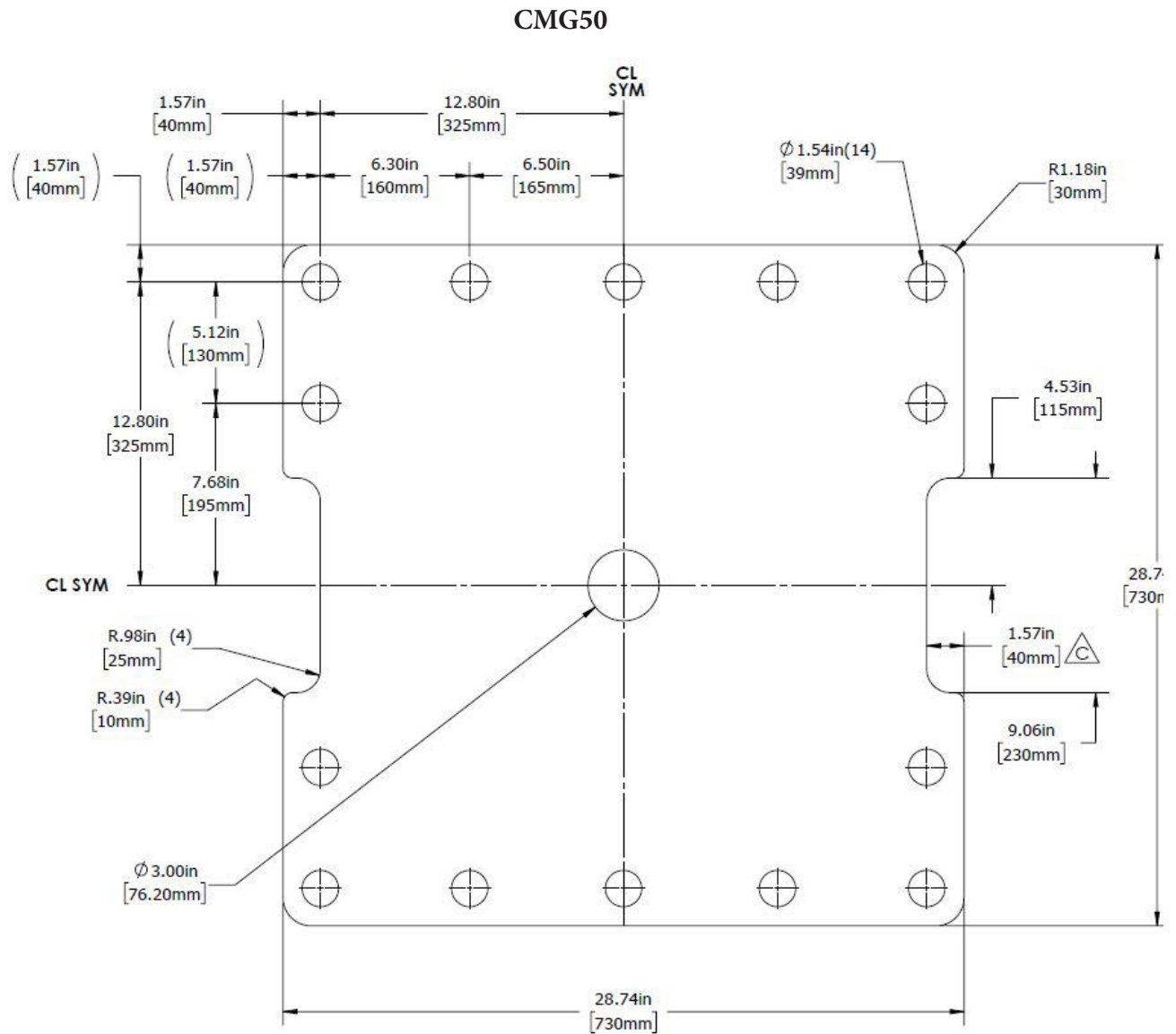
NOTICE Mounting Plate is 1.25" (31.75mm) thick.

Mounting Plates for the CMG38/CMG42 are available

Model	Part No.
CMG38/CMG42	CHE00104

2. TECHNICAL SPECIFICATIONS - continued

2.1.4 Bolt Patterns - CMG50



NOTICE Mounting Plate is 1.25" (31.75mm) thick.

Mounting Plates for the CMG50 are available

Model	Part No.
CMG50	CHE00105

2. TECHNICAL SPECIFICATIONS - continued

2.1.5 System composition

The hydraulic electromagnet consists of a circular metal base which houses the electric winding and of a metal cover inside which the electrical and hydraulic components used for the generation of the electric current and for the control of the magnet are installed.

The excitation and deexcitation of the magnet take place by means of the hydraulic circuit of the machinery/excavator to which the magnet is connected. Therefore, the hydraulic electromagnet has no controls of its own but exploits the controls of the operating machinery's hydraulic system.

Both the base and the magnet cover have different models according to the required installation and work.

The CMGIC series has a three-legged chain with a central master link for the fixing to a hook. The base of the magnet is smooth and circular in shape.

The CMGID series has a drilled plate for being fixed to the bracket of the operating machinery/excavator. The size of the plate and type of drilling depends on the type of bracket to be fixed. The base of the magnet is circular with two sets of three "teeth". The teeth allow the removal of the debris from which the ferrous scrap has to be extracted. They are not suitable for digging or crushing.

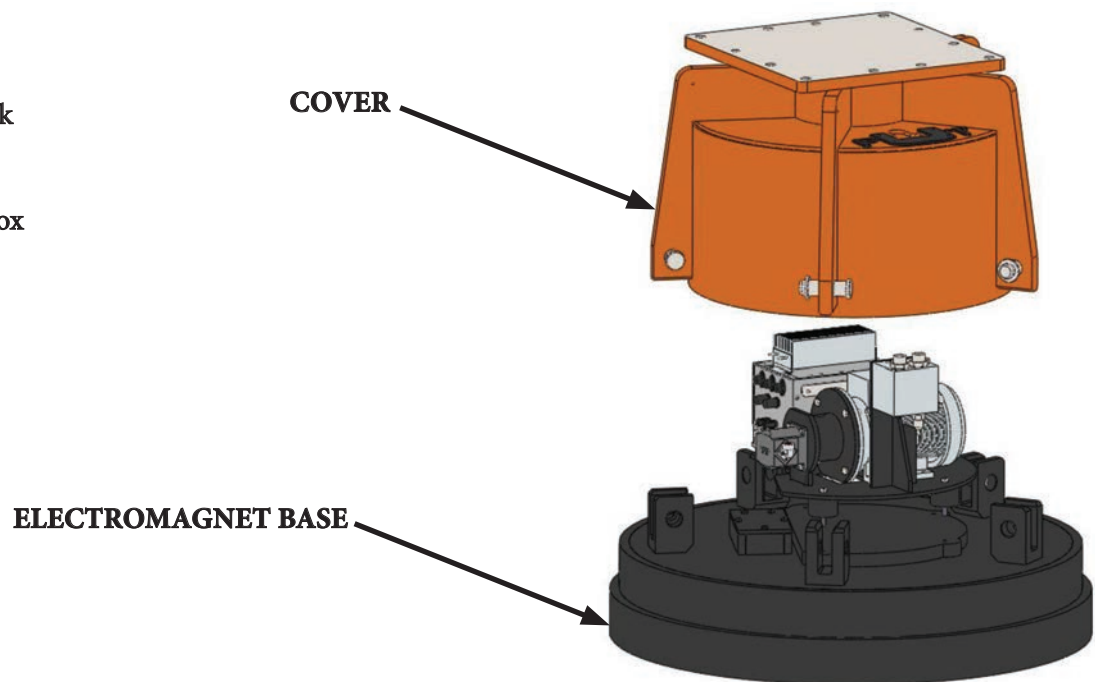
The winding element inserted in the base is made of aluminium or copper wire or tape with insulation class F or better, encapsulated with bicomponent polyurethane resin.

The overall protection degree of the hydraulic electromagnet is IP54.

The cover is fixed to the base by means of 3 or 5 pins.

Inside the cover of each magnet series (CMGIC and CMGID) are the following main components:

1. Hydraulic Valve Block
2. Hydraulic Motor
3. Electric Generator
4. Electronic Control Box



2. TECHNICAL SPECIFICATIONS - continued

2.1.6 S/N plate - identification data

Each hydraulic magnet is identified by a serial number (S/N) plate showing the main data of the machine. For any communication with the manufacturer, always mention these references.

CONNECT™ WORK TOOLS	
Model Number:	
Serial Number:	
Flow:	GPM
Pressure:	psi
Weight:	lbs
Power:	kW
Voltage:	V
Manufactured:	

CME00001

2.1.7 Signs and stickers

Below are the main signals applied to the machine. They can be supplemented, depending on the end use, by more specific signals.



Attention to the presence of an intense magnetic field.



Prohibited to wearers of electronic medical devices or pacemakers.



Warning high voltage danger.



Keep at a safe distance of 75 ft (23 m): danger of flying objects.

All data contained in the plates and stickers must always be legible. They must be cleaned periodically. If a plate deteriorates and/or is no longer legible, even if only partially, it is necessary to ask the manufacturer for another one.

2. TECHNICAL SPECIFICATIONS - continued

2.2 Installation and setting

2.2.1 First operations

THE CUSTOMER USING THE ELECTROMAGNET HAS THE OBLIGATION TO:

- 1) Provide a large maneuvering area free from elements that may cause tripping or obstacles and of a size suitable for the size of the equipment, and such as to guarantee:
 - a. Operating spaces
 - b. Passage ways
 - c. Escape routes
- 3) Prepare the lifting means suitable for handling the magnet according to its weight.
- 4) Ensure that the personnel in charge are equipped with the PPE required for this activity, in accordance with the laws in force in the country of installation.
- 5) Ensure that the personnel in charge have read this manual and have been trained.
- 6) Make sure that the maneuvering area blocked off from passage, by means of protective barriers.
- 7) Apply, in a clearly visible way, special warning signs relating to the presence of suspended loads and the presence of a magnetic field, and signs prohibiting access.
- 8) Check that the operating machinery is suitable for installing the hydraulic magnet (load capacity, hydraulic parameters).
- 9) Check that the hydraulic system of the operating machinery is suitable for use with a hydraulic magnet.
- 10) Check that the hydraulic system of the operating machinery is built in accordance with the law, and the relative commands must identify without error or doubt the effects they produce on the hydraulic magnet.
- 11) Make sure that the hydraulic system of the operating machinery to which the hydraulic magnet will be installed provides a constant oil flow without changes in flow rate and pressure.



12) Make sure that the electromagnet works EXCLUSIVELY through the operating machinery on which it is installed and from which it receives the feed oil.



13) Make sure that at the start of the operating machinery there are no uncontrolled movements/ actions of the electromagnet.



14) Make sure that when the operating machinery is switched off, all hydraulic flows to or from the electromagnet are interrupted.

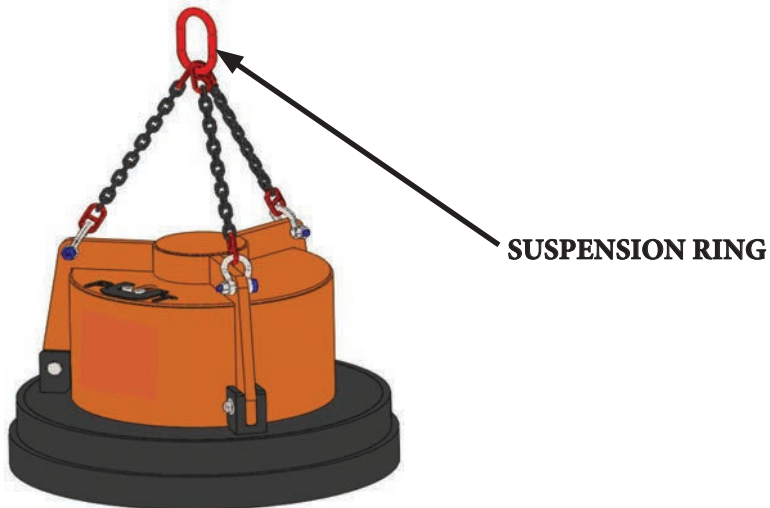


15) Make sure that any residual pressures present in the hydraulic circuit are safely eliminated (depressurization) before any installation or maintenance of the electromagnet.

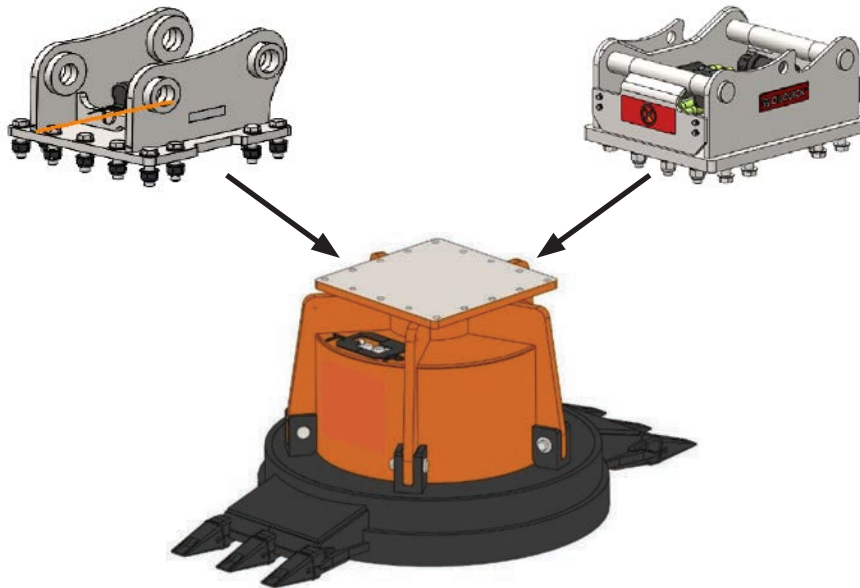
2. TECHNICAL SPECIFICATIONS - continued

2.2.2 Installation constraints - mechanical connection

In the CMGIC series, the electromagnet is equipped with a suspension system with a central master link and three leg chain. The magnet must be hooked to the lifting device by means of the central ring. Check the suitability of the lifting device.



In the CMGID series, the electromagnet is equipped at the top with a suitably drilled plate for fixing the bracket of the loader, not always supplied by Connect Work Tools. The bracket is fixed to the magnet by means of appropriate bolts, and the bracket is fixed to the loader by means of two pins of variable dimensions according to the coupling of the loader.



Check and clean the two contact surfaces between the bracket and the cover plate.

Position the bracket in the correct direction and secure it with the relative bolts.



THE BOLTS MUST BE TIGHTENED ACCORDING TO THE REFERENCE STANDARD ACCORDING TO THE SIZE OF THE BOLT.

The user must verify the suitability of the aforementioned connections according to the type of load and the maximum stresses induced in the lifting device.

