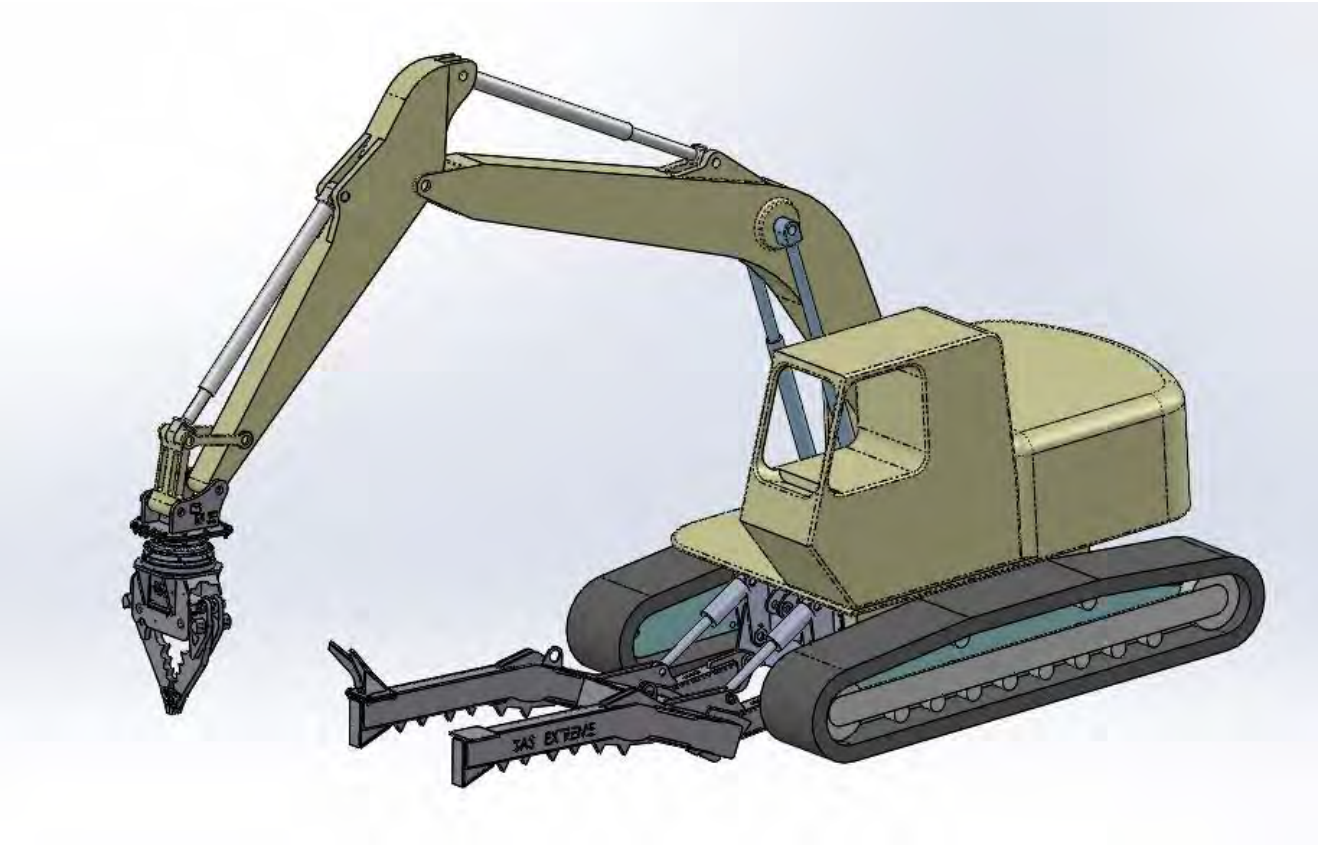
SASFORKS

engineered tough



EXTREME™

Auto Processor

Excavator Attachment

==========

Manual v22

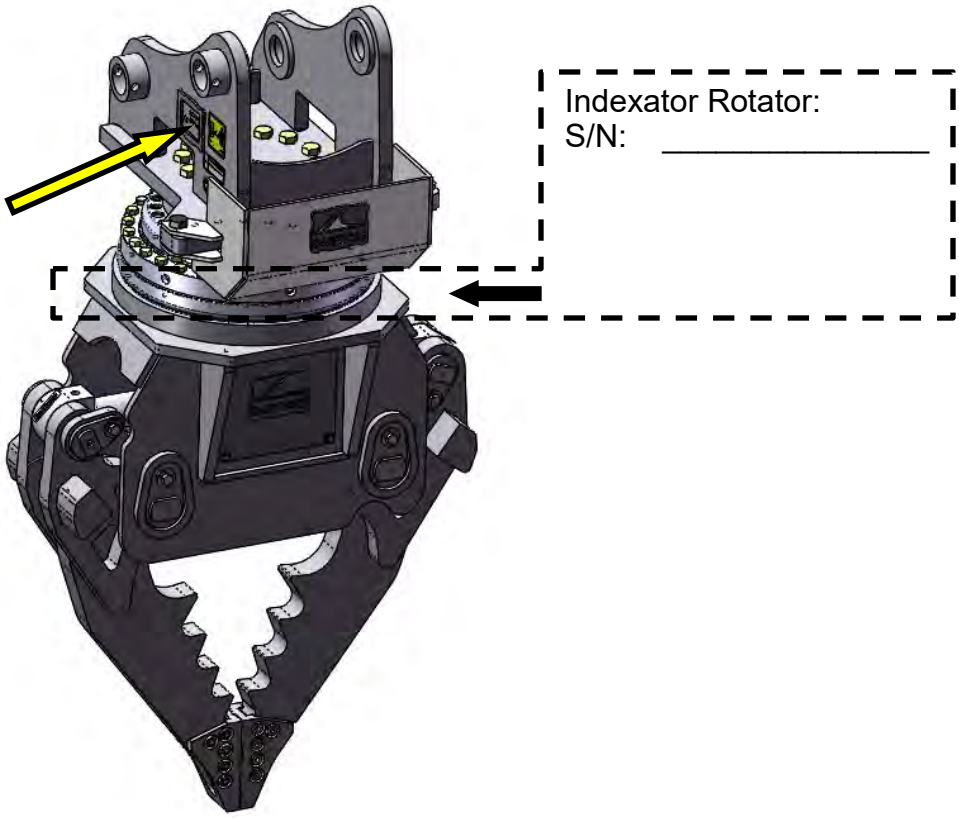
USA Patents: D672,369 ; D704,752 ; D740,861, 9,211,832 ; D747,170 ; 8,414,704 ; D779,564; D779,565, 9,414,704

