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INSTRUCTION MANUAL
AND
PARTS CATALOGUE
FOR

MDE SCORPION
EXCAVATOR GRABS

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CONTENT

EU CERTIFICATE OF CONFORMITY

CONFORMING TO EC Machinery Directive 2006/42 EC

We:

MDE Machinery

110 Seagahan Road

Collone

Co. Armagh

BT60 2BJ

declare in sole responsibility, that the products

Type: SCORPION EXCAVATOR GRABS

to which this certificate applies, conforms to the basic safety

and health requirements of the EC Machinery Directive 2006/42 EC,

and the Transposed Harmonised Standards:

BS EN 1553 (2000)

Mark Belford

Managing Director

SAFETY INSTRUCTIONS

IMPORTANT - READ BEFORE USE

This manual is provided to assist you in getting the best results from your machine and ensure that you do so safely. If you have any queries about the use of the machine contact your dealer before use. Please keep this manual for future reference.

INTENDED USE

The intended use of a Scorpion Excavator Grab is to pick up, move, and handle various materials. While also having the unique ability to be used as a rake for loose material such as soil.

FUNDAMENTAL PRECAUTIONS

On delivery, your dealer gave you an explanation of the operation and maintenance of this MDE Scorpion Excavator Grab. Please read and understand these operating instructions before operating the machine for the first time. It is essential that you observe all safety instructions.

Incorrect use or mishandling of the machine can endanger:
Life and Limb of the operator, other persons or animals within the vicinity of the machine.
The machine and other material assets of the owner or third persons.
The performance of the machine.

Anyone who is involved in the commissioning, operation or maintenance of the Excavator Grab must read and understand these instructions very carefully and observe them at all times.

NEVER DISTRACT ANYONE WHO IS USING A MACHINE.

AUTHORISED OPERATORS

Youths under the age of 16 must not operate this implement. The owner of the machine must provide the operator with the operating instructions and make sure they have read and understood them. Only then may the machine be put into operation.

The owner must ensure that only authorised persons operate/work on this machine. He is responsible for keeping any third persons or animals out of the working area of the machine.

THE OPERATOR MUST BE FULLY TRAINED BEFORE USING THE IMPLEMENT. A SAFE DISTANCE OF AT LEAST 50M MUST BE OBSERVED BY ANYONE WITHIN THE VICINITY OF THE SCORPION EXCAVATOR GRAB.

GENERAL SAFETY AND ACCIDENT PREVENTION REGULATIONS

Ensure the implement is correctly and securely attached to the operating vehicle. Only use genuine MDE pins.

Always use the correct mounting bracket and ensure that it is fitted by a trained and competent operator who has been approved by your MDE dealer. It is recommended to use an MDE interface plate for optimum performance.

NEVER attach to a excavator which would be rendered unstable when the implement is operated at its full capacity. Take note of the maximum load permissible on excavator.

Take extra care when operating machinery on sloping ground. NEVER operate on ground where there is a risk of the tractor becoming unstable.

When the unit is stationary always ensure it is lowered to the ground.

When detaching the implement from the excavator always ensure that it is stable and safely positioned on a level surface.

The attaching and detaching of the implement must be carried out by only one operator.

There should not be any other people in the vicinity of the implement or in the excavator.

Before operation make yourself familiar with all elements and controls of the machine as well as their functions.

Before operation inspect the area around you. Keep children away. All visitors and unauthorised persons should be kept well away from work area at all times.

Under NO circumstances should anyone, authorised or otherwise attempt to use the grab as a means of personal transport. It is designed as a specialist purpose excavator grab implement and is unsuitable for the safe transportation of passengers. NEVER allow anyone especially children to travel anywhere between the excavator and implement.

Any attempt to overload the machine will risk life and limb of the operator and immediately invalidate warranty.

To avoid personal injury keep hands and limbs well away from the moving parts.

ENSURE that the operator is aware of the overhang when the implement is mounted on the front of the excavator.

Always keep the grab and load as low as possible to maximise stability.

NEVER attempt to move the implement manually.

During overhead work, fragments or blocks of material can fall. Make sure that the machine on which the attachment is installed has the necessary protections for performing this type of work and has an FOPS cabin (Fig. 2.2.1). Base machine (excavator). Should have appropriate guarding/armoured glass. It is mandatory to check that all safety devices of operating machine must be activated.

Use the appropriate individual protection devices (gloves, goggles, hard hat, and safety shoes) during both work and maintenance.

Do not use the attachment if it is not working properly.

The unloading of material always should be parallel and near to the ground.

Pay attention to put the trees on ground in safety condition.

Never perform hasty or makeshift repairs that could compromise the good operation of the attachment. In the case of doubt, always request service by specialised personnel.

It is forbidden to perform checks and/or replace parts during work. Unless expressly specified by this manual, avoid repairing or adjusting the attachment (or parts of it) during work, in order to avoid being hooked by moving parts.

The attachment can only be used after checking alignment with all specification of the operating machine, particularly the stability, and properly installed.

The operator, before leaving the operating machine control, must stop the attachment in safety condition.

The arm must be moved safely, with controlled movements.

Do not bring the operating machine closer than 20 meters from aerial power lines under voltage.

Do not make any adaptations or changes that the manufacturer has not previously agreed to and approved in writing.

Do not operate under the attachment if not safety supported.

Do not operate with the attachment and operating machine on closed area without proper ventilation.

The operator never use drugs or alcohol.