2. TECHNICAL SPECIFICATIONS - continued

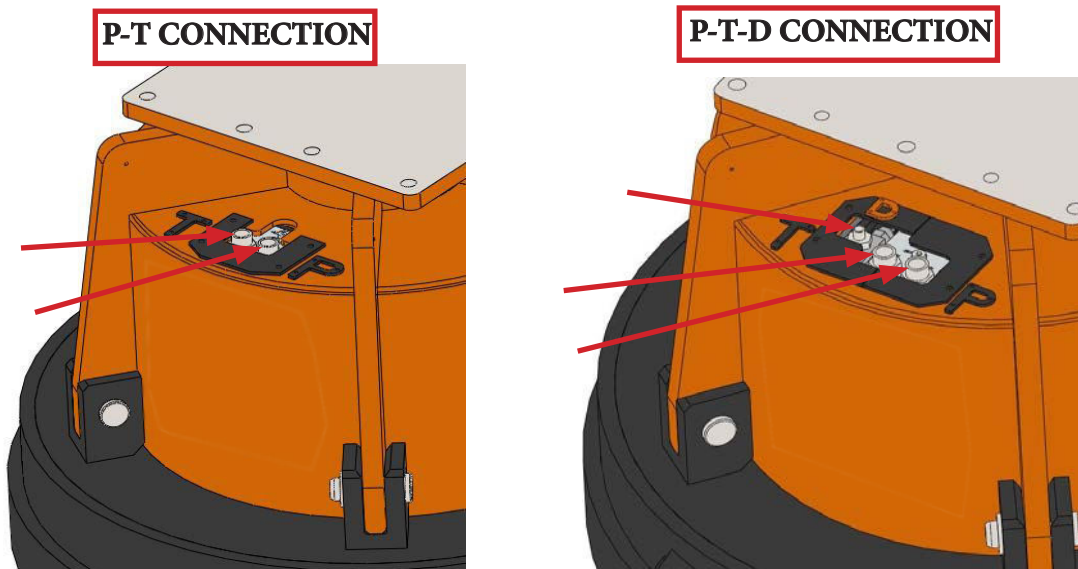
2.2.3 Installation Constraints – hydraulic connection

On the upper part of the cover there is an opening in which the hydraulic pipes coming from the loader arm must be connected for supplying the magnet. There are two -16 ORFS fittings for connection with the valve inside the magnet.

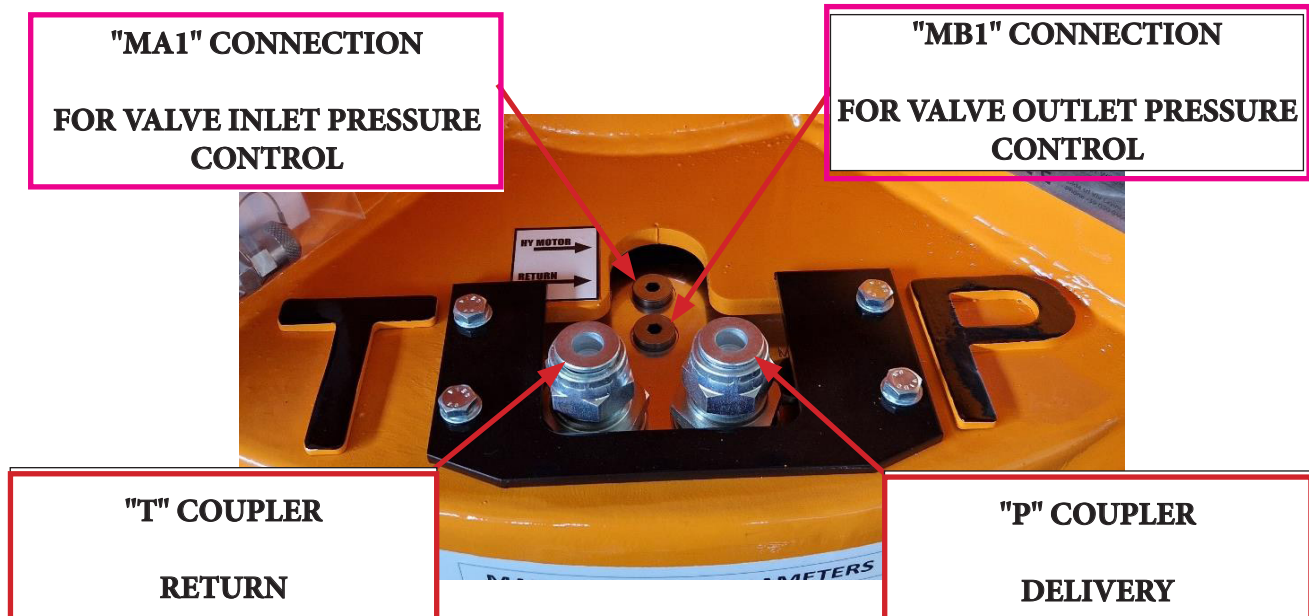
A nipple is identified with the letter **P** (Pressure) to which the **delivery** hose will be connected by means of a -16 ORFS fittings.

A nipple is identified with the letter **T** (Tank) to which the **return** hose will be connected by means of a -16 ORFS fittings.

Depending on the system of the machinery on which the magnet will be installed, there may be a third connection identified with the letter **D** (Drain) for the connection of the drainage hose. Connection via 3/8" nipple with 3/8" BSP cylindrical gas swivel female fitting.



CONNECTION OF HOSES AND PRESSURE POINTS:



2. TECHNICAL SPECIFICATIONS - continued

2.2.4 Installation – functional checks

The hydraulic electromagnet does not need any adjustment and is ready to be connected mechanically and hydraulically to the operating machinery.

Once mechanically connected, as described in paragraph 2.2.2, the hydraulic hoses of the operating machinery system must be connected as described in the paragraph 2.2.3.

IMPORTANT

THE CIRCUIT OF THE OPERATING MACHINERY, EXCAVATOR, TO WHICH THE MAGNET IS CONNECTED, MUST BE AN OPEN CENTER CIRCUIT. THE OIL RETURN, LETTER T, MUST BE DISCHARGED DIRECTLY INTO THE TANK.

IMPORTANT

COMPLY WITH AND CHECK THE HYDRAULIC FLOW AND PRESSURE VALUES. TOO HIGH VALUES CAN CAUSE THE MAGNETIC SYSTEM TO BREAK. TOO LOW VALUES CAN CAUSE MALFUNCTIONS OF THE MAGNETIC SYSTEM.

PLACE THE MAGNET ON THE GROUND AND PERFORM THE FOLLOWING INSTALLATION PROCEDURE:

1. Adjust the oil flow on the operating machinery with a value between the minimum flow and the maximum operating flow. (paragraph 2.1.2).
2. Adjust the maximum oil pressure on the operating machinery in such a way that on the pressure point MA1 there is a maximum pressure of 2600 psi (180 Bar).

CAUTION

SUBSEQUENT OPERATIONS MUST BE CARRIED OUT WITH THE OPERATING MACHINERY STOPPED AND SWITCHED OFF AND WITH THE HYDRAULIC POWER OFF. ALL RESIDUAL PRESSURES MUST HAVE BEEN PREVIOUSLY DISCHARGED.

3. Connect the delivery hose to the nipple identified by the letter P.
4. Connect the return hose to the nipple identified by the letter T.
5. Connect, if present, the drainage hose to the nipple identified with the letter D.
The drain hose of the machine must go directly to the drain.
6. Connect a pressure gauge with a scale from 0 to 3600 psi (0 to 250 bar), through a 10 ft (3 m) hose to the pressure point MA1 located on the valve block. (inlet pressure control)
7. Connect a pressure gauge with a scale from 0 to 360 psi (0 to 25 bar), through a 10 ft (3 m) hose to the pressure point MB1 located on the valve block. (outlet pressure control - counter-pressure)
8. Move about 5 ft (2 meters) away from the magnet, keeping the pressure gauges with you.
9. Start the operating machinery
10. Operate the oil flow and keep it active for 30-40 sec. = THE MAGNET MAGNETIZES.
11. Check the pressure gauge of the pressure point MA1 and check that the pressure is not higher than 2600 psi (180 bar).

2. TECHNICAL SPECIFICATIONS - continued

12. Check the pressure gauge of the pressure point MB1 and check that the pressure is not higher than 220 psi (15 bar). If the pressure is higher than 220 psi (15 bar) when the drainage is connected, a safety valve activates the drainage in order to relieve the counter-pressure.

13. Disengage the oil flow control from the operating machinery and ensure that the pressures go to zero = THE MAGNET IS DEMAGNETIZED.

14. Repeat the sequence from point 9 to point 12 checking the pressures, that the oil flow remains constant and that there are no abnormal noises.

15. Turn off the machine and discharge the residual pressures in the system.

16. Remove both pressure gauges and screw the plugs into the supplied pressure points MA1 and MB1.

17. The hydraulic magnet is ready for use.



DO NOT use this equipment if any anomalies are found during the verification phase. Contact Connect Work Tools customer service for technical support.

2.3 Operation

The hydraulic electromagnet is designed for the handling of ferrous material, in particular metal scrap, aimed at the recycling industry.

Suitable for installation on loaders, earthmoving machines and similar machinery equipped with an adjustable auxiliary hydraulic circuit.

As described in chapters 2.2.2 and 2.2.3, the magnet must be mechanically and hydraulically connected to the operating machinery in order to operate.

The basic principle of operation of the electromagnet is the following: the direct current, flowing to the coil made of conductive wire, generates a magnetic field. This magnetic field is conveyed into the metal casing and reaches the lower surface of the base, the area where the ferrous material is attracted. As long as the electric current continues to flow, the magnetic field remains and the material remains attracted to the magnet.

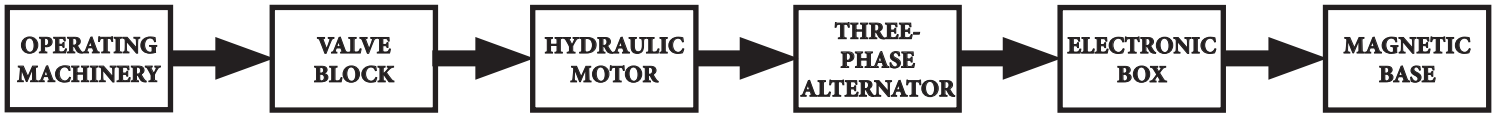
Once the electric current is interrupted (hydraulic flow interruption), the magnetic field also disappears and the attracted material detaches.

The generation of the necessary electric current is carried out by means of a three-phase alternator, set in rotation by means of a hydraulic motor connected to the hydraulic system of the machinery/excavator. The external "TEETH" in the CMGID version must ONLY be used for removing the ferrous parts from the debris.

The CMGID magnet must absolutely NOT be used as a means of excavation.

2. TECHNICAL SPECIFICATIONS - continued

2.3.1 Operating logic



The hydraulic supply and therefore the magnet control, are provided by the operating machinery on which the hydraulic electromagnet is installed, through the control lever located in the cabin.

The connection of the hoses coming from the operating machinery is carried out on the valve block inserted in the cover. This valve block has the function of conveying only the necessary flow to the engine and sending the remaining is directly to discharge.

(EXCESSIVE FLOW, BEYOND THE VALUES INDICATED, CAUSES HIGH INTERNAL PRESSURES THAT AFFECT THE MECHANICAL SEAL OF THE COMPONENTS.)

In the valve block there is a relief valve that protects the system from any pressure peaks as far as possible.

Once the hydraulic motor is put in rotation through an elastic joint, the three-phase generator also starts supplying the alternating current to the electronic box. The electronic box transforms the alternating current into direct current, the flows to the magnetic base where the magnetic field, necessary to attract the ferrous material, is generated.

Once the supply control is turned off, the oil flow stops, stopping consequently the motor and the generator, therefore blocking the power supply and the magnetic field: the attracted material is released.

2.3.2 Enabling for use

Before starting the operation with the electromagnet, the following operations must be performed:

- ▶ visually check the condition of the state of wear of the suspension systems (chains, rings, lifting ears, eyebolts, ropes, etc.);
- ▶ Check the correct hydraulic connection of the supply hoses;
- ▶ After that, the following are ALWAYS necessary:
 - follow the instructions given in this manual and in the manual of the operating machinery;
 - comply with the instructions and warnings highlighted: the warning plates displayed on the system and in the manoeuvring areas are accident prevention signs and must be perfectly legible;
 - check the compliance of the performance of the system in relation to the service for which it is intended (work cycles - intermittence - time of use - load to be handled);
 - make sure, before starting any manoeuvre, that the work area is free from obstacles;
 - ascertain correct maintenance has been performed;
 - be sure to have centred the lifting unit on the load before handling it;
 - make sure that the load during handling operations (lifting, moving) does not encounter obstacles;
 - warn the personnel working in the manoeuvring area of the start of load handling operations, if the service area is not segregated;
 - operate the various movements avoiding producing blows;
 - use the "slow" speeds for the approach and positioning of the load;
 - cut off the power supply and discharge the residual pressures in the event of inspections, repairs, maintenance interventions;
 - for all operations, wear suitable work clothing, in compliance with the safety regulations in the work environment;
 - report any malfunctions (faulty behavior, suspected breakage, incorrect movements and abnormal noise) to the department manager and put the accessory out of service;
 - comply with the maintenance program and record any observations at each check;

2. TECHNICAL SPECIFICATIONS - continued

2.3.3 Work cycle

Once the initial checks and the requirements described in the previous chapters have been accomplished, the work cycle can be carried out:

1. Make sure that there are no people or animals within the working range of the operating machinery. The work area must be segregated and clearly indicated with signs;
2. Make sure you have a good and wide visibility of the work area;
3. Make sure that it is not possible to damage things (structures, buildings, etc.) that are not part of the work activity;
4. Proceed with the operating machinery towards the work area;
5. Place the hydraulic magnet above the material to be moved, as far as possible in contact with the lower surface of the magnet base;
6. Operate and keep activated the oil delivery control to activate the magnet;
7. Lift the material
8. Direct the magnet towards the unloading area;
9. Once the unloading area is reached, release the delivery command;
10. Wait for all the material to be released from the magnet;
11. Reposition yourself on the new work area.

 **ATTENTION: the area of operation of the magnet must be strictly segregated and equipped with appropriate signage.**

 **Cooling of the magnet in water is prohibited.**

2.3.4 Deactivation of the electromagnet

To deactivate the system, after releasing the load, (i.e. demagnetizing the magnet) comply with the following provisions:

- the system remains hooked to the lifting device: in this case it must be lifted to a height of not less than 8 ft (2.5 meters) such as not to create disturbance or danger to persons below the lifting equipment.
- the system is removed from the operating machinery: in this case it is necessary to place the magnet in a secluded place in order to avoid possible tripping.

The magnet should not be placed in direct contact with the ground but instead on trestles, rails or pallets to reduce the possibility of moisture penetration through cracks or damaged welds, especially when the magnet is hot.

2. TECHNICAL SPECIFICATIONS - continued

2.4 Characteristics of the material to be handled

The characteristics of the material to be handled must correspond to those defined at the time of ordering. They are generally identifiable in:

- ▶ **Dimensions and weight:** Scrap of various sizes, plates, demolition balls
- ▶ **Composition of the steel constituting the material to be handled:** low alloyed steel, high alloys, cast iron, etc. (alloyed steels have a different magnetic behavior depending on the content of the alloy elements present, which is reflected in a variation in the capacity of the magnet).
- ▶ **Air gap:** (e.g.: for plates) this term means the distance that is created between the poles of the magnet and the contact surface of the material, due to surface defects, dirt, interposed non-magnetic material (the greater the air gap and the less the lifting capacity of the magnet).
- ▶ **Temperature.** The temperature of the material affects the load capacity of the magnet. With cold material - max. temp. 122°F (50°C) the magnet has the maximum load capacity.



If there is a need to handle materials with characteristics different from those originally envisaged for the magnet, it is necessary to contact the supplier to establish any capacity reductions to be applied.

For this type of magnet, the following indicative capacities are shown below:

MODEL	INDICATIVE AVERAGE CAPACITY WITH HOT MAGNET (lbs)						
	TEAR STRENGTH	SLABS OR BLOCKS	DEMOLITION BALL	PIG IRON	SCRAP GRADE 3A (55 lb/ft ³)	SCRAP GRADE 24 (60 lb/ft ³)	SCRAP GRADE 40 (50 lb/ft ³)
CMG38ID	22,000	11,000	4,500	500	400	400	200
CMG42IC/CMG42ID	24,000	12,000	5,500	600	550	500	250
CMG50IC/CMG50ID	31,000	15,000	7,000	900	800	750	400

2.5 Non-permitted loads

- ▶ Loads whose weight exceeds the capacity of the system;
- ▶ Constrained loads;
- ▶ Loads not specified in this manual or with a Connect Work Tools representative.