SERIAL NUMBER LOCATIONS

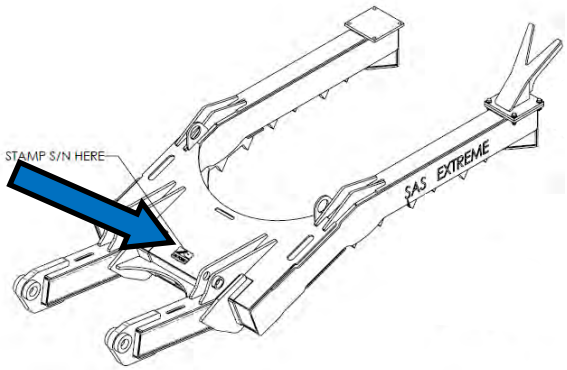
Locate serial numbers on SAS EXTREME Auto Processor Attachment..

Note reference below. Providing this information when contacting your local Distributor, Supplier, Service Representative, or SAS will improve accuracy and level of service.

SAS EXTREME
Serial Number _____



SAS EXTREME Hold Down Arm Assembly.....Serial Number _____



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LIMITED INTENDED USE OF THIS EQUIPMENT:

SAS EXTREME™ Auto Processor excavator attachment is designed break recyclable scrap materials from end of life cars and trucks. Not intended to remove or contact batteries, due to corrosive, spark, electrical shock, explosive and fire risks. Materials removed from cars and trucks will be damaged. Some excavators may require modification to pressures, valves, cylinders, reinforcement of x-frame, or other modifications for installation and to operate in a desirable manner. This attachment is considered a non-OEM attachment and has not been approved by any specific excavator manufacturer. Customer is responsible to read the excavator's manual and warranty documents, if any, and identify any impact installation and use of this attachment may have on the excavator's warranty. Read this manual completely before installation or use.

SAFETY

Safety is the most important issue in the workplace. Observing safety guidelines, equipment capacities and using common sense will provide a work environment that is safe and efficient for employees, management and customers. It is important that you and your operators read and understand the information included in this manual prior to use of this equipment.

Safety warnings are highlighted through out this manual. Understanding the significance of these symbols is important. The following is a definition of each symbol you will encounter in this manual:

The Symbol is intended to draw your attention to important safety information, hazard or precaution.

DANGER The Danger Symbol indicates a hazardous situation that if not avoided will result in serious injury or death

WARNING The Warning Symbol indicates a hazardous situation that if not avoided could result in serious injury or death

CAUTION The Caution Symbol indicates a hazardous situation that if not avoided could result in minor injury or potential property damage

NOTICE The Notice Symbol indicates worst credible severity of harm is property damage.

The following information presented in this Operator Manual for SAS FORKS™ is intended to be a guide only, and is not meant to encompass all issues that may need to be addressed for your particular type of business operation.

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USA Patents: D672,369 ;D704,752 ; D740,861; D779,564; 9,815,128; D779,565; 9,211,832; 9,414,704; D747,170

No information, pictures, designs, products, features, or forks may be duplicated in part, entirety, or in likeness.

GENERAL SAFETY GUIDELINES

Installation & operation of equipment should only be performed by qualified and trained individuals. All persons operating or working in the area of operation should read this manual. A copy of this manual should be kept with the equipment. A qualified operator will operate the machine safely in accordance with, and:

- Understand the written instructions supplied by the manufacturer of the device, the manufacturer of the excavator, all company rules and any applicable OSHA or regulatory governing body regulations.
- Completed training including actual operation of the device and excavator to which it is attached.
- Know and follow the safety rules and regulations of the jobsite.

⚠WARNING Operation of equipment by un-qualified or un-trained individuals can result in serious injury or death. All operators must be properly trained prior to operation.

⚠WARNING Not designed to be operated in an explosive environment. Only use this equipment in well ventilated areas, a sufficient distance away from flammable or explosive gases, liquids or substances to avoid risk of ignition. Operating in an explosive environment may cause an explosion and fire, resulting in injury, death, property damage.