Only allowed to use the attachment when there are: properly ambient condition (enough light; low wind; without snow load), stable ground, operating area is totally free and guaranteed the operator visibility from the machine.

Do not remove safety devices or protective guards.

It is absolutely prohibited for anyone to use the attachment for any purpose other than that expressly allowed and documented. The attachment must always be used in the manner and at the times and places required by good practice and in conformity with the current laws of every country, even if there are no laws regulating the sector in the country of use.

PUTTING INTO OPERATION

Warn persons in its vicinity that the attachment is going into operation.

Check all the safety systems.

Check the protections and signage. Before putting the attachment in operation, it is necessary to perform a series of checks and controls to prevent errors or accidents while putting it in operation. In case of problems, it's necessary to solve it immediately.

Check that the attachment has not been damaged during mounting;

Check the condition and tightening torque of related fixing bolts;

Carefully check the integrity of the hydraulic hoses, valves and various components;

Check that all moving parts are moving freely.

Check that the hydraulic connections are tight to prevent dangerous leaks.

In case of working on public area the end user must be check the correspondence of system (operating machine & attachment) to the local compliance.

OPERATING CYCLE FOR GRABBING

First of all check that the material to lift can be properly clamped onto and does not exceed the lifting capacity of operating machine. In order to avoid problems of instability operate with the load closer to the operating machine.

Activate all the safety devices provided on the operating machine checking the functionality.

Operate with slow movements and only after having reached full confidence with the attachment operating machine especially when working on sloping ground.

Reach with the operating machine the working area.

Make sure that nobody is in the range of action of the operating machine and attachment or, in any case, in the danger area.

Bring the attachment with arm open towards the object needing lifted. Check the proper alignment of the object with the vertical axis of the attachment, eventually adjust it with the articulations available for improving the grip.

Operate the hydraulic control of the main line to close the arm seizing the object. Arise in the condition that the load cannot reach the operating machine.

Check that the object is completed clamp into the grapple;

Now the grabbing cycle is completed it's necessary to start the dumping phase.

As first, fix store area for the material ensuring the necessary safety conditions without hindering the work area of the operating machine, for the subsequent phases of work that will follow.

With the articulation of the operating machine work equipment put the object in parallel to the ground.

Place the object as much as possible closer to the ground, ensuring the minimum distance for the articulation of the grapple, in order to avoid conditions of instability of the operating machine during the dumping phase.

STOP

First of all it is mandatory to put in place safety conditions before the attachment is stopped. The attachment is stopped by simply leaving the controls of the relative hydraulic distributors in their rest positions. Under normal conditions, if the controls are not activated, the attachment does not perform any movements. Before leaving the operating machine it is necessary to stop the engine.

TAKING OUT OF SERVICE

On the occasion of long periods of inactivity, it is necessary to close all articulations and then disconnect the hydraulic power from the attachment.

Check that all parts are intact, and all bolts are right tightening torque, in case of trouble it is necessary to repair.

Clean the attachment removing all residual material in order to avoid rust problem.

Spray a protective product on the attachment in order to avoid rust and seizure problems.

Grease all articulation.

Recover the attachment in safety condition; in covered area with low humidity..

WASTE DISPOSAL

The user is responsible for the correct disposal of the waste produced by the attachment in conformity with the current law in the country of use. Lubricants and replaced parts must be disposed of in conformity with the current law in the country of use of the attachment.

MAINTENANCE

As a rule, disengage the driving system and stop the engine prior to carrying out maintenance, servicing, cleaning or repair work. ALWAYS remove the ignition key.

Prop the machine with appropriate supports before carrying out any maintenance work. The manufacturer will not be responsible for any damages or injuries caused by unauthorised repair, alterations or mishandling of the product.

Maintain product with care. Check periodically for damage that would affect the safe operation of the implement.

Only use original MDE replacement parts to replace worn parts.

ALWAYS ensure all warning stickers are kept clean and in good condition.

Regularly check the bolts at the hinge points and tighten if necessary.

Regularly lubricate the hydraulic cylinder and hinges using clean grease.

Cover the chromed area of the hydraulic cylinder with a layer of grease during prolonged periods of inactivity.;

The maintenance required for this attachment is divided into:

1. Regular
2. Scheduled
3. Extraordinary

They include operations relative to lubrication, cleaning, adjustment, replacement, inspection, tightening, etc. In performing maintenance and/or repairs, it is a good idea to follow these recommendations:

Before beginning work, display a card, "ATTACHMENT BEING MAINTAINED" in a visible position;

Do not use solvents or inflammable materials;

Take care not to spill lubricants on the ambient;

When accessing parts of the attachment, use suitable means for the operations to be performed;

Do not operate under the attachment if not safety supported

When finished working, correctly replace and attach all the protections that were removed and/or opened;

Carefully clean individual components with an appropriate degreaser and without using compressed air (which just moves dirt around);

Determine the frequency of maintenance based on the specific need in relation to the production cycle of the attachment;

Before putting the attachment in operation every day, the operator should visually check the general state of its components and request maintenance if he notices strange noises or anomalous situations;

Check that the mechanical parts are always well lubricated (only those components that need lubrication).

When performing cleaning, mounting, dismounting, maintenance and transport, take care to place the attachment in a condition of perfect stability.

HYDRAULIC SAFETY

All regulation, maintenance, repair or cleaning must be performed with the engine stopped and the attachment stably supported on the ground and no residual hydraulic pressure. The residual hydraulic pressure must be discharged by activating the opening and closing controls of the attachment several times with the motor stopped and depressurizing the oil tank. The intervention must be marked on the card in the cabin.