3. SAFETY

3 SAFETY

3.1 Residual risks

Definition: the residual risk is due to a danger that cannot be totally reduced through design and protection techniques, that is, a danger that is potentially not evident.

The residual risks and solutions to be adopted by the user are listed below:



DANGER OF PRESENCE OF INTENSE MAGNETIC FIELD:

It is prohibited to stay near the place where the electromagnet is used to wearers of valves and artificial cardiac stimulators, artificial metal limbs and in any case to anyone carrying any object, which could cause problems generated by magnetic fields (e.g.: watches, magnetic credit cards, magnetic cards, etc.). Remain at least 30 ft (10 meters) away from the magnet.



DANGER OF PRESENCE OF INTENSE MAGNETIC FIELD:

to ensure the safety of operators within the machine's range of action, it is necessary to establish an area within the personnel cannot enter or remain during the lifting operation phases.



RISK OF ELECTROCUTION:

When the electrical control equipment is activated, a dangerous voltage of 220 VDC is present on the magnet. Do not open or disassemble protective casings when the magnet is active.



DANGER OF RUPTURE OF HYDRAULIC HOSES:

Breaking or damaging the hydraulic flex hoses can cause their movement with a whipping effect, interrupting the supply of the magnet and causing the loss of load. Do not remain in the operating range of the machine. Check regularly and replace faulty hoses.



SLIPPING DANGER:

Any leaks of lubricant and/or processing residues in the areas surrounding the interchangeable equipment may cause the personnel in charge of the use, operation and maintenance of the hydraulic magnet to slip. Keep the areas clean and always access them with non-slip shoes.

3.2 Noise emissions

The weighted equivalent sound pressure level (A) in close proximity of the hydraulic magnet does not exceed 70 dB. The maximum value of weighted instantaneous acoustic pressure (C) in close proximity of the hydraulic magnet does not exceed 130 dB. Other phonometric surveys in the environment must be carried out in accordance with the regulations in force in the country of installation.



Refer to the use and maintenance manual of the operating machinery for any PPE necessary for hearing protection

3. SAFETY - continued

3.3 Lighting

The hydraulic magnet is not equipped with lighting.

The lighting of the installation area must comply with the regulations in force in the country where the installation takes place and, in any case, the good lighting of each part of the operating machinery must be ensured.

 **CAUTION** The hydraulic magnet must be used in an environment with suitable lighting.

3.4 Safety devices

There is no emergency stop button on the hydraulic electromagnet since it is powered by the operating machinery and therefore any devices that stop the oil flow from the machine to the magnet are on the machine itself.

 **NOTICE** Any emergency device that interrupts the oil flow to the magnet will cause the loss of the loaded material.

 **CAUTION** Before putting the system into operation, it is mandatory to verify that the fixed guards and safety devices are intact and installed.

4. MAINTENANCE / COMPONENT REPLACEMENT

4 MAINTENANCE / COMPONENT REPLACEMENT

4.1 General indications

The employer has a legal obligation to keep the systems and protective devices in a good state of maintenance so that they are safe. Regular maintenance involves carrying out periodic checks to ascertain the state of health of the equipment and components.

The above presupposes that the maintenance interventions are carried out by specialized personnel, who know the equipment well and know how to intervene, at the same time, both for ordinary operations and for interventions in the event of failure or anomalies.

The maintenance program includes ordinary interventions, which include inspections, checks and verifications carried out directly by the operator and/or by personnel assigned to normal company maintenance and periodic operations that include control and replacement operations carried out by personnel trained for this purpose by the manufacturer through specific courses.



ATTENTION: before performing any maintenance operation it is necessary to interrupt the power supply. All machine maintenance operations must be performed with the machine on a flat level and locked in place.

4.2 Routine maintenance

Routine maintenance requires the following tools:

1. ohmmeter for winding resistance measurement
2. mega-ohmmeter (at 500 V) for measurement of insulation to ground
3. normally available tools

These operations are divided into:

Daily interventions by the operator:

- ▶ general visual checks;
- ▶ functional checks (test buttons and batteries, if installed);
- ▶ checks on the condition of chains and other types of coupling.

Weekly interventions by specialist personnel:

- ▶ visual inspection of each mechanism;
- ▶ checking of the functionality and integrity of all cables.

Monthly interventions by specialist personnel:

- ▶ check the efficiency of chains and other types of coupling.
- ▶ verification and cleaning of the fittings;
- ▶ checking the efficiency and integrity of the power supply line and of its components;
- ▶ verification of the efficiency and state of preservation of the structure.

4. MAINTENANCE - continued

4.3 Periodic maintenance

Includes maintenance work related to the replacements of small parts. During maintenance, both of the mechanical and electrical parts, it is necessary to turn off the main switch and affix a sign on the machine with the indication "machine under maintenance".

For the individual parts of the machine, observe the following instructions, bearing in mind that the electrical measurements must be carried out with the magnet disconnected from the power supply system, in the area closest to the output cables from the winding, possibly by opening the connection box itself.

Cold resistance: It should be noted that the winding resistance increases by approximately 4% for each 20°F (10°C) increase in the winding temperature with respect to the reference ambient temperature 77°F (25°C.). Therefore, if the magnet is not allowed to cool completely after the last insertion, or in the presence of a high temperature, the resistance value read will be higher than that shown in table 2.1.2

Ground insulation: the insulation reading, measured between a winding terminal and the ground terminal, must normally be not less than 1 megaohm with the magnet cold and 0.1 megaohm with the magnet hot 300°F - 350°F (150°C - 180°C).

Polar expansions: these are the parts of the magnet that come into direct contact with the material to be handled. For this reason, they are subject to wear. A periodic inspection allows the identification of potentially dangerous situations or of poor efficiency. Check the polar expansions to identify:

- ▶ presence of air gap between polar expansion and magnet polarity, which could cause a magnet capacity reduction;
- ▶ presence of cracks on the connection welds, which weaken the mechanical structure and can cause sudden detachment of the polar expansion from the magnet body;
- ▶ mechanical wear: it is present especially when the magnet is intended for the handling of highly abrasive materials. It is necessary to check that the wear is not such as to affect the welding between the bottom cover and the polar expansions. Excessive wear also entails a substantial reduction in the contact surface with a consequent reduction in the capacity of the magnet.

In the case of movement of flat material (plates, billets, slabs, etc.) it must be verified that all the polarities of the magnet are coplanar.

Cover in anti-wear non-magnetic steel: in many cases it comes into direct contact with the material to be moved, so it is subject to the same problems of polar expansions. Check it periodically in order to identify the possible presence of:

- ▶ cracks or splits also in the welds connecting with the casing which allow the passage of humidity towards the winding, causing damage towards the ground;
- ▶ dents or significant deformations: as the winding could be in direct contact with the internal surface of the cover, any deformation could damage it or break the insulation layer.

Chains and hanging ears: periodically inspect chains, hanging ears, and all coupling points. Check that the lug connection welds with the cover are not cracked. It is forbidden to weld a chain component, as welding can affect the quality of the steel and cause it to break.

Storage: To avoid the penetration of moisture through damaged welds or defects in the tightness of seals, it is advisable to store the magnet not in contact with the ground, when not in use.

5. TROUBLESHOOTING

5 TROUBLESHOOTING

5.1 General malfunctions

The hydraulic magnet does not work:

1. The motor does not rotate and the magnet does not lift; check the integrity of the motor and valve.
2. Check that at pressure point MA1 (valve inlet pressure) there is pressure within a time interval of 5 sec. If the revolutions of the motor-generator do not reach correct values within 5 seconds, the electronic system stops the cycle.
3. Check the fuses on the electronic control box.
4. Check the electronic control box following the diagram on the next page.

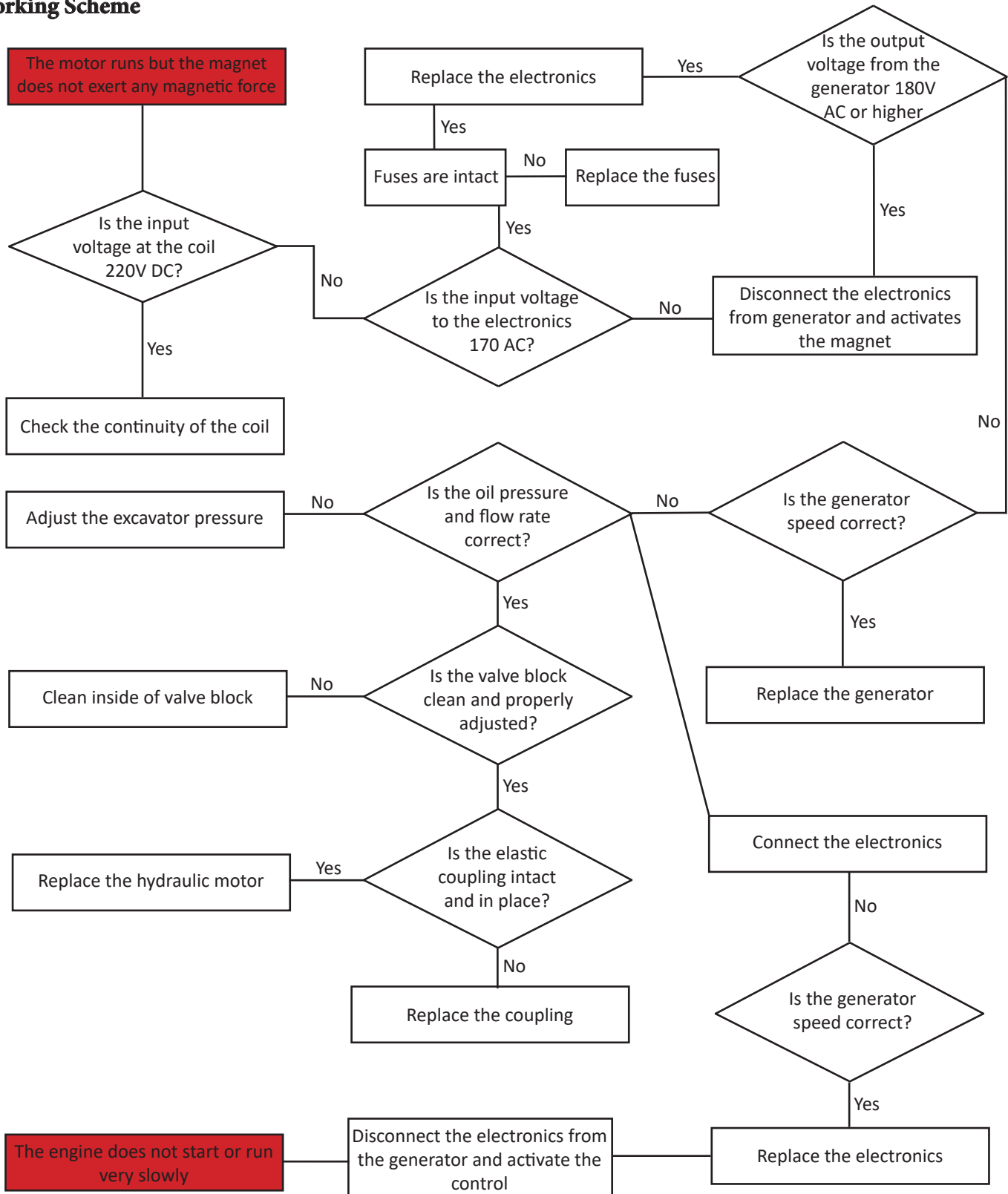
The magnet operates abnormally:

1. The magnet activates normally but it does not lift the load; follow the troubleshooting diagram on the next page.
2. The magnet lifts the load but it does not release it, check that the electronics are intact.
3. The magnet loses the load without the control lever being brought to the oil stop position, check for irregularities in the oil flow rate from the operating machinery.

5. TROUBLESHOOTING - continued

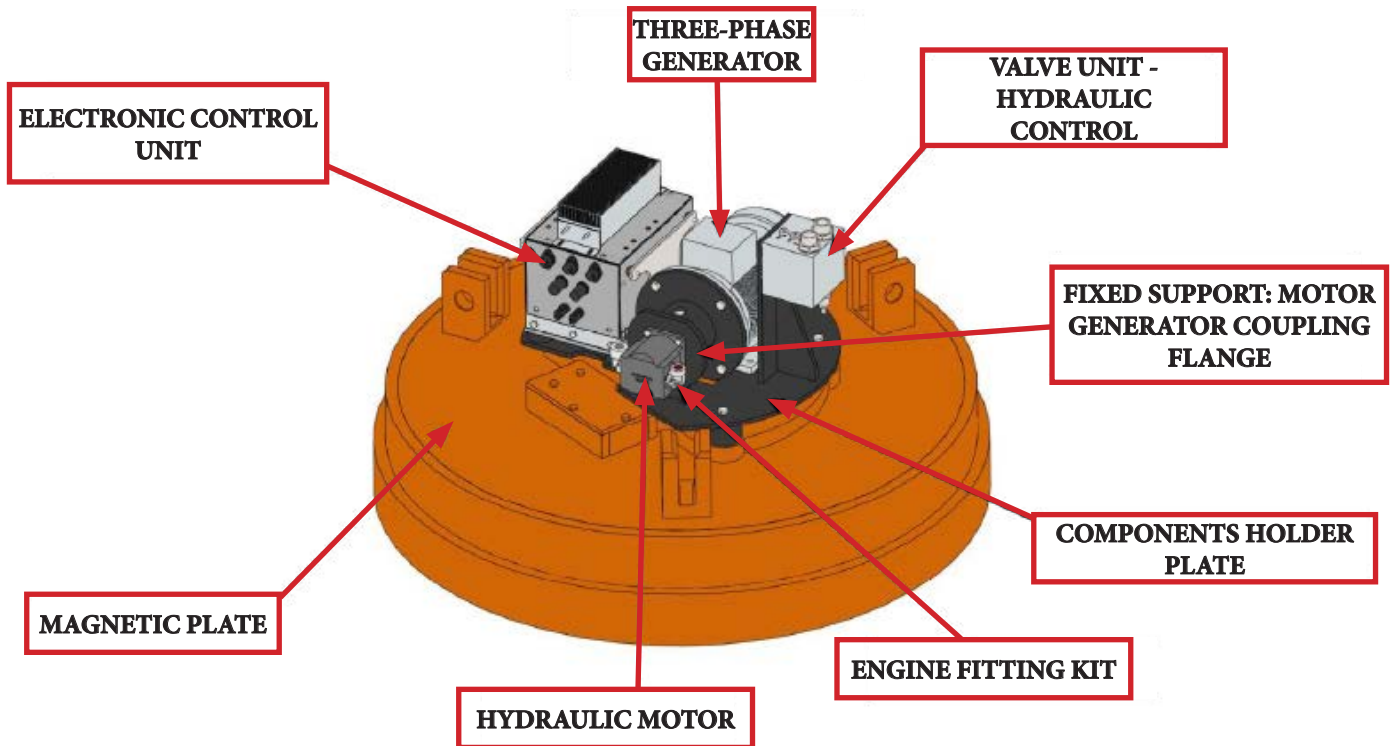
5.2 Troubleshooting procedure

Working Scheme



5. TROUBLESHOOTING - continued

5.3 Main components layout from CMG38 to CMG50



5. TROUBLESHOOTING - continued

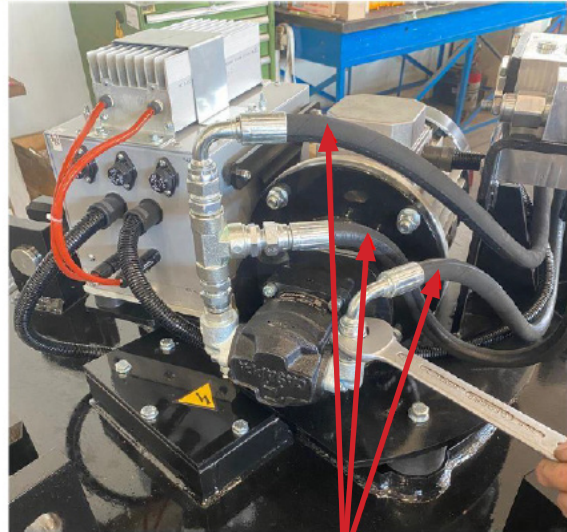
Please note: All the operations indicated below must be carried out after the magnet and the hydraulic hoses have been disconnected from the machine.