⚠WARNING Serious bodily injury, death and property damage can caused by an operator that is under the influence of drugs or alcohol (of any type, illegal, prescribed or over the counter) due to impaired operator judgment. Do not operate when impaired. Consult your physician before operation of this equipment while on medication.

⚠WARNING Inspect the device and perform all preventative maintenance before operation at the start of every work shift. Failure to perform inspections or proper maintenance can result in equipment failure resulting in serious injury or property damage.

⚠WARNING This equipment is operated by high pressure hydraulics. Hydraulics are a stored power source and as such must be treated as energized at all times. Be certain pressure has been relieved prior to handling, inspecting or performing maintenance on this unit. Follow lockout tag out procedures and release all stored energy before servicing equipment. Failure to release energy or disable hydraulic energy can result in serious injury or death. High pressure fluids can also discharge at great velocity and cause injection into skin. Wear safety glasses and appropriate gloves while inspecting, operating and maintaining this equipment.

⚠ DANGER This equipment has numerous moving components. Operate only from the cab equipped with safety glass windshield and adequate protective steel guard while seated and wearing a safety belt. Be aware of potential pinch points and keep clear during operation, inspection and maintenance. Pinch points exist between grapple attachment jaws, cab swing, hold down arms and others, failure to keep clear while in operation can result in serious injury or death.

⚠WARNING Do not exceed posted weight limits on equipment.
Exceeding rated load limits will result in equipment damage, loss of steering control, machine tip over, serious injury or death.

GENERAL SAFETY GUIDELINES

PROTECTIVE EQUIPMENT

- Safety glasses with side shields
- Work boots with heavy sole and safety toes
- Fire extinguishing equipment
- Other such safety equipment to protect personnel from injury.
- Leather gloves
- Hard hat
- Adequate spill kit, oil dry etc.

CAUTION **Puncture or cut injuries may occur if contact made with sharp objects. Sharp objects are present from breaking materials out of scrap cars. Avoid contact.**

WARNING **Do not work under grapple claws, hold down, or any object lifted by this equipment. An unexpected movement, shift in the object, or hydraulic failure may cause claw, hold down, or object drop. Serious injury or death may occur.**

PERSONNEL TRAINING

Prior to installation or use of this equipment all personnel must review this operator manual, excavator manufacturer's manual and other pertinent safety manuals and be trained by qualified personnel. All hazards must be identified to ensure personnel avoid these hazards. Signed documentation certifying individual training has been completed is a must. Periodic retraining is recommended. Failure to follow Manufacturers recommendations can result in serious injury and property damage.

SITE PREPARATION & CLEAR OPERATING SPACE RECOMMENDED

- The Extreme™ Auto Processor should only be used in areas that are equipped with proper fluid containment measures, to ensure capture and containment of residual fluids in accordance with any and all environmental regulating body.
- Operation area must be sufficiently clear of buildings and overhead power lines.
- No Smoking, Safety Glasses & Hard Hat Required signage is recommended.
- Provide adequate space around this equipment to ensure all persons are kept at least 15 Meters (50 feet) away from the equipment and cars being moving by it.

VEHICLE PREPARATION PRIOR TO USING THE EXTREME™ AUTO PROCESSOR

- Prior to use of this attachment, remove all batteries, gasoline, diesel fuel, all types of fuels, mercury switches, air conditioning Freon, engine oil, transmission fluid, antifreeze and other fluids.
- Engines, transmissions, and other components will be damaged, and only be suitable for metals recycling, not as cores or resalable operable parts.

WARNING

Vehicles contain several hazardous elements that pose explosion, release of toxic gas, and fire hazards, such as gasoline and electric batteries containing battery acid, lithium-ion and other battery materials. Cars may have batteries in multiple locations, some obvious and some hidden. Be sure all liquids and batteries are safely removed prior to using EXTREME™ Auto Processor. Failure to remove may result in explosion, release of toxic gas, fire & injuries. Keep adequate fire suppression equipment accessible and persons trained on operation.

CE SPECIFIC NOTICES

EMERGENCY STOP FUNCTION

To immediately stop the motion of this equipment:

1. Operator is to release all joystick button(s).

Additional secondary measures to immediately stop the motion include:

2. Moving excavator's auxiliary hydraulic 3rd spool lever to neutral position
3. Turn off ignition key of excavator to shut off engine

All three emergency stop options stop flow of hydraulic fluid. See excavator manufacturer's operator manual to identify proper controls & functions prior to use.

Even after emergency stop function is followed, there is residual stored hydraulic pressure in the system. See following:

THIS EQUIPMENT IS OPERATED BY HIGH PRESSURE HYDRAULICS.

Hydraulics are a stored power source and as such must be treated as energized at all times. Be certain pressure has been relieved prior to handling, inspecting or performing maintenance on this unit. Follow lockout tag out procedures and release all stored energy before servicing equipment. Failure to release energy or disable hydraulic energy can result in serious injury or death. High pressure fluids can also discharge at great velocity and cause injection into skin. Wear safety glasses and appropriate gloves while inspecting, operating and maintaining equipment.

STAY CLEAR

- Do not lift persons with this equipment. Not intended to lift people
- Always maintain a safe distance away from this equipment.
- Do not go near or under this equipment or any object lifted by this equipment. Failure to stay clear will result in injury or death.
- Refer to and follow all additional safety information in excavator manufacturer's operator, safety and service manuals.