For the hydraulic connections, only and exclusively use hydraulic hoses and fittings conforming to the SAEJ517 or DIN20066 standards for the specified pressures. Failure to observe the above could compromise the safety of the attachment.

Always check the integrity of the hoses to make sure they have not been damaged. If so, have them replaced immediately. Search for leaks using small pieces of paper or cardboard and never with your fingers to avoid possible subcutaneous injections of oil under pressure. The oil can reach very high temperatures. Before performing any service on external surfaces, wait for them to completely cool.

CAUTION The hydraulic system is under high pressure.

Ensure that only high-pressure hoses are used to connect supply to the attachments hydraulic cylinder. Check hoses regularly and renew any that are damaged or worn. Hydraulic supply must not exceed what is recommended in the specification table in this document.

Before working on the hydraulics lower the grab, release the pressure from the system and stop the excavator engine.

When connecting hydraulic rams make sure that the hydraulic hoses are coupled correctly. Pressure should be released from the system both on the excavator and on the implement side prior to coupling the hoses to the tractor hydraulics.

CAUTION Hydraulic oil forced out under pressure can break the skin and cause severe injury. In the event of a hydraulic oil leak stop the excavator flow immediately. DO NOT PUT HANDS NEAR A LEAKING PIPE.

In hydraulic fluid power systems, power is transmitted and controlled through liquid under pressure within an enclosed circuit. Solid particle contaminant is always present in the hydraulic fluid, and the amount needs to be determined because the contaminant may cause serious problems. The operating machine must have clean hydraulic in-line filters. These in-ine filters prevent contaminants from entering sensitive hydraulic components such as valves, cylinders and motors.

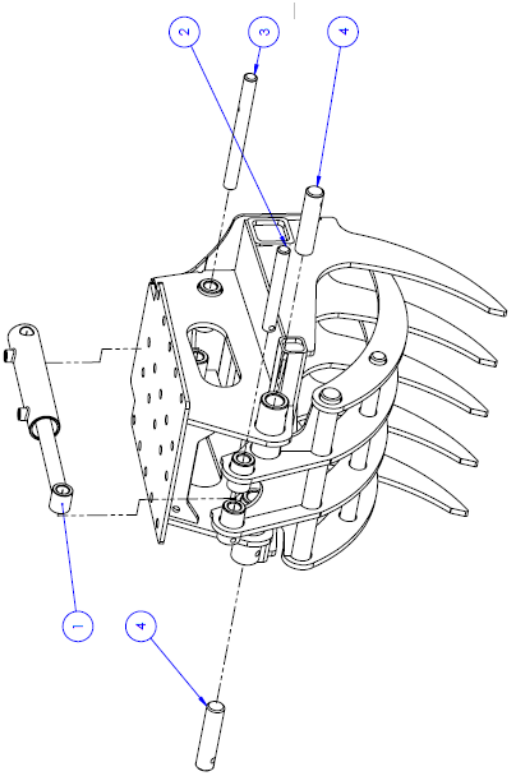
To ensure the attachment and operating machine are kept free from solid particle contaminant, all auxiliary lines powering the attachment must have clean in-line filters. Keeping the hydraulic fluid clean is extremely important for performance and hydraulic oil should be inspected regularly.

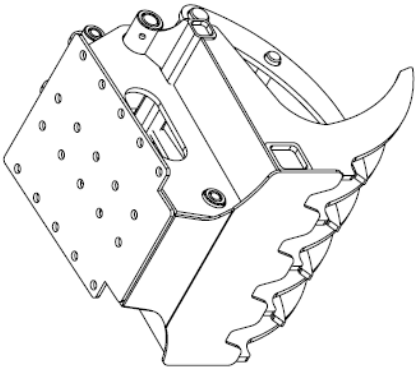
SCORPION GRAB SPECIFICATION

	S500	S750	S900	S1000	S1100	S1600	S1900
SPECIFICATION							
Excavator Size (tonne)	1.5 - 4	4 - 7	8 - 10	10 - 14	14 - 21	18 - 30	30 - 50
Excavator Size (lbs)	3,306 - 8,818	8,818 - 15,432	17,637 - 22,046	22,046 - 30,864	30,864 - 46,297	39,683 - 66,138	66,138 - 110,231
Weight (kilogram/lbs)	140 / 308	280 / 617	405 / 892	616 / 1,358	1,060 / 2,336	1,487 / 3,278	2,800 / 6,172
Teeth Thickness (mm/inch)	10 / ⅜	15 / ⅝	20 / ¾	25 / 1	30 / 1 ⅛	30 / 1 ⅛	50 / 2
Number of rams	1	1	1	1	2	2	2
Grapple Opening (mm/inch)	670 / 26 ⅜	780 / 30 ¾	930 / 36 ⅝	1000 / 39 ⅜	1300 / 51 ⅛	1390 / 54 ¾	1560 / 61 ⅜
Oil Pressure (Bar)	150-200	150-200	150-200	200-250	200-250	200-250	200-250
Hydraulic Flow (Litre)	30-50	40-60	40-60	60-80	80-100	80-100	80-100
Hydraulic Flow (US gallon)	7.92-13.20	10.56-15.85	10.56-15.85	15.85-21.13	21.13-26.41	21.13-26.41	21.13-26.41
OPTIONS							
Two way hitch	✓	✓	✓	✓	✓	✓	✓
OPERATING VEHICLE							
Excavator	✓	✓	✓	✓	✓	✓	✓
Skid Steer	✗	✗	✗	✗	✗	✗	✗
Telehandler	✗	✗	✗	✗	✗	✗	✗
Mini Loader	✗	✗	✗	✗	✗	✗	✗
Crane	✗	✗	✗	✗	✗	✗	✗