5.3.1 Hydraulic motor replacement from CMG38 to CMG50

PROCEDURE

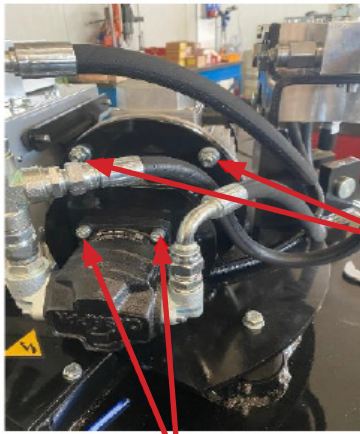
1. Disconnect the flex hoses from the hydraulic motor by plugging them to avoid pollution.
2. Remove the screws securing the hydraulic motor to the fixed support.
3. At this point it is possible to remove the hydraulic motor from the fixed support.
4. Unscrew the elastic joint including the washer from the existing motor.
5. Install the elastic joint, including the washer, on the shaft of the new hydraulic motor, fixing it with the locking nut.
6. Insert the new hydraulic motor and secure it with the appropriate screws.
7. Connect the hoses to the hydraulic motor.
8. Proceed to check the general operation.

FIGURE 4.3



HYDRAULIC MOTOR FLEX HOSES

FIGURE 4.4



GENERATOR FIXING SCREWS

HYDRAULIC MOTOR FIXING SCREWS

FIGURE 4.5



GENERATOR SIDE ELASTIC SEMI-JOINT

HYDRAULIC MOTOR SIDE ELASTIC SEMI-COUPLING

5. TROUBLESHOOTING - continued

5.3.2 Replacing the elastic coupling

PROCEDURE

For models from CMG38 to CMG50, follow the procedure for replacing the hydraulic motor (chapter 4.3.1) but, having reached point 5, replace the elastic joint with a new one. The replacement operation must be carried out both for the elastic semi-joint installed on the hydraulic motor; and on the elastic semi-joint installed on the generator shaft.

5.3.3 Hydraulic block cleaning / replacement

INTRODUCTION

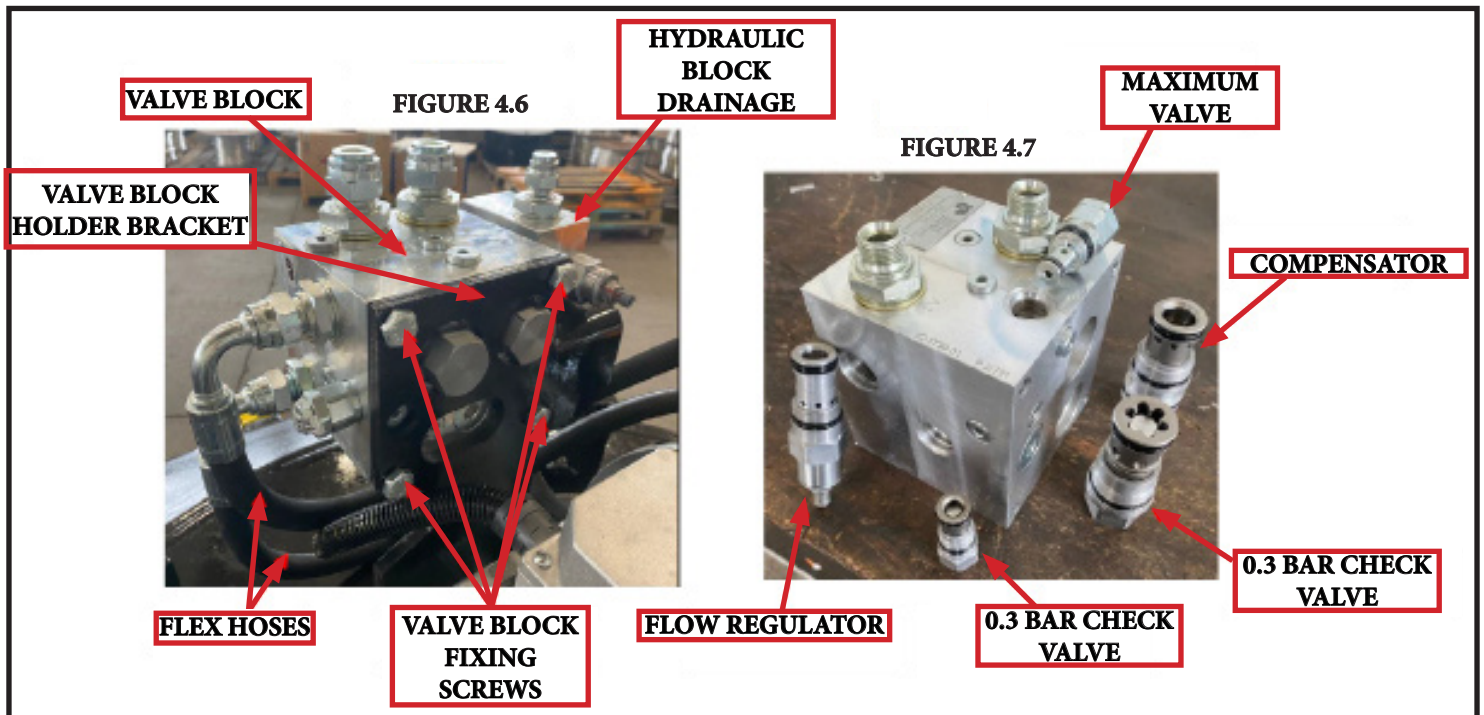
Before proceeding with the complete replacement of the valve block, it must be ensured that inside the hydraulic circuit of the valve block there is no dirt and any foreign bodies that prevent the regular function.

VALVE BLOCK CLEANING PROCEDURE

1. Disconnect the flex hoses placed on the side of the valve block by marking their position.
2. Unscrew the valve block fixing screws from the valve block holder bracket.
3. Once the valve block is disconnected from all the fasteners; unscrew all the cartridges inserted in the valve block as shown in FIG. 4.7.
4. Clean all disassembled cartridges and cartridge seats on the valve block with compressed air, so as to expel any dirt.
5. Screw all cartridges back to the valve block verifying that the ORs of the cartridges are not damaged.
6. Screw the valve block back to the bracket with the appropriate screws.
7. Connect the flex hoses to the valve block marked in point 1.
8. Proceed to functionality check.

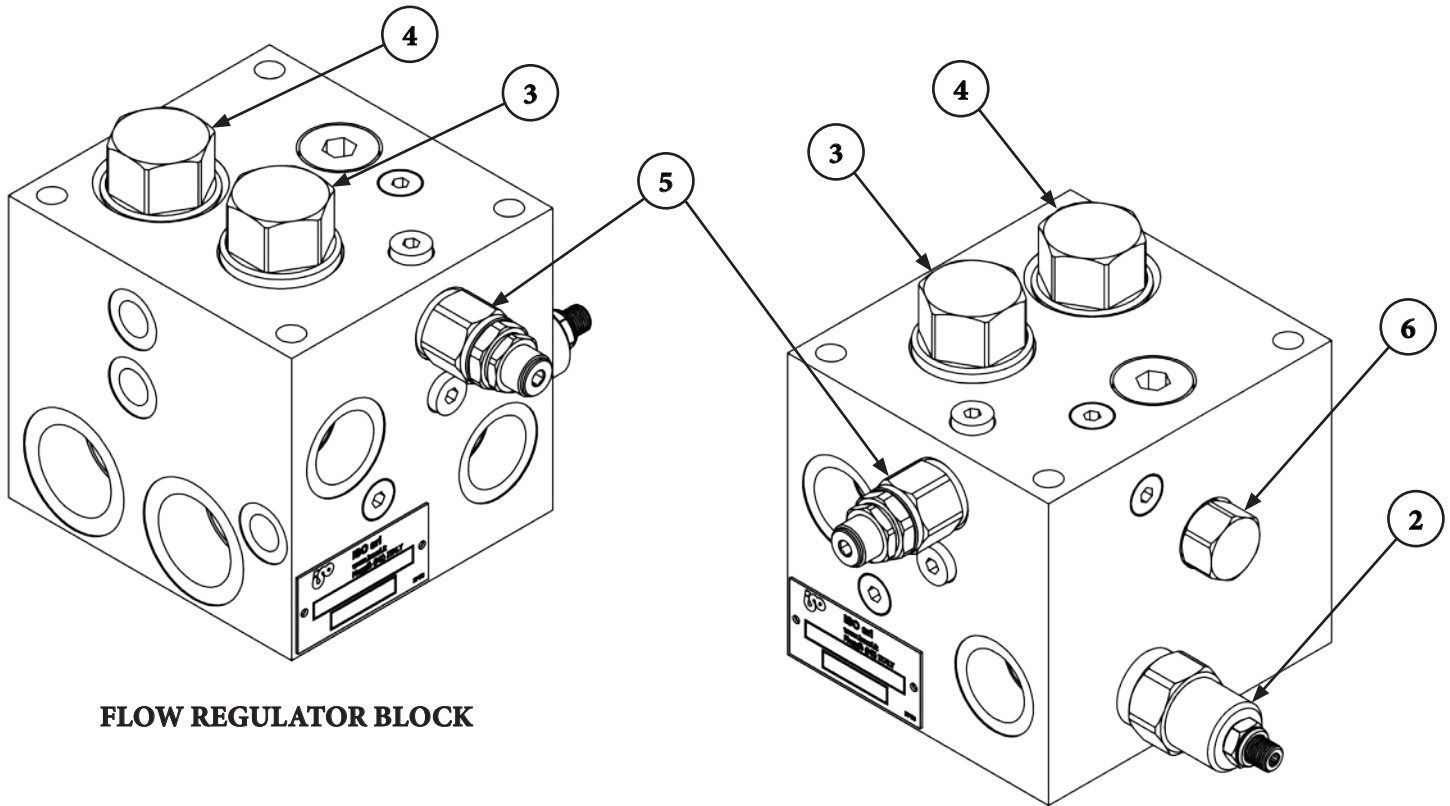
VALVE BLOCK REPLACEMENT PROCEDURE

If, after carrying out the valve block cleaning procedures, the functions are still in deficit, or if the valve block has a visible mechanical breakage that compromises the regular operation; carry out points 1 and 2 of the cleaning procedure and replace the old valve block with the new one. Lastly, perform steps 6-7-8 of the cleaning procedure.



5. TROUBLESHOOTING - continued

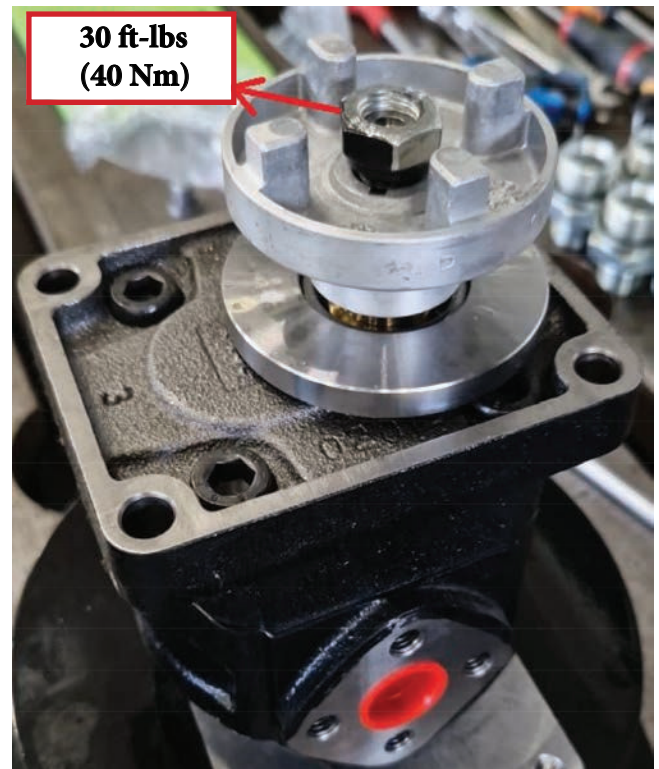
INSTALLATION TORQUE VALUES



FLOW REGULATOR BLOCK

INSTALLATION TORQUE

- ② **Flow Control Valve:** 45 ft-lbs (60 Nm)
- ③ **Logic Element Valve:** 125-140 ft-lbs (170-190 Nm)
- ④ **Check Valve:** 125-140 ft-lbs (170-190 Nm)
- ⑤ **Maximum Pressure Valve:** 45 ft-lbs (60 Nm)
- ⑥ **Check Valve:** 30 ft/lbs (40 Nm)



HYDRAULIC MOTOR AND ELASTIC JOINT

5. TROUBLESHOOTING - continued

IMPORTANT: the valve block is supplied already calibrated according to the magnet model as per parameters indicated in table 2.1.2.

For any calibrations and/or malfunctions of the oil flow and/or flow rate, contact the CWT technicians.

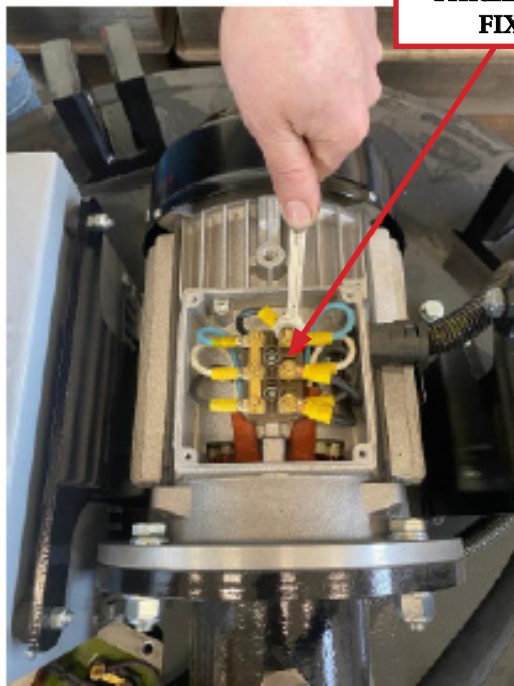
Do not independently adjust the valve block.