POWER FAILURE

In the event of electrical or hydraulic supply failure from the excavator occurs, the equipment will stop further motion. Under normal circumstances the equipment is not expected to drop a load. *The symbol at the left indicates the hydraulic controls on this equipment are normally closed*. Thus without electrical power the gate valves are closed, in essence halting further movement. **See excavator manufacturer's operator manual to identify actual operation during power failure mode prior to use**.

SOUND

This equipment does not emit more than 70dba.

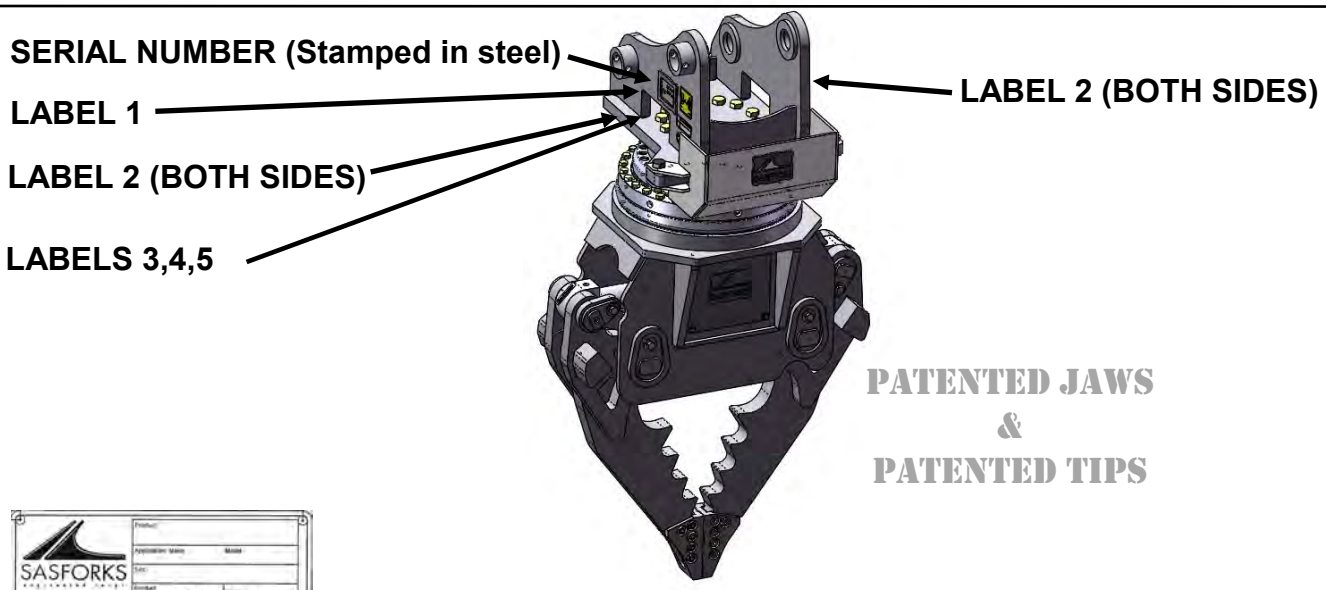
VIBRATIONS

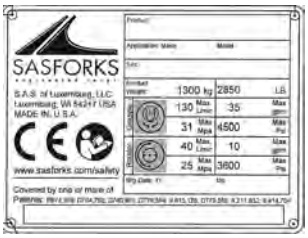
This equipment does not transfer vibrations in excess of 2.5m/s2.

OPERATING TEMPERATURE

Equipment is best suited to operate in temperatures 0°C to 32°C (32°F to 90°F) with minimum temperature –30°C (–23°F) and maximum temperature 65°C (150°F)

SAFETY LABELING (PAGE 8)
SAS™ EXTREME™ AUTO PROCESSOR





	Label Description	Quantity	Label reorder #
LABEL 1:	PRODUCT ID PLATE	1	ID PLATE CE-EX-V5

LABEL 2:	KEEP BACK 15 METERS (50 FT)	2	W-LAB-STAYBACK50FT
LABEL 3:	KEEP AWAY MOVING PARTS	1	W-LAB-WARNING-PINCH

LABEL 4:	READ EQUIPMENT MANUALS	1	W-LAB-READ-504060

LABEL 5:	HIGH PRESSURE HYDRAULICS1	1	W-LAB-PRES-503600

LABEL 6:	STABILITY LABEL FOR CAB	1	W-LAB-EX-STABLE-1

INSTALLATION: PREPARATION

ADVANCE PREPARATION BEFORE ARRIVAL & INSTALLATION OF EXTREME AUTO PROCESSOR

- Review this operator manual. Review operator, safety & service manuals of excavator manufacturer.

Items you need to obtain before arrival of Extreme™ Auto Processor:

- Head Assembly: Excavator must have two bi-directional auxiliary hydraulics at the end of the stick with cab controls.
- Hold Down Assembly: Excavator must have hydraulic circuit on lower x-frame or dozer.
- Hydraulic fluid (Consult excavator OM manual) Identify fluid check and fill points.
- Identify and obtain hydraulic hose quick connections and fittings to connect your machine to the Extreme.
- Locate supplier to make hydraulic hoses. Minimum recommend 19 mm (3/4") diameter, 34 Mpa (5,000 PSI) hoses and fittings once proper length is determined during installation.