SCORPION S500

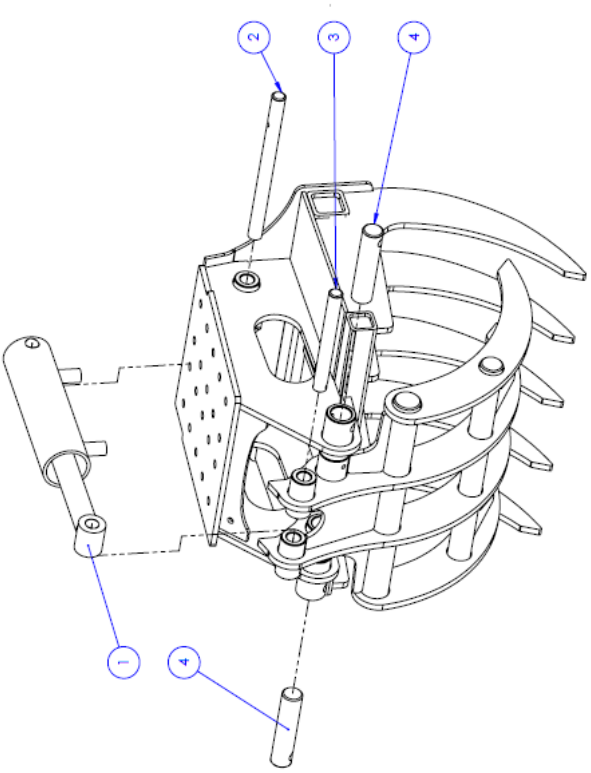
SCORPION S500 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-8M	1	S500 Ram
2	S500P-0028	1	S500 Pin
3	S500P-0026	1	S500 Pin
4	S500P-0027	2	S500 Pin

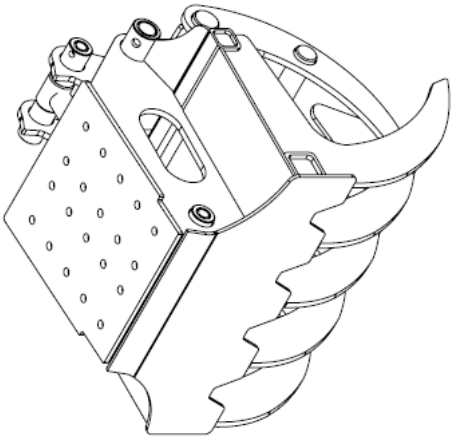




SCORPION S750

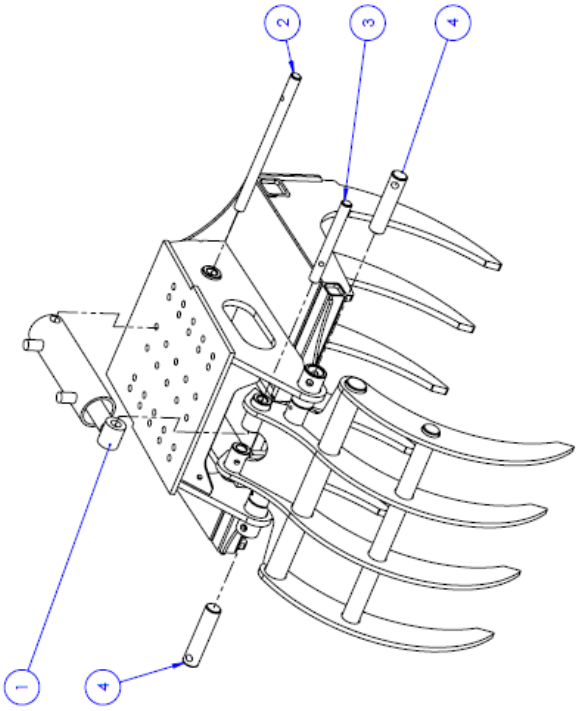
SCORPION S750 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-9M	1	S750 Ram
2	S750P-0030	1	S750 Pin
3	S750P-0029	1	S750 Pin
4	S750P-0028	2	S750 Pin