5.3.4 Electrical generator replacement

PROCEDURE

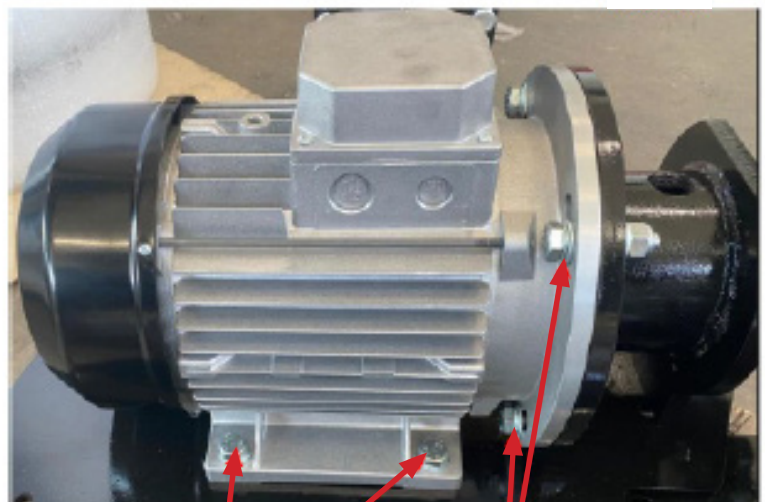
1. Disconnect the electrical cables (from the electronic control unit) from the terminals of the three-phase generator (fig. 4.8) (3 cables for the three phases).
2. Unscrew the generator fixing screws from the component's holder plate.
3. Unscrew the fixing screws of the motor-generator coupling flange to the component holder plate.
4. Unscrew the generator fixing screws from the motor-generator coupling flange.
5. Extract the generator complete with elastic semi-joint.
6. Remove the elastic semi-coupling from the generator shaft and mount it on the shaft of the new generator.
7. Fix, with the appropriate screws, the new generator to the motor-generator coupling flange.
8. Fix the motor-generator coupling flange and the generator to the component holder plate with the appropriate screws.
9. Connect the cables from the control electronics to the generator terminals.
10. Proceed to check the general operation.

FIGURE 4.8



THREE-PHASE GENERATOR
FIXING TERMINALS

FIGURE 4.9



THREE-PHASE GENERATOR FIXING
SCREWS ON COMPONENT'S HOLDER
PLATE

THREE-PHASE GENERATOR
FIXING SCREWS ON MOTOR
GENERATOR COUPLING
FLANGE

5. TROUBLESHOOTING - continued

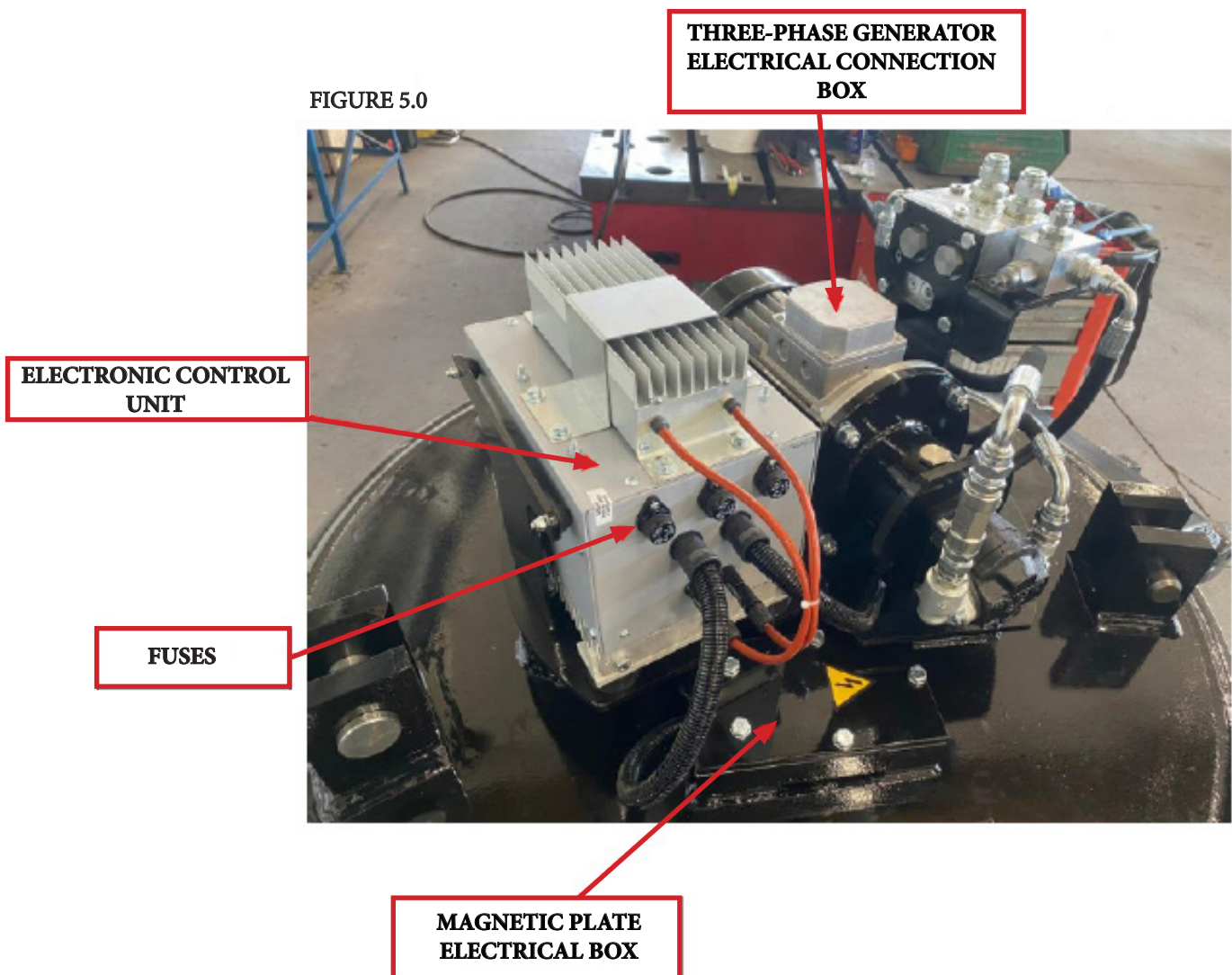
5.3.5 Electronic control replacement

ATTENTION: THE ELECTRONIC CONTROL UNIT CANNOT BE REPAIRED BY ANYONE
THE ELECTRONIC CONTROL UNIT WAS DESIGNED TO BE REPLACED ONLY AS A WHOLE.

REPLACEMENT PROCEDURE (FIG.5.0):

1. Disconnect the power cables in the electrical box of the magnetic plate.
2. Disconnect the power cables in the three-phase generator box.
3. Unscrew the screws securing the electronics on the component's holder plate.
4. Install the new electronics by fixing it with the fixing screws.
5. Connect the cables to the magnetic plate box.
6. Connect the cables to the three-phase generator box.
7. Proceed to check the general operation.

FIGURE 5.0



5. TROUBLESHOOTING - continued

5.4 Spare parts

The magnets are designed and constructed in such a way that they do not normally require spare parts, if used correctly and if correct maintenance is performed on them as described in this manual.

The attached parts diagram lists the parts subject to normal wear and tear as well as the components that can be replaced in the event of damage and/or malfunction. For continuity of operation it is advisable to have these spare parts available.



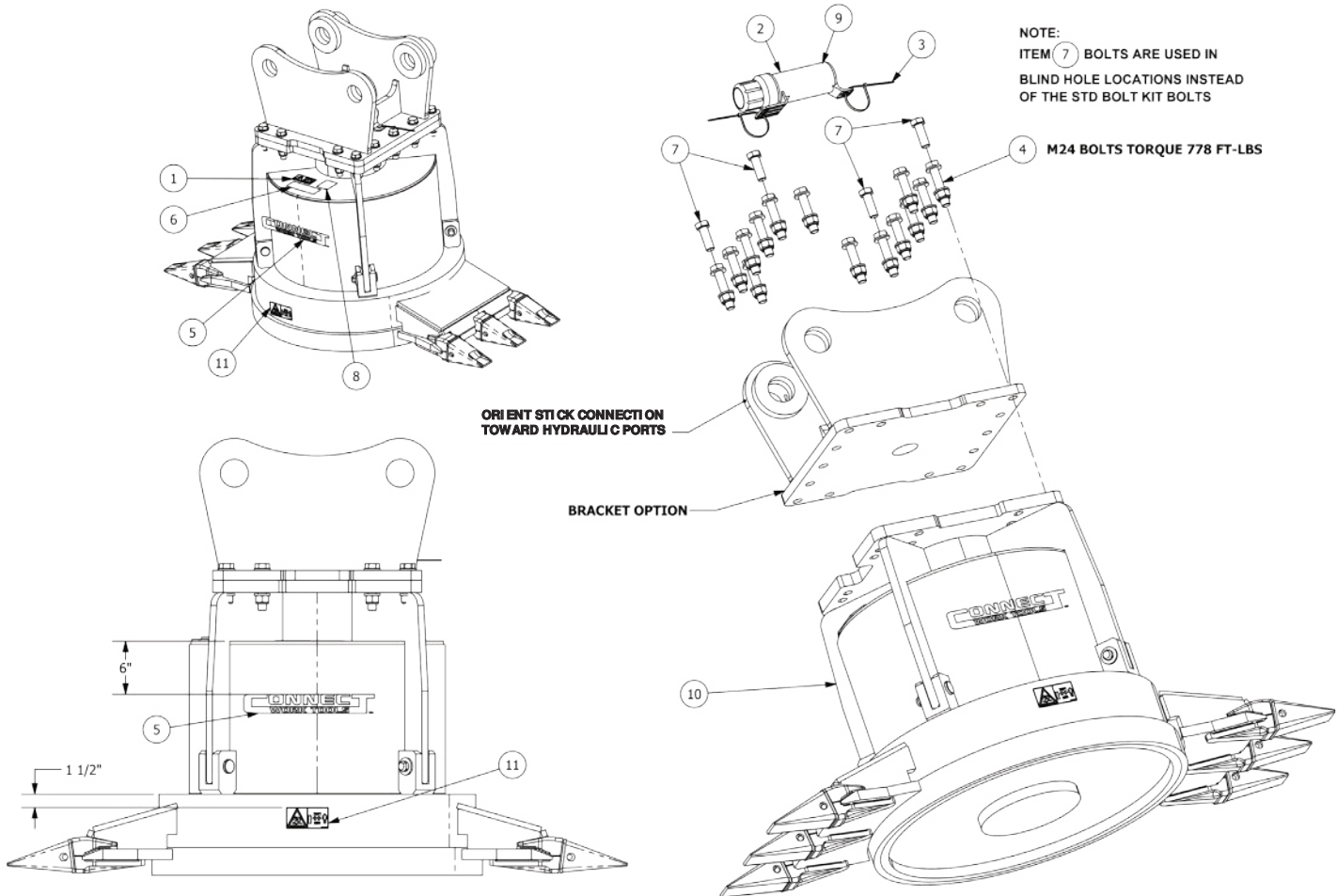
It is necessary to use only original spare parts; the use of non-original spare parts, in addition to voiding the warranty, can compromise the correct functioning of the system.



Connect Work Tools declines all responsibility for damage to property and/or persons caused by insufficient maintenance.

CMG38ID - DIRECT MOUNT MAGNET ASSEMBLY

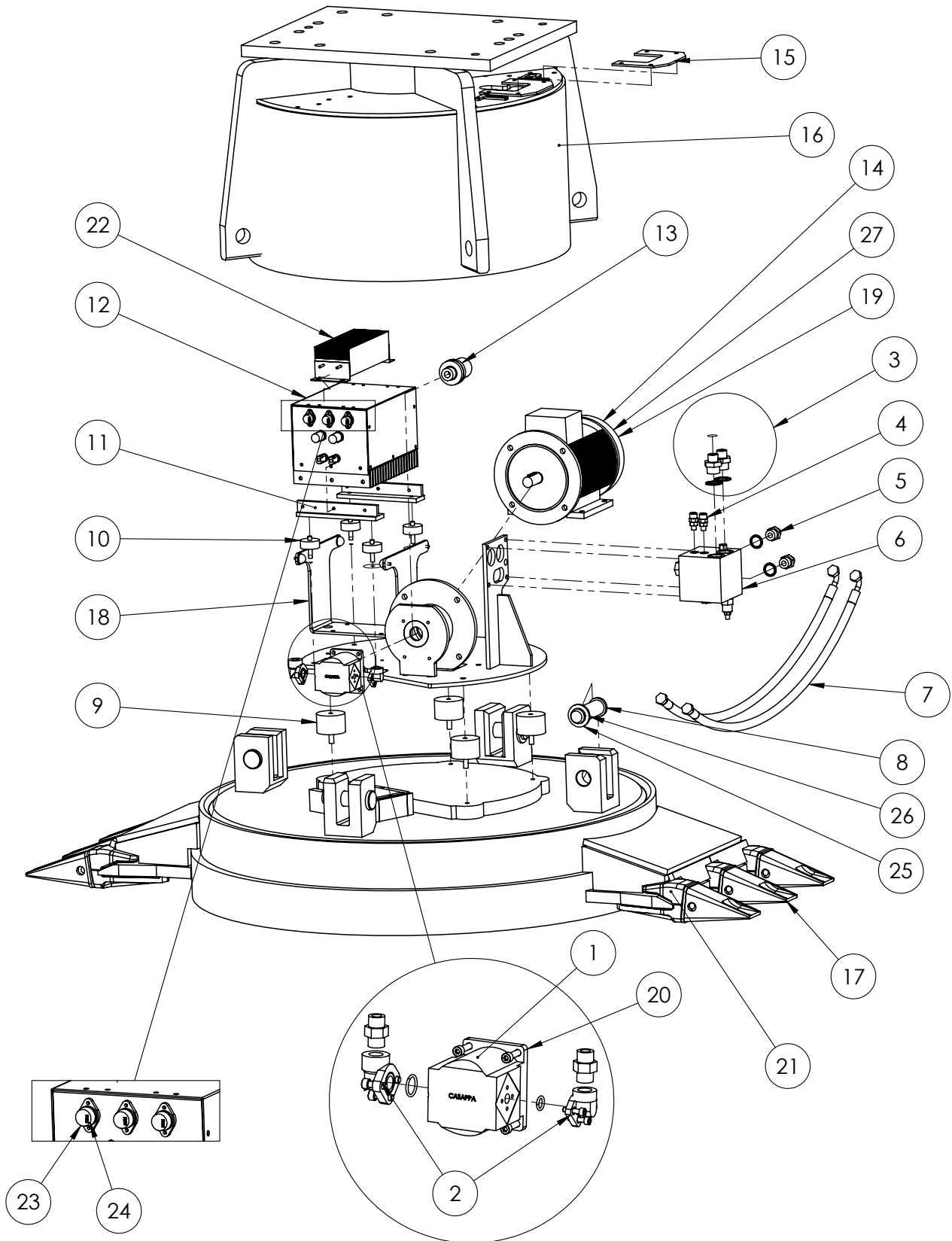
5.6. CMG38ID - DIRECT MOUNT MAGNET ASSEMBLY



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	16-00078	DECAL WARNING READ MANUAL
2	1	22-00549	DOCUMENT TUBE
3	2	30-00539	ZIP TIE 14" BLACK HD
4	1	CHB520BTPBK	MOUNTING BOLT KIT CH110/120/130/140
5	2	CHE00392	DECAL CONNECT LOGO 15"
6	1	CHE01864	DECAL CWT SERVICE-SALES-PARTS 2X6
7	4	CHHB2430070	HH CS M24 - 3.00 X 70_P 12.9 D933
8	1	CME00007	DECAL - MANUAL QR CODE OP & PARTS
9	1	CME00012	MANUAL PARTS AND OPS CMG SERIES MAGNETS
10	1	CMHMG-T-95	CMG38 HYD DM MAGNET W/TEETH
11	2	CWPE00007	DECAL WARNING SAFE DISTANCE 4.75 GENERAL