Tools your mechanic may need for installation:

- Sockets, wrenches, large adjustable wrench, large rubber hammer, hydraulic bottle jack, grease gun

Service to do on your excavator in advance:

- Have maintenance personnel replace hydraulic system filters & fluids (as needed)
- Pressure and flow test. Have pressure results available. Set pressures:
  Grapple: Not to exceed: 94 L/m (25 gpm) & 31 MPa, 310 Bar (4,500 psi)
  Rotator: Not to exceed: 40 L/m (10 gpm) & 17 MPa, 170 Bar (3,600 psi)
- Inspect pins & bushings in arm and dozer blade for wear (replace as needed)
- SAS has no responsibility as to performance of excavator's hydraulic system with this attachment.

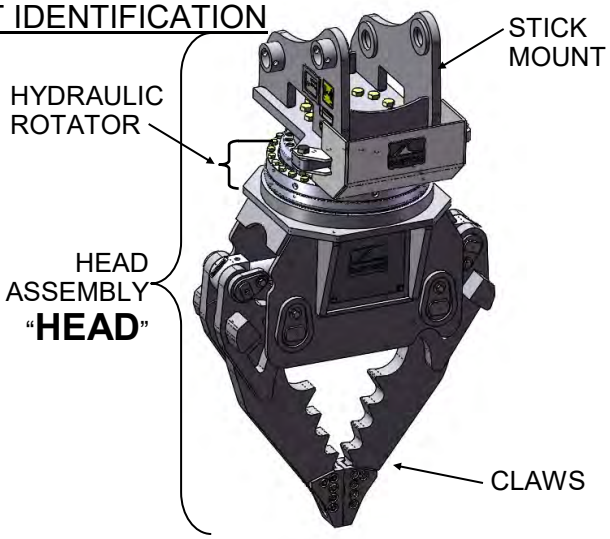
Available for training:

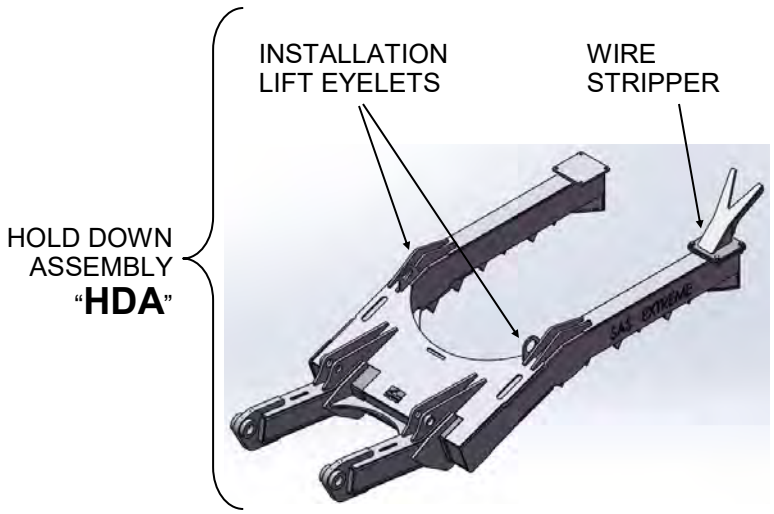
- Designate an area (i.e. where it is safe to run equipment) and an employee to operate unit
- Designate operator who can read and speak English, if SAS staff onsite to assist your mechanic.

Installation Hazards (Additional details covered elsewhere in this manual):

- Pinch & crush points, High pressure hydraulics, Stored pressure, Skin injection risk
- **Installing this Extreme Head & Hold Down Assembly will change lifting dynamics & likely reduce lift capacity and reduce stability of the excavator**.
- Installer and operator must use caution in establishing reasonable lift capacities. Consider Head & HDA attachment weights and excavator manufacturer's manual guidance. These hazards may cause equipment damage, injury or death. Only qualified persons should complete installation.

PONENT IDENTIFICATION





INSTALLATION: PREPARATION

POTENTIAL X-FRAME REINFORCEMENTS TO CONSIDER:

Excavator OEM x-frame brackets which mount OEM dozer blade may not provide sufficient distribution of loads from SAS Extreme Hold Down Arm attachment & may result in x-frame & bracket structural failure.

- Careful consideration of this information will reduce the likelihood of x-frame & x-frame bracket failure.
- Operational advice: Minimize the amount of down force applied when restraining the car, specifically, avoid pushing down to the extent that the front of the excavator is lifted and suspended.
- This document is not authorization to modify excavator x-frame, it is intended to provide a guide for consideration of reinforcements for Customer, OEM, OEM authorized equipment tech., & professional welder.

NOTICE: Any reinforcement work may cause Excavator OEM warranty, if any, to be void.

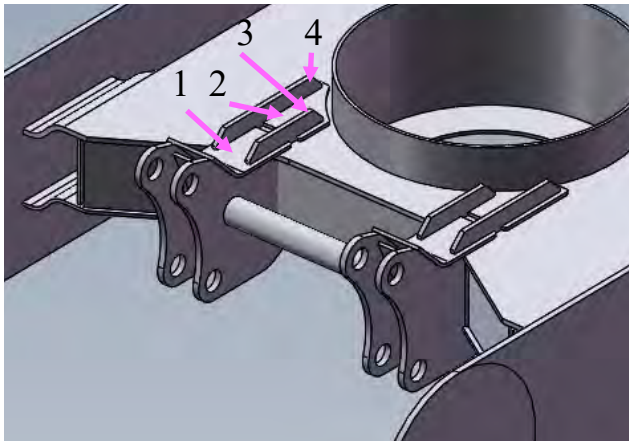
- Any reinforcement/modification of x-frame may cause other unintended cracking or damage. SAS is not responsible for reinforcement installation or performance, or resulting issues, if any.