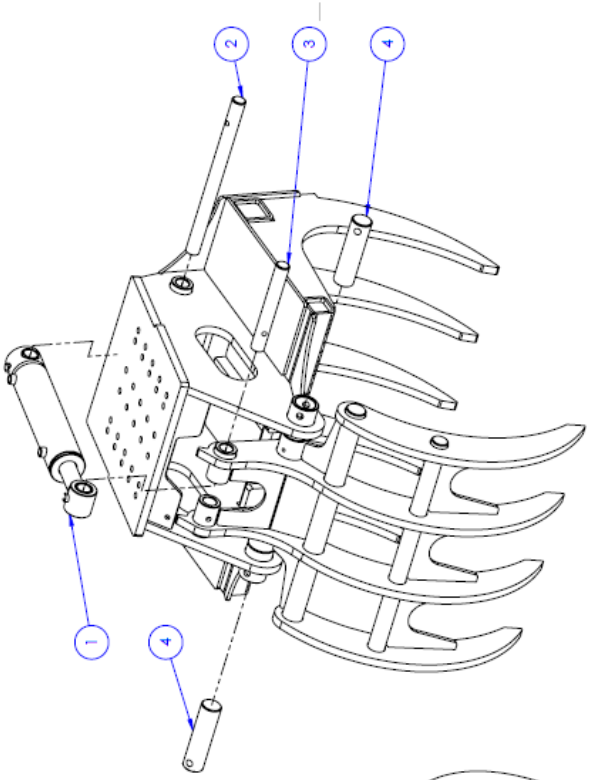
SCORPION S900

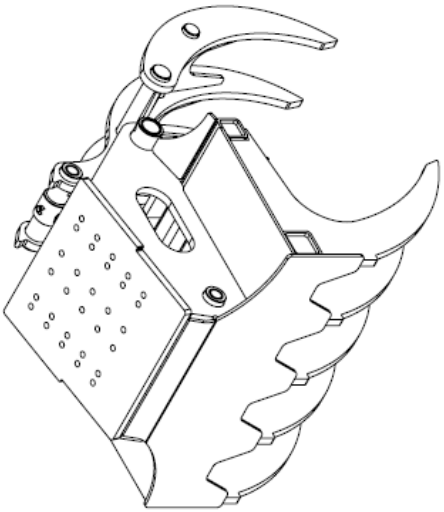
SCORPION S900 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-9M	1	S900 Ram
2	S900P-0030	1	S900 Pin
3	S900P-0029	1	S900 Pin
4	S900P-0028	2	S900 Pin



SCORPION S1000

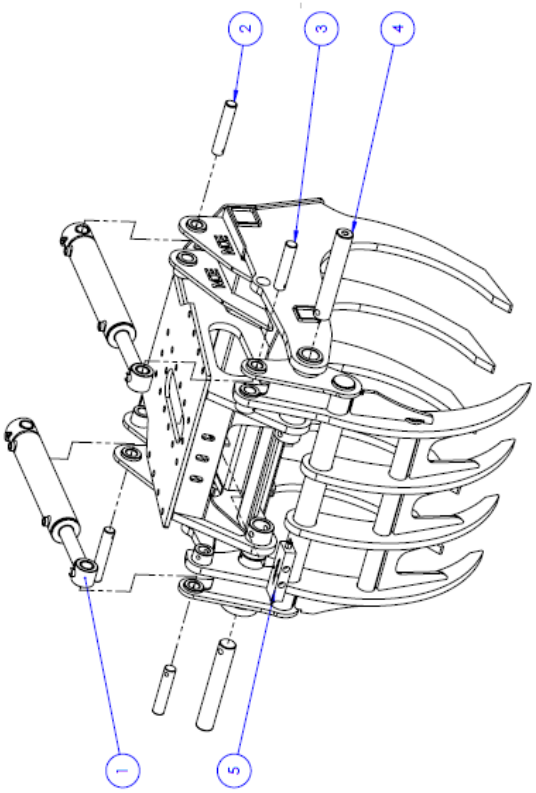
SCORPION S1000 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-6M	1	S1000 Ram
2	S1000P-0039	1	S1000 Pin
3	S1000P-0038	1	S1000 Pin
4	S1000P-0037	2	S1000 Pin

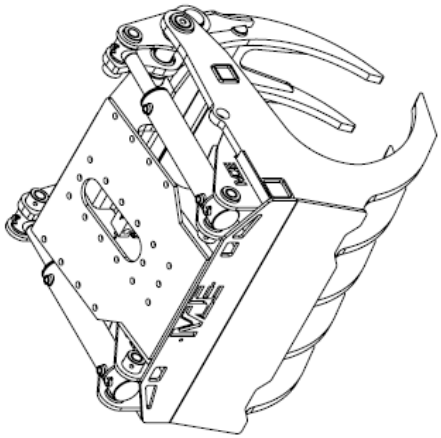




SCORPION S1100

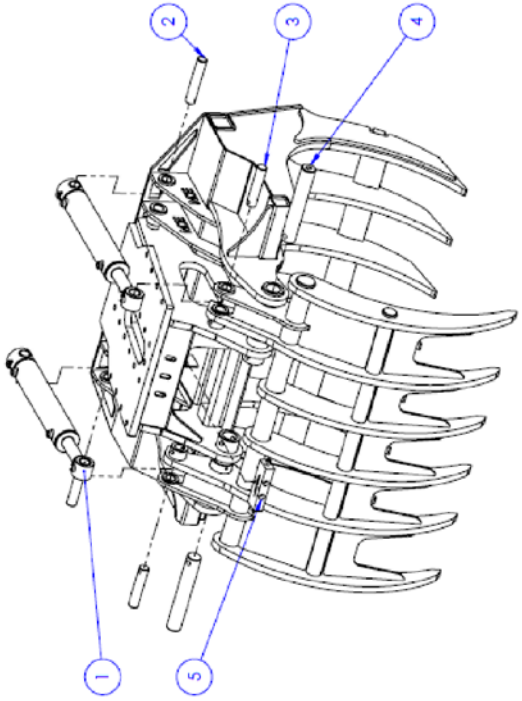
SCORPION S1100 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-22M	2	S1100 Ram
2	S1100P-0035	2	S1100 Pin
3	S1100P-0036	2	S1100 Pin
4	S1100P-0037	2	S1100 Pin
5	BDA4B35	1	Double Counterbalance Valve 3/4"