CMG38ID - DIRECT MOUNT MAGNET ASSEMBLY

5.6.1. CMHMG-T-95 SUBASSEMBLY

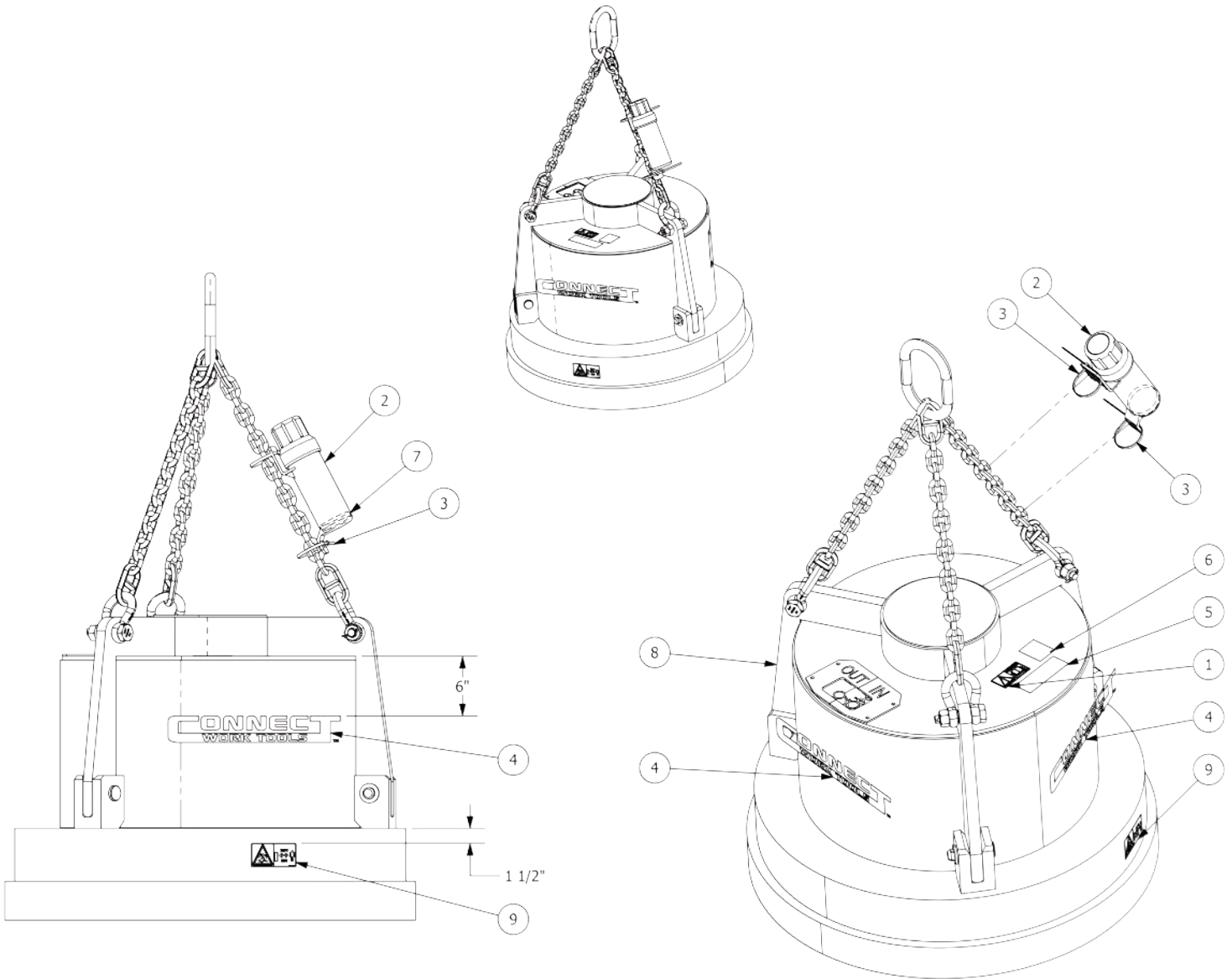


CMG38ID - DIRECT MOUNT MAGNET ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	CMCASC0000309	HYDRAULIC MOTOR FOR HMG 75-->125
2	1	CMGIDM0000310	FITTING SET HYDR MOTOR FOR HMG 75-->125
3	2	CMGIDM0000311	EXTRNL FITTING SET HYD VALVE HMG 75-->150
4	2	CMGIDM0000312	SET OF PRESS GAUGE CONNECT HMG 75-->150
5	2	CMGIDM0000313	INTRNL FITTING SET HYDR VLVE HMG 75-->150
6	1	CMGIDM0000314	HYDRAULIC VALVE FOR HMG 75-->125
7	1	CMFLUC0000315	HYDRAULIC HOSE FOR HMG 75-->125
8	1	CMGIDM0000369	COVER PIN FOR HMG 75-85-95
9	4	CMGIDM0000318	VIBR DAMPERS SET GENPACK HMG 75-->150
10	4	CMGIDM0000319	VIBR DAMPERS SET ELEC BOX HMG 75-->150
11	2	CMGIDM0000320	ELECTRONIC FIXING SET HMG 75-->150
12	1	CMGIDM0000328	ELECTR CNTRL BOX FOR HMG 75-85-95-105
13	1	CMFLUC0000322	ELASTIC JOINT FOR HMG 95-105-125
14	1	CMSOGC0000323	ELECTRGENERATOR SET FOR HMG 95-->125
15	1	CMGIDM0000874	HYDRAULIC CONNECTORS COVER FOR HMG 85-95
16	1	CMGIDM0000338	FIXED GUARD
17	1	CMGIDM0000317	TOOTH SET FOR HMG-T 85-->150
18	1	CMGIDM0000778	ANTI SHAKING KIT FOR HMG 85-->150
19	1	CMSOGC0000681	FAN FOR HMG 95-->150
20	1	CMFLUC0000841	HYDR MOTOR SEALING KIT FOR HMG 75-->125
21	1	CMGIDM0000866	TOOTH HOLDER
22	1	CMCALC0000840	ELECTRICAL RESISTOR FOR HMG 75-85-95-105
23	1	CMSIBC0000299	FUSE 25A FOR HMG 75-85-95-105
24	1	CMGIDM0000869	FUSE HOLDER FOR HMG 75-->125
25	1	CMGIDM0000872	COVER -PIN WASHER FOR HMG 75-85-95
26	1	CMGIDM0000873	COVER- PIN FORELOCK FOR HMG 75-85-95
27	1	CMSOGC0000865	FAN COVER FOR HMG 95-->150

CMG42IC - CHAIN MOUNT MAGNET ASSEMBLY

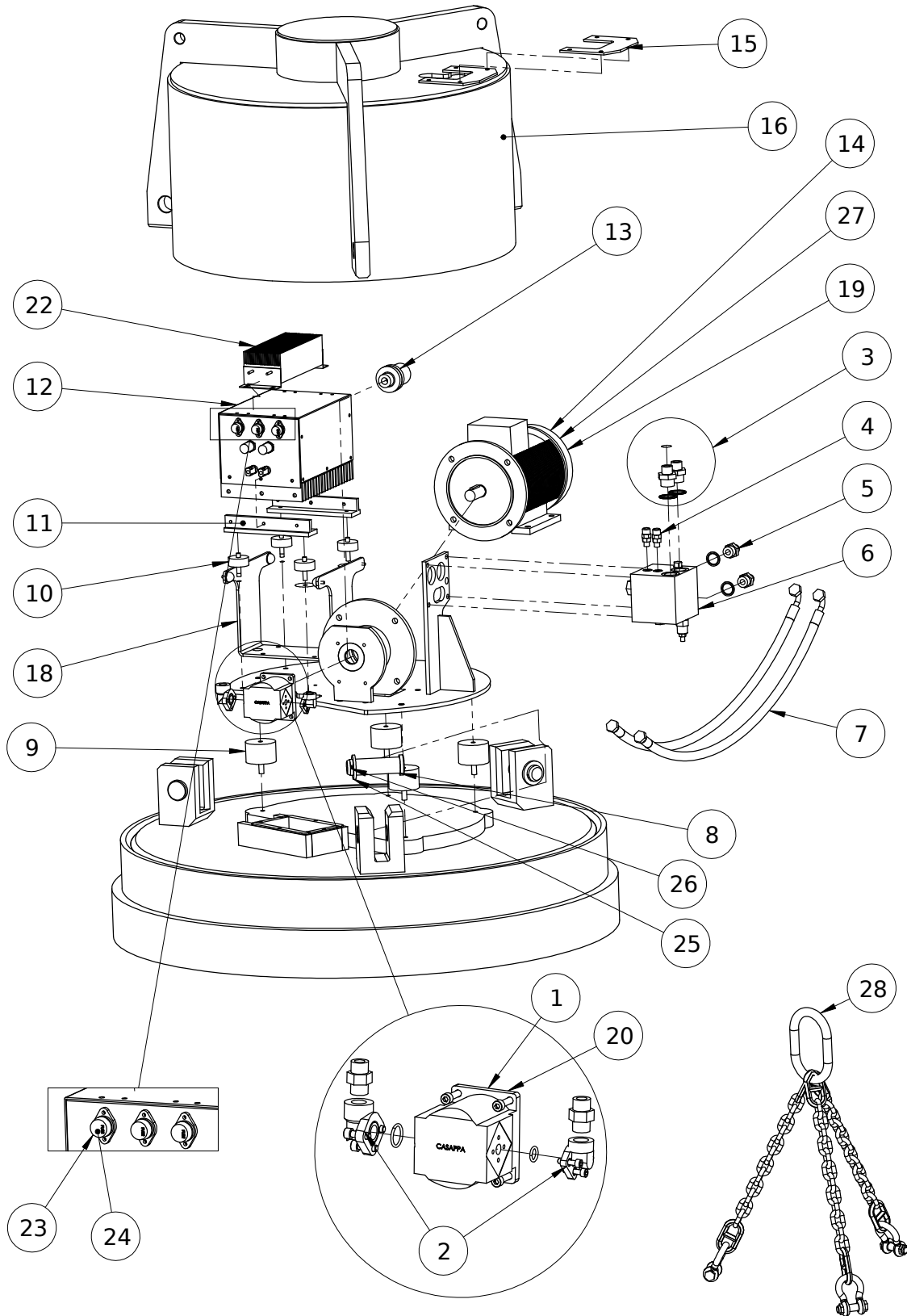
5.7. CMG42IC - CHAIN MOUNT MAGNET ASSEMBLY



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	16-00078	DECAL WARNING READ MANUAL
2	1	22-00549	DOCUMENT TUBE
3	2	30-00539	ZIP TIE 14" BLACK HD
4	2	CHE00109	DECAL CONNECT LOGO 18
5	1	CHE01864	DECAL CWT SERVICE-SALES-PARTS 2X6
6	1	CME00007	DECAL – MANUAL QR CODE OP & PARTS
7	1	CME00012	MANUAL PARTS AND OPS CMG SERIES MAGNETS
8	1	CMHMG-C-105	CMG42 HYD CHAIN MAGNET
9	2	CWPE00007	DECAL WARNING SAFE DISTANCE 4.75 GENERAL

CMG42IC - CHAIN MOUNT MAGNET ASSEMBLY

5.7.1. CMHMG-C-105 SUBASSEMBLY

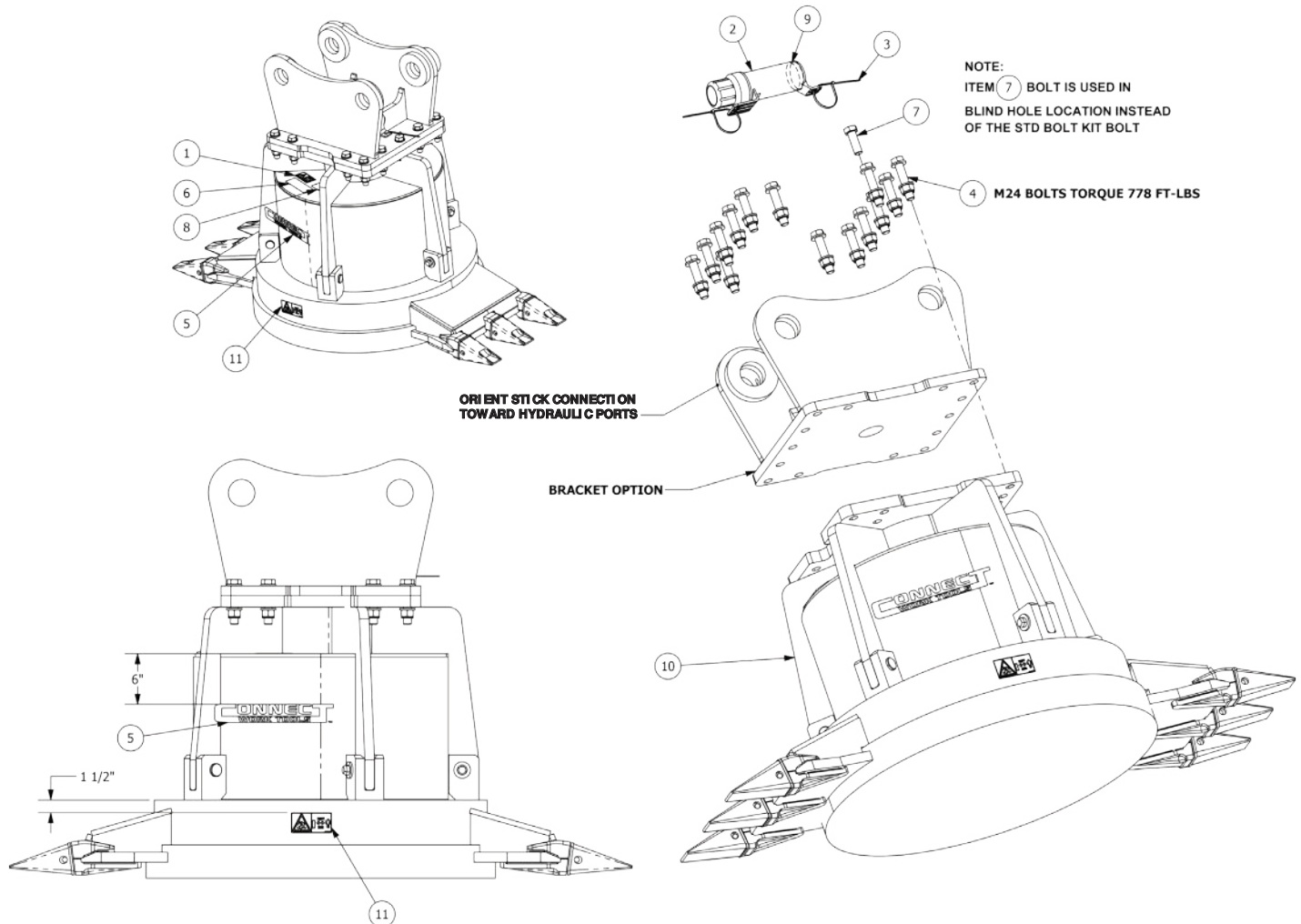


CMG42IC - CHAIN MOUNT MAGNET ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	CMCASC0000309	HYDRAULIC MOTOR FOR HMG 75-->125
2	1	CMGIDM0000310	FITTING SET HYDR MOTOR FOR HMG 75-->125
3	2	CMGIDM0000311	EXTRNL FITTINGSET HYD VALVE HMG 75-->150
4	2	CMGIDM0000312	SET OF PRESS GAUGE CONNECT HMG 75-->150
5	2	CMGIDM0000313	INTRNL FITTING SET HYDR VLVE HMG 75-->150
6	1	CMGIDM0000314	HYDRAULIC VALVE FOR HMG 75-->125
7	1	CMFLUC0000315	HYDRAULIC HOSE FOR HMG 75-->125
8	1	CMGIDM0000327	COVER PIN FOR HMG 105-115
9	4	CMGIDM0000318	VIBR DAMPERS SET GENPACK HMG 75-->150
10	4	CMGIDM0000319	VIBR DAMPERS SET ELEC BOX HMG 75-->150
11	2	CMGIDM0000320	ELECTRONIC FIXING SET HMG 75-->150
12	1	CMGIDM0000328	ELECTR CNTRL BOX FOR HMG 75-85-95-105
13	1	CMFLUC0000322	ELASTIC JOINT FOR HMG 95-105-125
14	1	CMSOGC0000323	ELECTRGENERATOR SET FOR HMG 95-->125
15	1	CMGIDM0000330	HYDR CONNECTORS COVER FOR HMG 105-115
16	1	CMGIDM0000334	FIXED GUARD
18	1	CMGIDM0000778	ANTI SHAKING KIT FOR HMG 85-->150
19	1	CMSOGC0000681	FAN FOR HMG 95-->150
20	1	CMFLUC0000841	HYDR MOTOR SEALING KIT FOR HMG 75-->125
22	1	CMCALC0000840	ELECTRICAL RESISTOR FOR HMG 75-85-95-105
23	1	CMSIBC0000299	FUSE 25A FOR HMG 75-85-95-105
24	1	CMGIDM0000869	FUSE HOLDER FOR HMG 75-->125
25	1	CMGIDM0000867	COVER -PIN WASHER FOR HMG 105-115
26	1	CMGIDM0000868	COVER- PIN FORELOCK FOR HMG 105-115
27	1	CMSOGC0000865	FAN COVER FOR HMG 95-->150
28	1	CMGIDM0000335	CHAIN FOR HMG 105-115 C