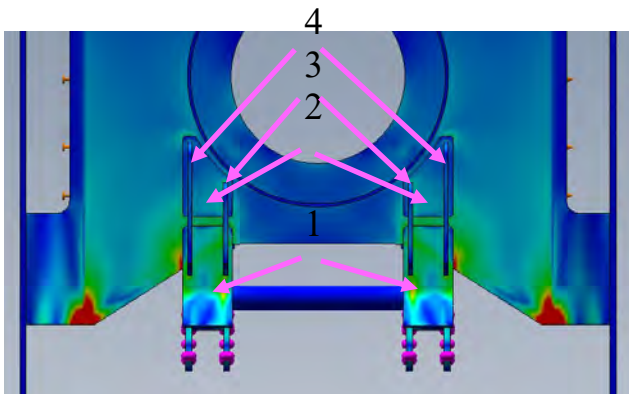
SAS Limited Warranty applies only to SAS manufactured components, not excavator, x-frame or x-frame brackets.

Intent is to extend the force back further on x-frame where there is internal support to dissipate the loading forces.

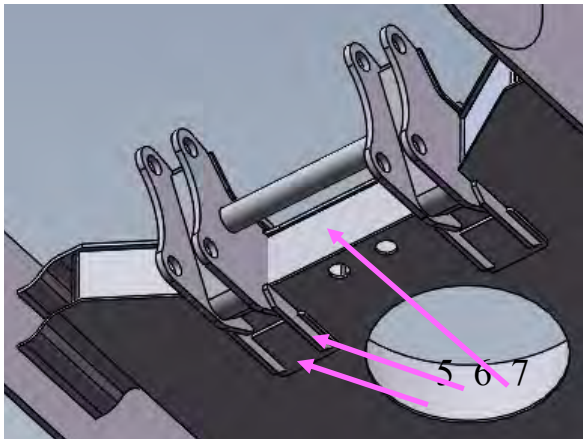
Reference:
1 - OEM hinge base plate existing
2 - NEW hinge base plate expansion (two)
3 - NEW inner vertical load rib extension (two)
4 - NEW outer vertical load rib extension (two)
5 - NEW lower base plate expansion (two)
6 - NEW lower load rib extension (four)
7 - NEW mid hinge frame tie in plate (one)

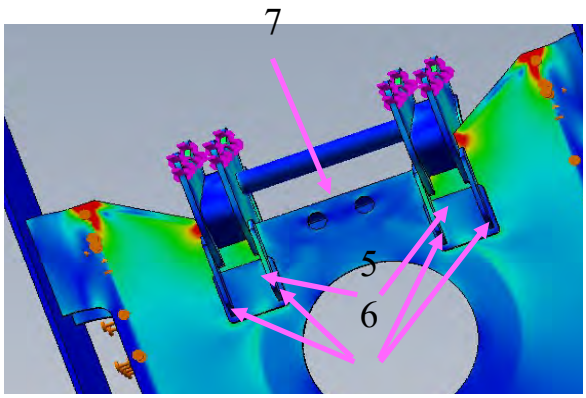
Upper view





Lower view





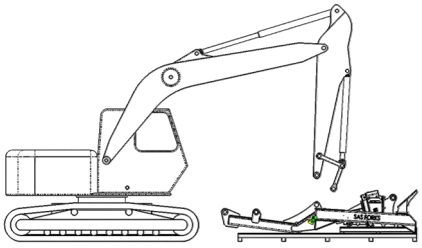
WARNING Welding can damage excavator electronics. Read excavator manufacturer's manual before welding. **NOTICE**

High pressure hydraulics. Stay clear of pinch points to avoid serious injury. Relieve pressure prior to work. Follow safety precautions in SAS EXTREME Auto Processor Manual prior to work. **www.sasforks.com/safety**

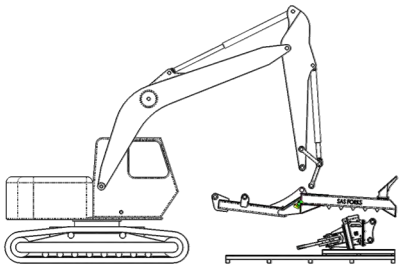
INSTALLATION: HOLD-DOWN ASSEMBLY

INSTALLATION OF SAS EXTREME AUTO PROCESSOR HOLD DOWN ASSEMBLY (HDA):