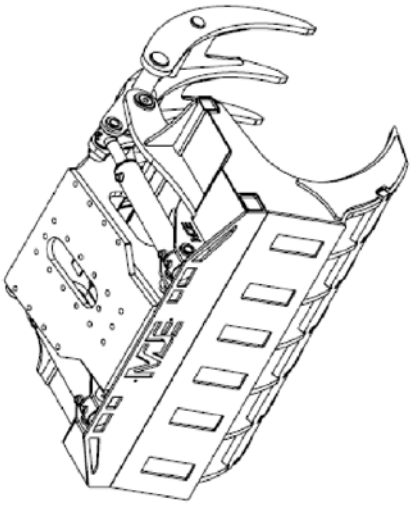




SCORPION S1600

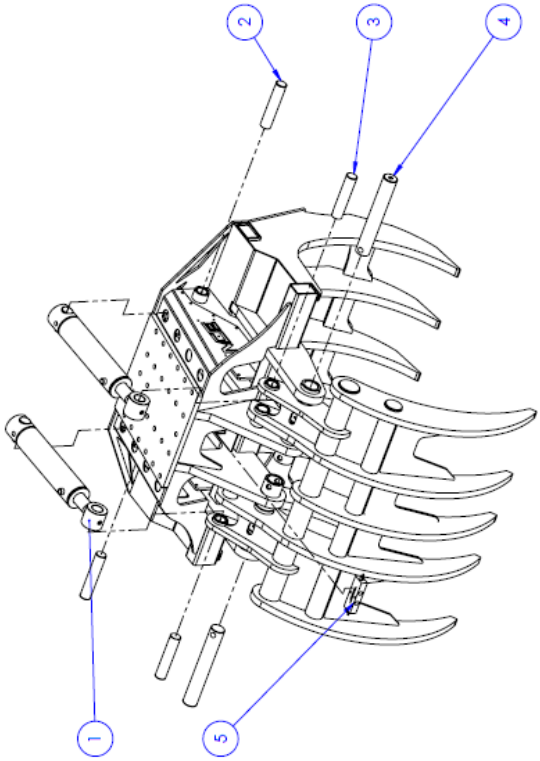
SCORPION S1600 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-22M	2	S1600 Ram
2	S1100P-0035	2	S1600 Pin
3	S1100P-0036	2	S1600 Pin
4	S1100P-0037	2	S1600 Pin
5	BDA4B35	1	Double Counterbalance Valve 3/4"

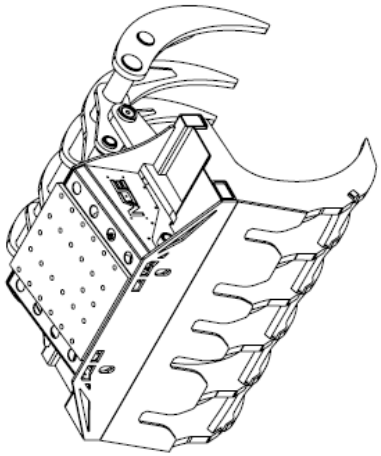




SCORPION S1900

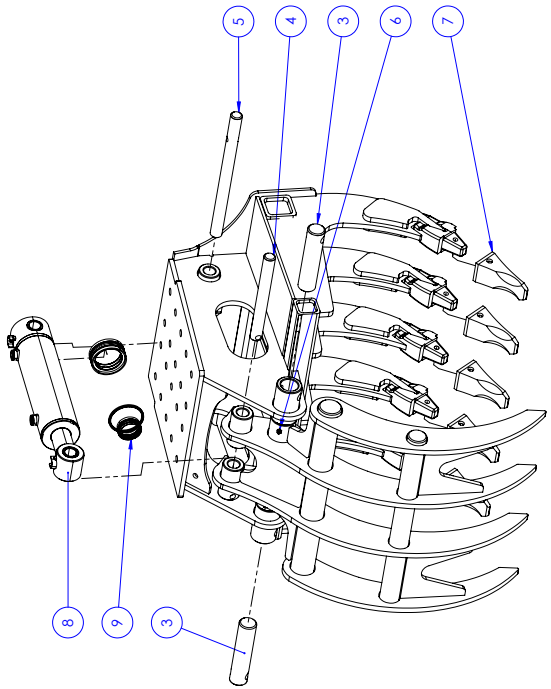
SCORPION S1900 GRAB			
ITEM NO.	PART NUMBER	QUANTITY	DESCRIPTION
1	MDE-7M	2	S1900 Ram
2	S1900P-0033	2	S1600 Machined Pin
3	S1900P-0035	2	S1600 Machined Pin
4	S1900P-0037	2	S1600 Machined Pin
5	BDA4B35	1	Double Counterbalance Valve 3/4"

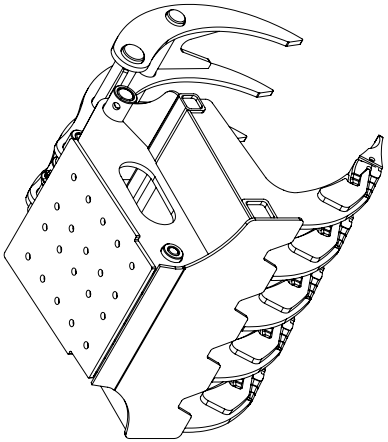




SCORPION S750 (replaceable teeth option)