CMG42ID - DIRECT MOUNT MAGNET ASSEMBLY

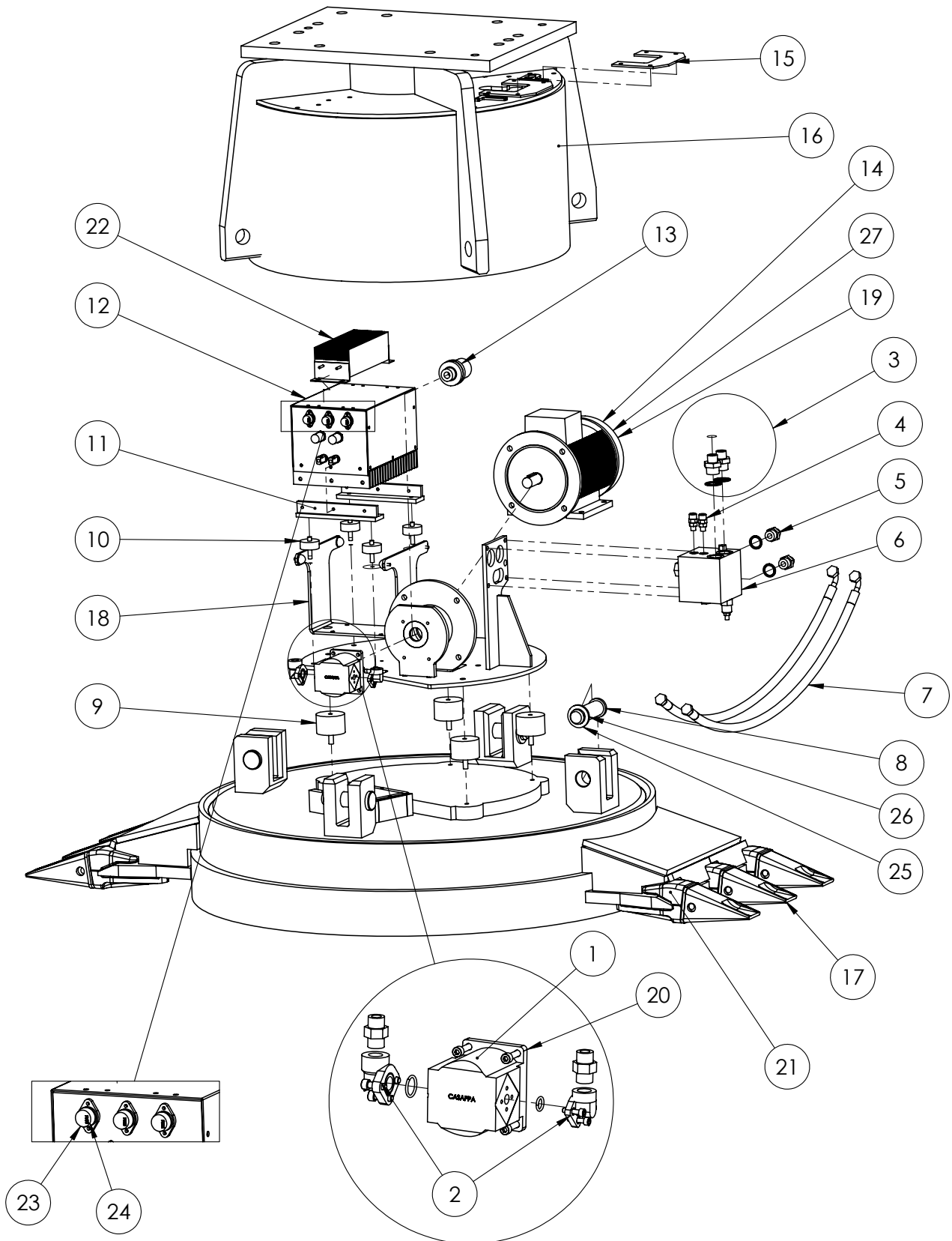
5.8. CMG42ID - DIRECT MOUNT MAGNET ASSEMBLY



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	16-00078	DECAL WARNING READ MANUAL
2	1	22-00549	DOCUMENT TUBE
3	2	30-00539	ZIP TIE 14" BLACK HD
4	1	CHB520BTPBK	MOUNTING BOLT KIT CH110/120/130/140
5	2	CHE00392	DECAL CONNECT LOGO 15"
6	1	CHE01864	DECAL CWT SERVICE-SALES-PARTS 2X6
7	3	CHHB2430070	HH CS M24 - 3.00 X 70_P 12.9 D933
8	1	CME00007	DECAL - MANUAL QR CODE OP & PARTS
9	1	CME00012	MANUAL PARTS AND OPS CMG SERIES MAGNETS
10	1	CMHMG-T-105	CMG42 HYD DM MAGNET W/TEETH
11	2	CWPE00007	DECAL WARNING SAFE DISTANCE 4.75 GENERAL

CMG42ID - DIRECT MOUNT MAGNET ASSEMBLY

5.8.1. CMHMG-T-105 SUBASSEMBLY

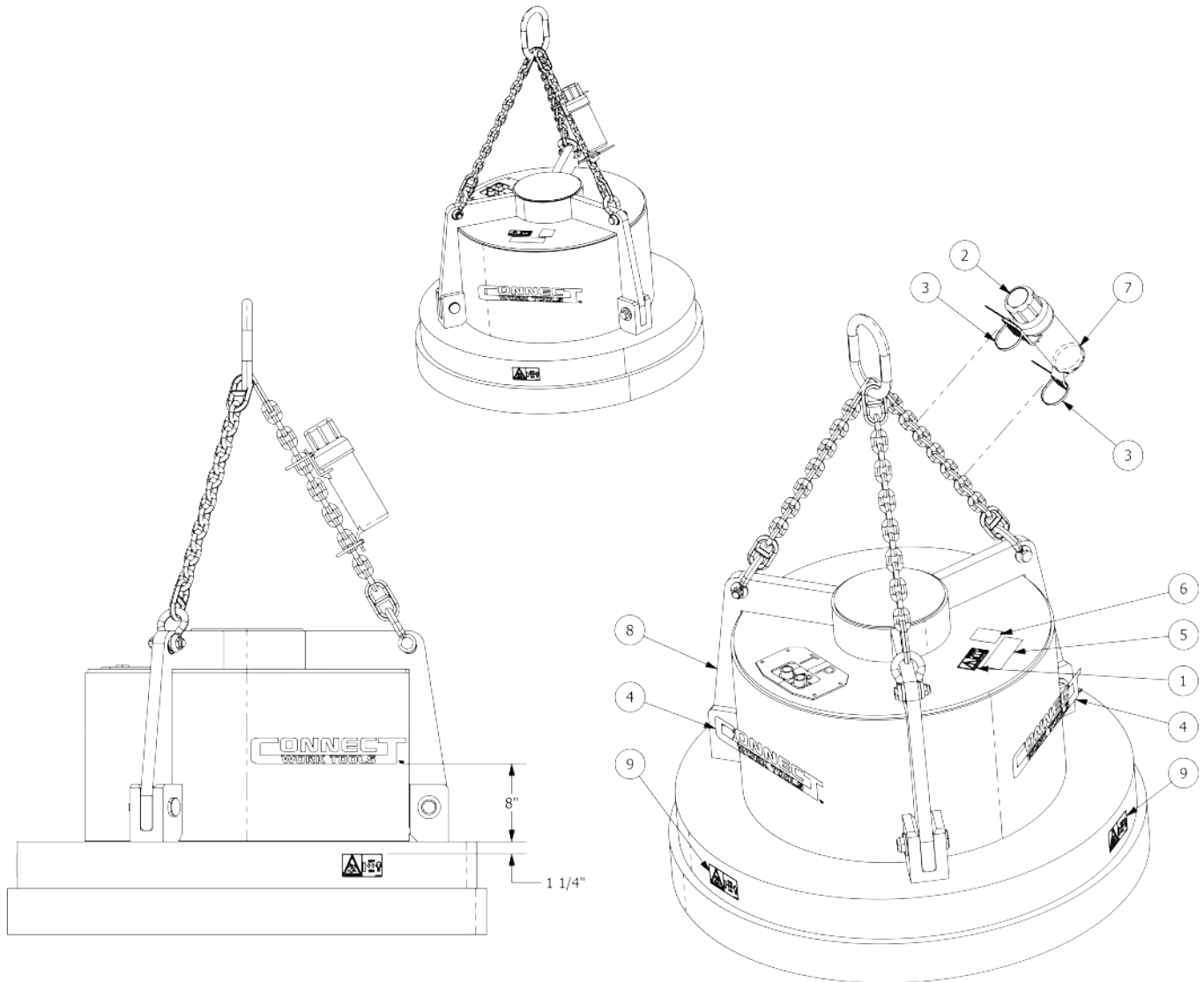


CMG42ID - DIRECT MOUNT MAGNET ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	CMCASC0000309	HYDRAULIC MOTOR FOR HMG 75-->125
2	1	CMGIDM0000310	FITTING SET HYDR MOTOR FOR HMG 75-->125
3	2	CMGIDM0000311	EXTRNL FITTINGSET HYD VALVE HMG 75-->150
4	2	CMGIDM0000312	SET OF PRESS GAUGE CONNECT HMG 75-->150
5	2	CMGIDM0000313	INTRNL FITTNG SET HYDR VLVE HMG 75-->150
6	1	CMGIDM0000314	HYDRAULIC VALVE FOR HMG 75-->125
7	1	CMFLUC0000315	HYDRAULIC HOSE FOR HMG 75-->125
8	1	CMGIDM0000327	COVER PIN FOR HMG 105-115
9	4	CMGIDM0000318	VIBR DAMPERS SET GENPACK HMG 75-->150
10	4	CMGIDM0000319	VIBR DAMPERS SET ELEC BOX HMG 75-->150
11	2	CMGIDM0000320	ELECTRONIC FIXING SET HMG 75-->150
12	1	CMGIDM0000328	ELECTR CNTRL BOX FOR HMG 75-85-95-105
13	1	CMFLUC0000322	ELASTIC JOINT FOR HMG 95-105-125
14	1	CMSOGC0000323	ELECTRGENERATOR SET FOR HMG 95-->125
15	1	CMGIDM0000330	HYDR CONNECTORS COVER FOR HMG 105-115
16	1	CMGIDM0000329	FIXED GUARD
17	1	CMGIDM0000317	TOOTH SET FOR HMG-T 85-->150
18	1	CMGIDM0000778	ANTI SHAKING KIT FOR HMG 85-->150
19	1	CMSOGC0000681	FAN FOR HMG 95-->150
20	1	CMFLUC0000841	HYDR MOTOR SEALING KIT FOR HMG 75-->125
21	1	CMGIDM0000866	TOOTH HOLDER
22	1	CMCALC0000840	ELECTRICAL RESISTOR FOR HMG 75-85-95-105
23	1	CMSIBC0000299	FUSE 25A FOR HMG 75-85-95-105
24	1	CMGIDM0000869	FUSE HOLDER FOR HMG 75-->125
25	1	CMGIDM0000867	COVER -PIN WASHER FOR HMG 105-115
26	1	CMGIDM0000868	COVER- PIN FORELOCK FOR HMG 105-115
27	1	CMSOGC0000865	FAN COVER FOR HMG 95-->150

CMG50IC - CHAIN MOUNT MAGNET ASSEMBLY

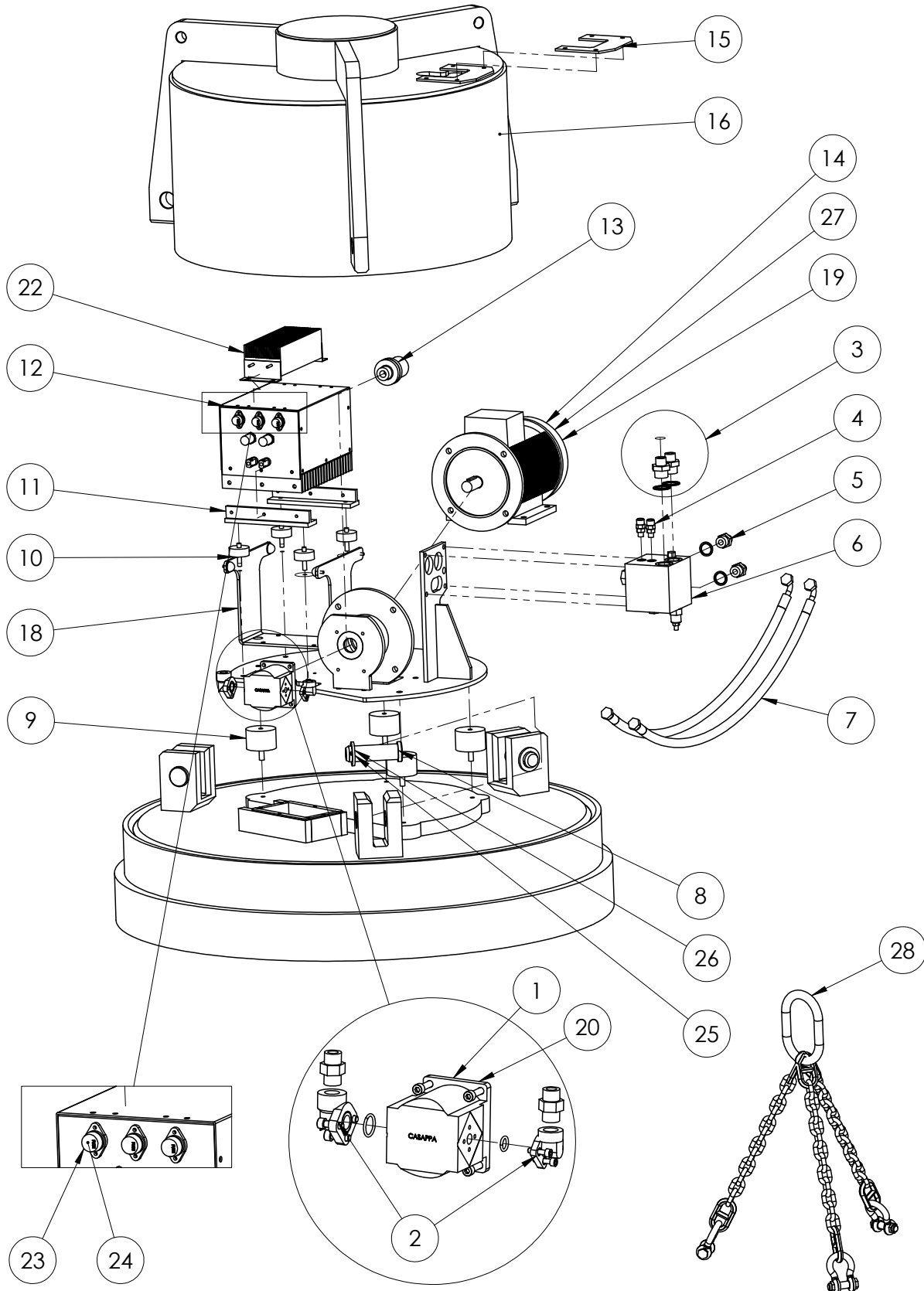
5.9. CMG50IC - CHAIN MOUNT MAGNET ASSEMBLY