INSTALLATION SHOULD BE COMPLETED BY AN EXPERIENCED HEAVY EQUIPMENT MECHANIC

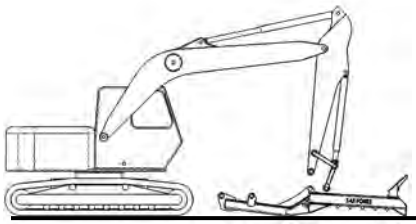


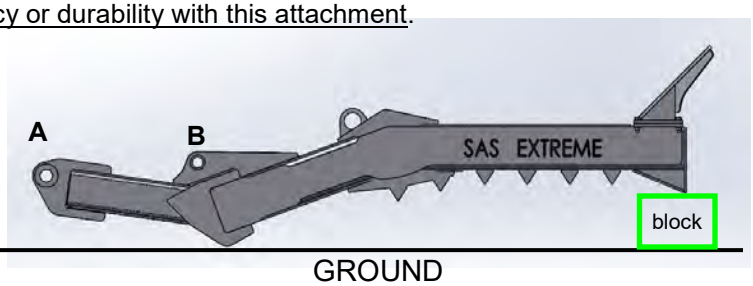
1. Remove existing dozer blade. Inspect pins and bushings. Replace as needed.
2. Hold Down Assembly (HDA) weight approximately 1,620 kg (3,575 LB). Eyelets in center of HDA is balance point. If excavator is sufficiently rated to lift such, align stick with lifting eyelets. Using safe and adequately rated rigging chains, keeping all persons clear, lift HDA off pallet. Move away from shipping pallet and place on ground with block in place which will allow upper surface of HDA to be level. See HAD ID tag for specific weight.



3. HDA should be set level as shown below for staging. Drive excavator up to HDA and align lower pivot holes in dozer blade mount on excavator with holes "**A**" in HDA. Insert and secure pivot pins into assembly.
4. With pivot pins inserted and secure, slowly extend dozer blade hydraulic cylinders to align holes in rod end of cylinder to lift holes "B" in HDA. Keep clear of pinch points. Insert and secure pivot pins into assembly.
5. Replace any guarding that may have been removed during the removal of the dozer blade assembly.

SAS has no responsibility as to performance of excavator's Hydraulic system or structural adequacy or durability with this attachment.

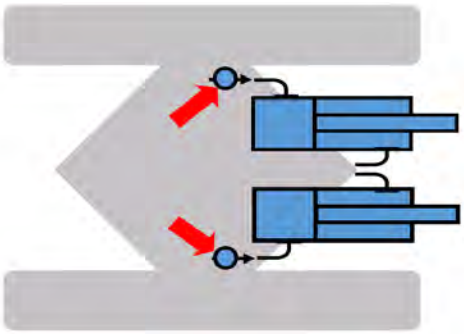




GROUND

AFTER INSTALLATION, PRIOR TO OPERATION

1. Grease all pivot points with Stick and HDA resting on the ground and machine engine off.
2. Stay clear of pinch points. Slowly engage controls. Watch for interference. Stop if interference occurs.
   a) **Test up and down** motions of HDA. Due to differences in machines and cylinder control valves, if down cycle is not smooth, a jerking condition may occur.



Typically this can be rectified by installing simple flow control valves on hydraulic lines which feed extend side of dozer cylinders. (Indicated by arrows). (see Hold Down Parts list on separate page). Two flow control valves are included in parts kit with Qty 2, SAS Part No. HV-FLW-D-EF30S : Thread #8 NPT

Install flow control valves with fittings between car body frame hose connection and hydraulic hose. Turn settings to near zero.

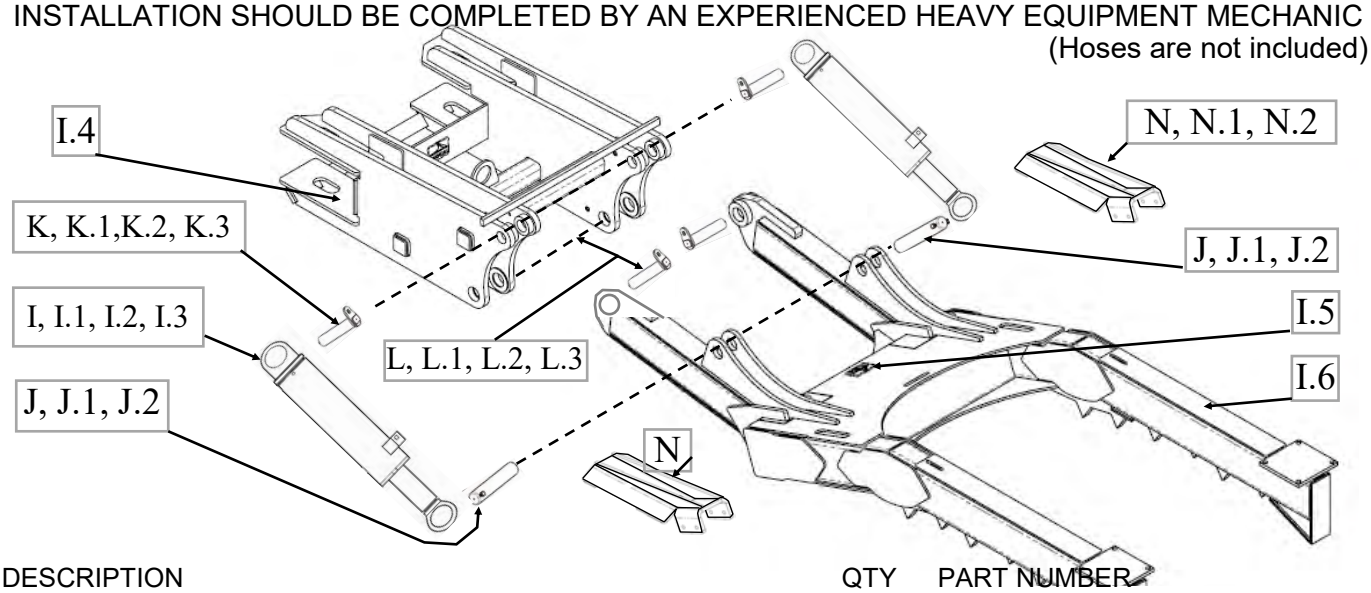
Test motion. Slightly open valves uniform amount. Retest. Repeat until jerking occurs, then turn back to achieve smooth motion.

b) **Test rotational clearance** with HDA raised incrementally higher. Stay clear of pinch points, overhead electrical wires, and other structures, slowly and cautiously rotate cab and counter weight visually checking for interference of lower cab and counter weight with HDA lifted at highest level.