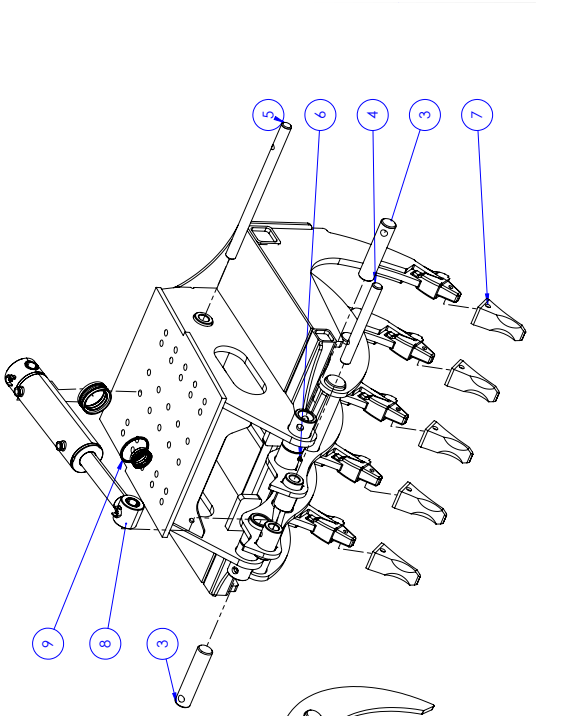
ITEM NO.	Revision	PART NUMBER	QTY.	Description	Material	Part Type	Weight	Finish
3	00	S750P-0028	2	S750 Pin	EN24T	Machined	2.3	Zinc Plated
4	00	S750P-0029	2	S750 Pin	EN24T	Machined	1.5	Zinc Plated
5	00	S750P-0030	1	S750 Pin	EN24T	Machined	2.2	Zinc Plated
6	00	112205	2	M10x1.5 Grease Nipple - Straight	Plain Carbon Steel	Purchased	0.0	As Supplied
7	00	10854	5	Bucket Tooth 200 R	Plain Carbon Steel	Purchased	1.2	As Supplied
8	00	MDE-21	1	90/50 200 Stroke (Manufactured)	Material <not specified>	Purchased	37.8	As Supplied
9	00	XP0036	1	Seal Kit	Plain Carbon Steel	Purchased as Assembly	0.6	As Supplied

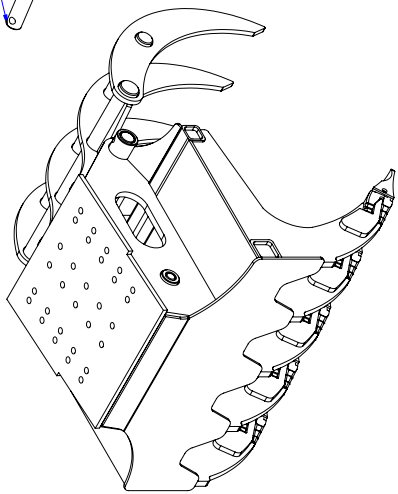




SCORPION S900 (replaceable teeth option)

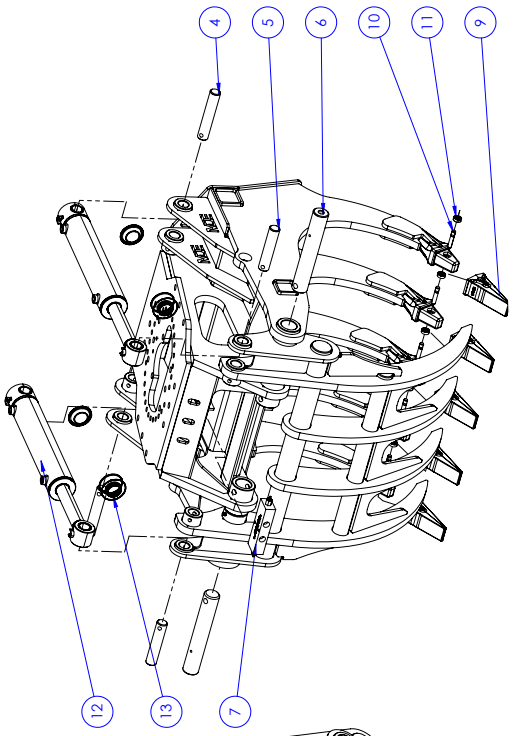
ITEM NO.	Revision	PART NUMBER	QTY.	Description	Material	Part Type	Weight	Finish
3	01	S900P-0028	2	S900 Pin	EN24T	Machined	2.3	Zinc Plated
4	01	S900P-0029	1	S900 Pin	EN24T	Machined	1.5	Zinc Plated
5	01	S900P-0030	1	S900 Pin	EN24T	Machined	2.6	Zinc Plated
6	00	10205	2	M10x1.5 Grease Nipple - Straight	Plain Carbon Steel	Purchased	0.0	As Supplied
7	00	10854	5	Bucket Tooth 200 R	Plain Carbon Steel	Purchased	1.2	As Supplied
8	00	MDE-21	1	90/50 200 Stroke (Manufactured)		Purchased	37.8	As Supplied
9	00	XM005E	1	Seal Kit	Plain Carbon Steel	Purchased as Assembly	0.6	As Supplied

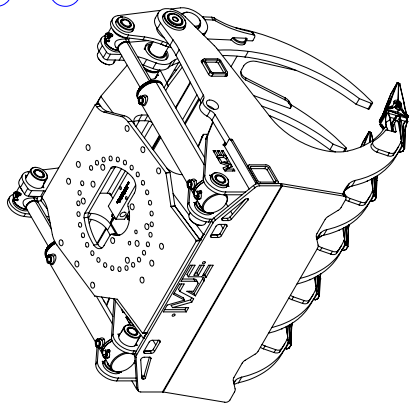




SCORPION S1100 (replaceable teeth option)