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	16-00078	DECAL WARNING READ MANUAL
2	1	22-00549	DOCUMENT TUBE
3	2	30-00539	ZIP TIE 14" BLACK HD
4	2	CHE00109	DECAL CONNECT LOGO 18
5	1	CHE01864	DECAL CWT SERVICE-SALES-PARTS 2X6
6	1	CME00007	DECAL – MANUAL QR CODE OP & PARTS
7	1	CME00012	MANUAL PARTS AND OPS CMG SERIES MAGNETS
8	1	CMHMG-C-125	CMG50 HYD CHAIN MAGNET
9	2	CWPE00007	DECAL WARNING SAFE DISTANCE 4.75 GENERAL

CMG50IC - CHAIN MOUNT MAGNET ASSEMBLY

5.9.1. CMHMG-C-125 SUBASSEMBLY

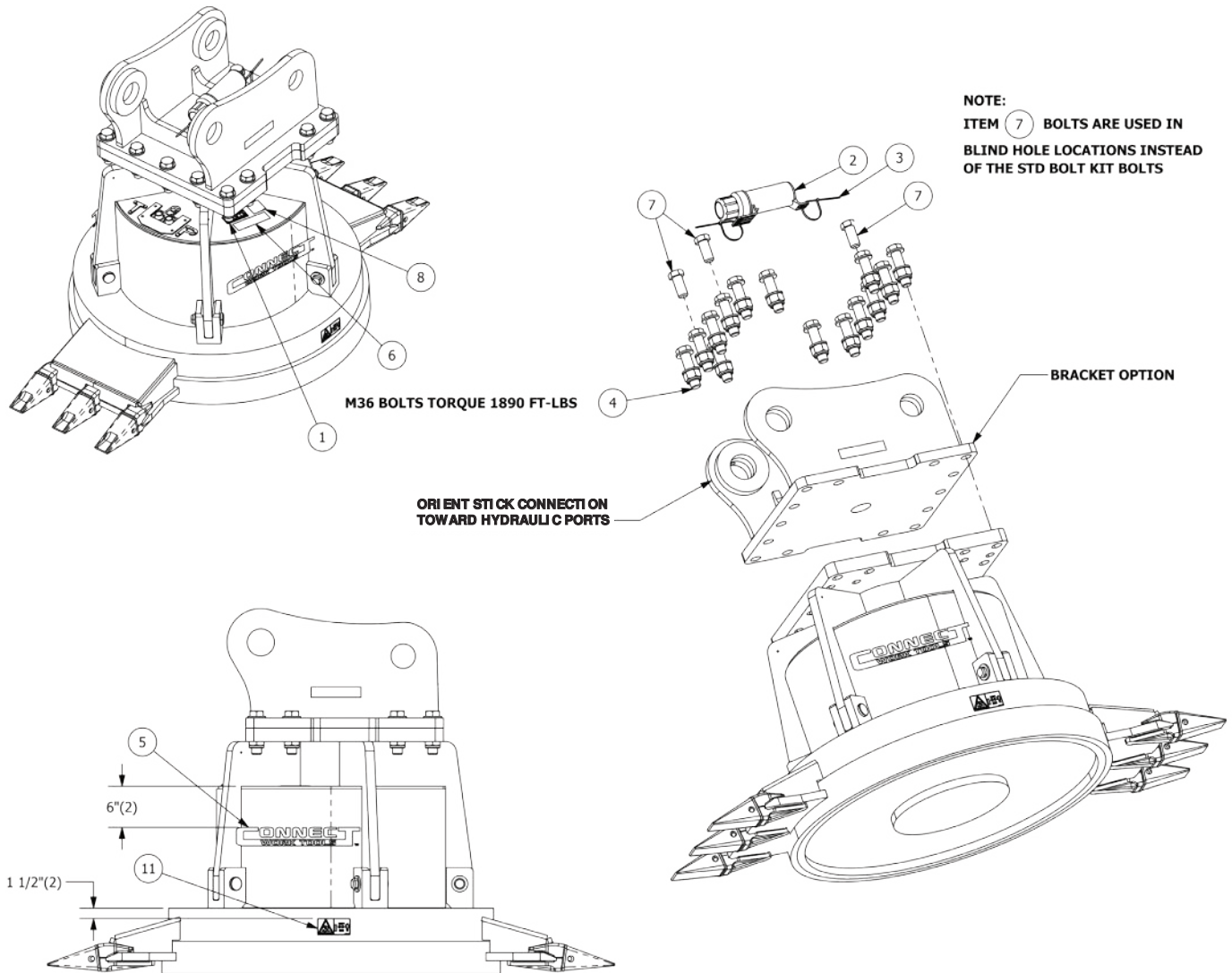


CMG50IC - CHAIN MOUNT MAGNET ASSEMBLY

NO	QTY	PART NO.	PART NAME
1	1	CMCASC0000309	HYDRAULIC MOTOR FOR HMG 75-->125
2	1	CMGIDM0000310	FITTING SET HYDR MOTOR FOR HMG 75-->125
3	2	CMGIDM0000311	EXTRNL FITTINGSET HYD VALVE HMG 75-->150
4	2	CMGIDM0000312	SET OF PRESS GAUGE CONNECT HMG 75-->150
5	2	CMGIDM0000313	INTRNL FITTING SET HYDR VLVE HMG 75-->150
6	1	CMGIDM0000314	HYDRAULIC VALVE FOR HMG 75-->125
7	1	CMFLUC0000315	HYDRAULIC HOSE FOR HMG 75-->125
8	1	CMGIDM0000316	COVER PIN FOR HMG 125-150
9	4	CMGIDM0000318	VIBR DAMPERS SET GENPACK HMG 75-->150
10	4	CMGIDM0000319	VIBR DAMPERS SET ELEC BOX HMG 75-->150
11	2	CMGIDM0000320	ELECTRONIC FIXING SET HMG 75-->150
12	1	CMGIDM0000321	ELECTRONIC CONTROL BOX FOR HMG 115-125
13	1	CMFLUC0000322	ELASTIC JOINT FOR HMG 95-105-125
14	1	CMSOGC0000323	ELECTRGENERATOR SET FOR HMG 95-->125
15	1	CMGIDM0000324	HYDRCONNECTORS COVER FOR HMG 125-150
16	1	CMGIDM0000325	FIXED GUARD FOR HMG 125
18	4	CMGIDM0000778	ANTI SHAKING KIT FOR HMG 85-->150
19	1	CMSOGC0000681	FAN FOR HMG 95-->150
20	1	CMFLUC0000841	HYDR MOTOR SEALING KIT FOR HMG 75-->125
22	1	CMCALC0000839	ELECTRICAL RESISTOR FOR HMG 115-125-150
23	1	CMSIBC0000300	FUSE 30A FOR HMG 115-125 FAST BLOW
24	1	CMGIDM0000869	FUSE HOLDER FOR HMG 75-->125
25	1	CMGIDM0000870	COVER -PIN WASHER FOR HMG 125-150
26	1	CMGIDM0000871	COVER- PIN FORELOCK FOR HMG 125-150
27	1	CMSOGC0000865	FAN COVER FOR HMG 95-->150
28	1	CMGIDM0000337	CHAIN FOR HMG 75-85-95-125 C

CMG50ID - DIRECT MOUNT MAGNET ASSEMBLY

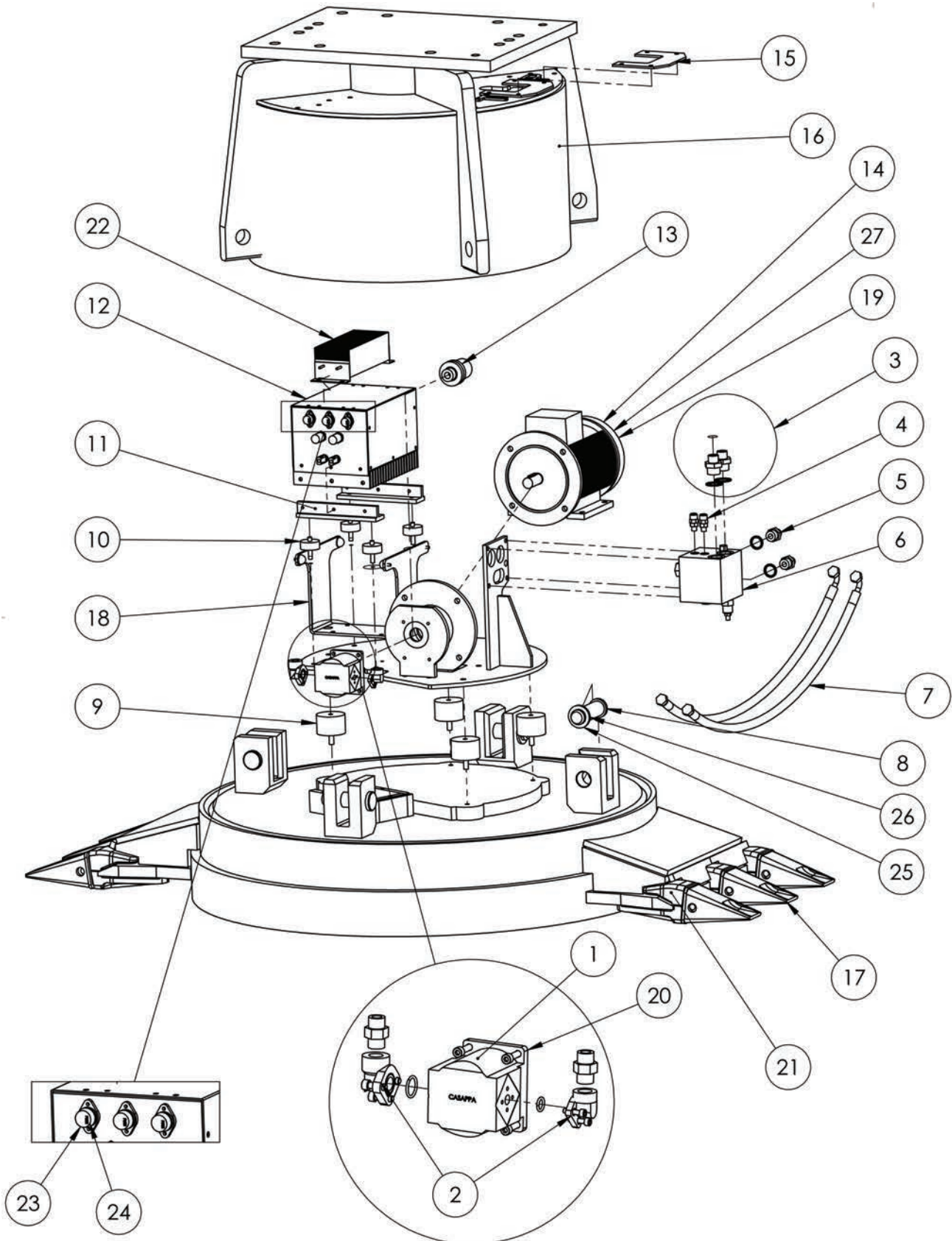
5.10. CMG50ID - DIRECT MOUNT MAGNET ASSEMBLY



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	16-00078	DECAL WARNING READ MANUAL
2	1	22-00549	DOCUMENT TUBE
3	2	30-00539	ZIP TIE 14" BLACK HD
4	1	CHD035BTPBK	MOUNTING BOLT KIT CH165
5	2	CHE00109	DECAL CONNECT LOGO 18
6	1	CHE01864	DECAL CWT SERVICE-SALES-PARTS 2X6
7	3	CHHB3640080	HH CS M36 - 4.00 X 80 P_10.9 D933
8	1	CME00007	DECAL - MANUAL QR CODE OP & PARTS
9	1	CME00012	MANUAL PARTS AND OPS CMG SERIES MAGNETS
10	1	CMHMG-T-125	CMG50 HYD DM MAGNET W/TEETH
11	2	CWPE00007	DECAL WARNING SAFE DISTANCE 4.75 GENERAL

CMG50ID - DIRECT MOUNT MAGNET ASSEMBLY

5.10.1. CMHMG-T-125 SUBASSEMBLY



CMG50ID - DIRECT MOUNT MAGNET ASSEMBLY

NO	QTY	PART NO.	PART NAME
1	1	CMCASC0000309	HYDRAULIC MOTOR FOR HMG 75-->125
2	1	CMGIDM0000310	FITTING SET HYDR MOTOR FOR HMG 75-->125
3	2	CMGIDM0000311	EXTRNL FITTINGSET HYD VALVE HMG 75-->150
4	2	CMGIDM0000312	SET OF PRESS GAUGE CONNECT HMG 75-->150
5	2	CMGIDM0000313	INTRNL FITTING SET HYDR VLVE HMG 75-->150
6	1	CMGIDM0000314	HYDRAULIC VALVE FOR HMG 75-->125
7	1	CMFLUC0000315	HYDRAULIC HOSE FOR HMG 75-->125
8	1	CMGIDM0000316	COVER PIN FOR HMG 125-150
9	4	CMGIDM0000318	VIBR DAMPERS SET GENPACK HMG 75-->150
10	4	CMGIDM0000319	VIBR DAMPERS SET ELEC BOX HMG 75-->150
11	2	CMGIDM0000320	ELECTRONIC FIXING SET HMG 75-->150
12	1	CMGIDM0000321	ELECTRONIC CONTROL BOX FOR HMG 115-125
13	1	CMFLUC0000322	ELASTIC JOINT FOR HMG 95-105-125
14	1	CMSOGC0000323	ELECTRGENERATOR SET FOR HMG 95-->125
15	1	CMGIDM0000324	HYDRCONNECTORS COVER FOR HMG 125-150
16	1	CMGIDM0000325	FIXED GUARD FOR HMG 125
17	1	CMGIDM0000317	TOOTH SET FOR HMG-T 85-->150
18	4	CMGIDM0000778	ANTI SHAKING KIT FOR HMG 85-->150
19	1	CMSOGC0000681	FAN FOR HMG 95-->150
20	1	CMFLUC0000841	HYDR MOTOR SEALING KIT FOR HMG 75-->125
21	1	CMGIDM0000866	TOOTH SET FOR HMG-T 85-->150
22	1	CMCALC0000839	ELECTRICAL RESISTOR FOR HMG 115-125-150
23	1	CMSIBC0000300	FUSE 30A FOR HMG 115-125 FAST BLOW
24	1	CMGIDM0000869	FUSE HOLDER FOR HMG 75-->125
25	1	CMGIDM0000870	COVER -PIN WASHER FOR HMG 125-150
26	1	CMGIDM0000871	COVER- PIN FORELOCK FOR HMG 125-150
27	1	CMSOGC0000865	FAN COVER FOR HMG 95-->150

CONNECTTM
WORK TOOLS

920.238.6657

www.connectworktools.com