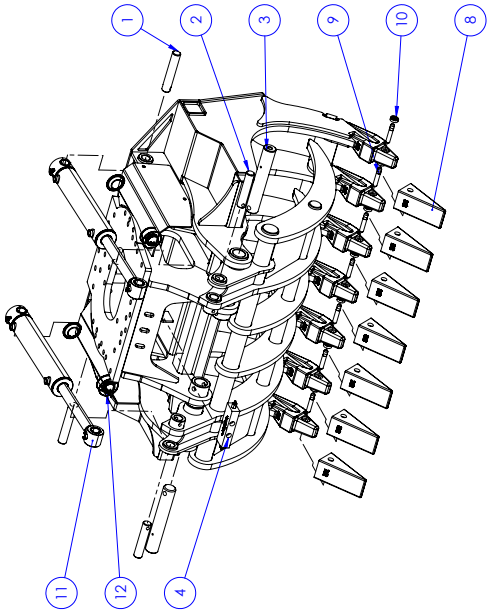
ITEM NO.	Revision	PART NUMBER	QTY	Description	Material	Part type	Weight	Finish
4	02	S1100P-0035	2	S1100 Pin	EN24T	Machined	2.0	Zinc Plated
5	02	S1100P-0036	2	S1100 Pin	EN24T	Machined	1.8	Zinc Plated
6	01	S1100P-0037	2	S1100 Pin	EN24T	Machined	7.7	Zinc Plated
7	00	BDA8135	1	Double Counterbalance Valve 3/4"	Plain Carbon Steel	Purchased	4.3	As Supplied
8	00	10205	2	M10x1.5 Grease Nipple - Straight	Plain Carbon Steel	Purchased	0.0	As Supplied
9	00	10838	5	Bucket Tooth 250	Plain Carbon Steel	Purchased	2.6	As Supplied
10	00	10840	5	Tooth Pin 250	Plain Carbon Steel	Purchased	0.1	As Supplied
11	00	10841	5	Pin Retainer 250	Plain Carbon Steel	Purchased	0.0	As Supplied
12	00	MDE-22-A	2	90/50 400 Stroke (Manufactured) - 40mm Pins		Purchased	56.4	Painted
13	ANY	MDE-22 Seal Kit	2	Seal Kit		Purchased as Assembly	0.2	As Supplied

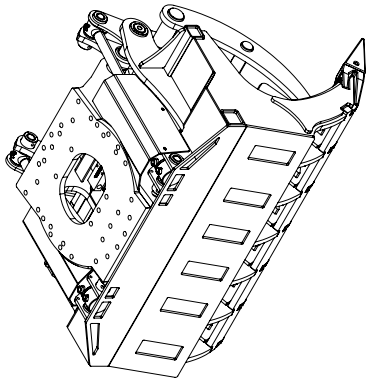




SCORPION S1600 (replaceable teeth option)

ITEM NO.	Revision	PART NUMBER	QTY.	Description	Material	Part Type	Weight	Finish
1	02	S1100P-0035	2	S1100 Pin	En24T	Machined	2.0	Zinc Plated
2	02	S1100P-0036	2	S1100 Pin	En24T	Machined	1.8	Zinc Plated
3	01	S1100P-0037	2	S1100 Pin	En24T	Machined	7.7	Zinc Plated
4	00	BDA-4835	1	Double Counterbalance Valve 3/4"	Plain Carbon Steel	Purchased	4.3	As Supplied
8	00	10830	7	Bucket Tooth 330	Plain Carbon Steel	Purchased	6.4	As Supplied
9	00	10832	7	Tooth Pin 330	Plain Carbon Steel	Purchased	0.2	As Supplied
10	00	10833	7	Pin Retainer 330	Plain Carbon Steel	Purchased	0.1	As Supplied
11	00	MDE-22-A	2	90/60 400 Stroke		Purchased	56.4	Painted
12	ANY	MDE-22 Seal Kit	2	Seal Kit		Purchased as Assembly	0.2	As Supplied





WARNING STICKERS

INSPECTION / SERVICE RECORD

Work Carried Out	Date	Hours	Completed
Guard Inspection			
Teeth / Tine Inspection			
Arm Inspection			
Grease Used			
All Bolts Torqued			
Hydraulic Hose Inspections			
Hydraulic Fitting Inspections			
Visual Check Over			

Work Carried Out	Date	Hours	Completed
Guard Inspection			
Teeth / Tine Inspection			
Arm Inspection			
Grease Used			
All Bolts Torqued			
Hydraulic Hose Inspections			
Hydraulic Fitting Inspections			
Visual Check Over			

INSPECTION / SERVICE RECORD

Work Carried Out	Date	Hours	Completed
Guard Inspection			
Teeth / Tine Inspection			
Arm Inspection			
Grease Used			
All Bolts Torqued			
Hydraulic Hose Inspections			
Hydraulic Fitting Inspections			
Visual Check Over			

Work Carried Out	Date	Hours	Completed
Guard Inspection			
Teeth / Tine Inspection			
Arm Inspection			
Grease Used			
All Bolts Torqued			
Hydraulic Hose Inspections			
Hydraulic Fitting Inspections			
Visual Check Over			