Stop if interference occurs & contact SAS FORKS with serial number for engineering assistance.

INSTALLATION: HINGE & HYDRAULICS (PAGE 12)
SAS™ EXTREME™ AUTO PROCESSOR

OPTIONAL: SAS SUPPLIED HINGE, HYDRAULIC DIVERTER BLOCK & CYLINDERS:
INSTALLATION SHOULD BE COMPLETED BY AN EXPERIENCED HEAVY EQUIPMENT MECHANIC
(Hoses are not included)



	DESCRIPTION	QTY	PART NUMBER
[I]	**Cylinder for SAS Hinge & Hold Down**	**2**	**HY-CYL-5.0X11.25-5K**
	This cylinder is not for use with excavator which had existing dozer blade. Call excavator manufacturer.		
	CYLINDER COMPONENTS (IDENTIFY CYLINDER STAMP TO SELECT CORRECT PARTS)		
	BM: Cyl stamp includes…. BM….I.-1 CYL SEAL KIT……	1	HK-5.00-783-244
	Cyl stamp includes…. BM….I.-2 CYL PIN BUSHING	2	W-B2.500X3.000X2.000
	Cyl stamp includes…. BM….I.-3 CYL PIN GREASE SEAL.	2	W-WIPER-2.5X3.0
	RR: Cyl stamp includes…. RR….I.-1 CYL SEAL KIT	1	HK-5.00-732703
	Cyl stamp includes…. RR….I.-2 CYL PIN BUSHING	2	W-B2.505X3.002X2.000
	Cyl stamp includes…. RR….I.-3 CYL PIN GREASE SEAL	2	W-WIPER-2.5X3.0
	I.4 Hinge (weldment)	1	0-EX-HGN- Custom per machine
	Read warnings on “Excavator Frame Reinforcement’ page & separate instructions provided with hinge.		
	I.5 Id plate (Specify serial no.)	1	ID-PLATE-CE-EX
	I.6 Hold down arm (weldment)……	1	0-EX-HD- Custom # per machine
[J]	**Pin (cylinder to hold down: rod end)**	**2**	**1903-202VOL220-5112**
	J.1 Bolt (for cyl rod end pin)	2	WBOLT 0.375X425 GR8
	J.2 Nut (for cyl rod end bolt)……	2	WNUT 0.375-16-GR8-NY
[K]	**Pin (cylinder to hinge: base end)**	**2**	**1904-006VOL220-5112A**
	K.1 Bolt (cylinder base pin)	2	WBOLT 0.625X1.50 GR8
	K.2 Pin lock spacer (cylinder base pin)……..	2	SPACER-0625-0000
	K.3 Flat Washer (cylinder base pin)……	2	WASHER-F 0.625 GR8
[L]	**Pin (hold down to hinge: lower pivot)**	**2**	**1315TILT-3454 ASY**
	L.1 Bolt (lower pivot pin)	2	WBOLT 0.625X1.50 GR8
	L.2 Pin lock spacer (lower pivot pin)……...	2	SPACER-0625-0000
	L.3 Flat Washer (lower pivot pin)	2	WASHER-F 0.625 GR8
[M]	**HYDRAULICS** Parts are not for use if excavator had existing dozer blade. Call excavator manufacturer.		
	M.1 Flow valves (thread #8 NPT)……	2	HV-FLW-D-EF30S
	(If jerking occurs during lowering Hold Down Arm (HDA), install flow valves on hydraulic lines which feed extend side of both cylinders, adjust equally reduce flow to eliminate or reduce this issue.)		
	M.2 Counter balance block (empty block)	2	HV-BLK-S-YEJ-S
	M.3 Counter balance valve (valves for block)	4	HV-CB-S-CBPA20MVS050
	(After cycling the Hold Down Arm a number of times to eliminate air in lines, if Hold Down Arm does not hold it’s positioning, install counter balance valve block with valves in line before each cylinder.)		
	M.4 Pilot valve (see next page)……..……..1		HV-BLK-F-DS70HP-1
[N]	**CYLINDER GUARD** (Only units with SAS hinge F5972 & UP)	**2**	**1902-027**
	N.1 1/2” x 6 1/2” Hex bolt	4	WBOLT 0.500X6.50 GR8
	N.2 1/2” Nyloc nut	4	WNUT 0.500-13-GR8-NY

INSTALLATION: HINGE & HYDRAULICS (PAGE 13)
SAS™ EXTREME™ AUTO PROCESSOR

OPTIONAL: SAS SUPPLIED HINGE, HYDRAULIC DIVERTER BLOCK & CYLINDERS:
INSTALLATION SHOULD BE COMPLETED BY AN EXPERIENCED HEAVY EQUIPMENT MECHANIC
(Installation may impact or void machine OEM warranty, if any)
(Hoses are not included)

DESCRIPTION	QTY	PART NUMBER
M.4 Pilot Operated Selector Valve Block ['Valve']……..	1	HV-BLK-F-DS70HP-A

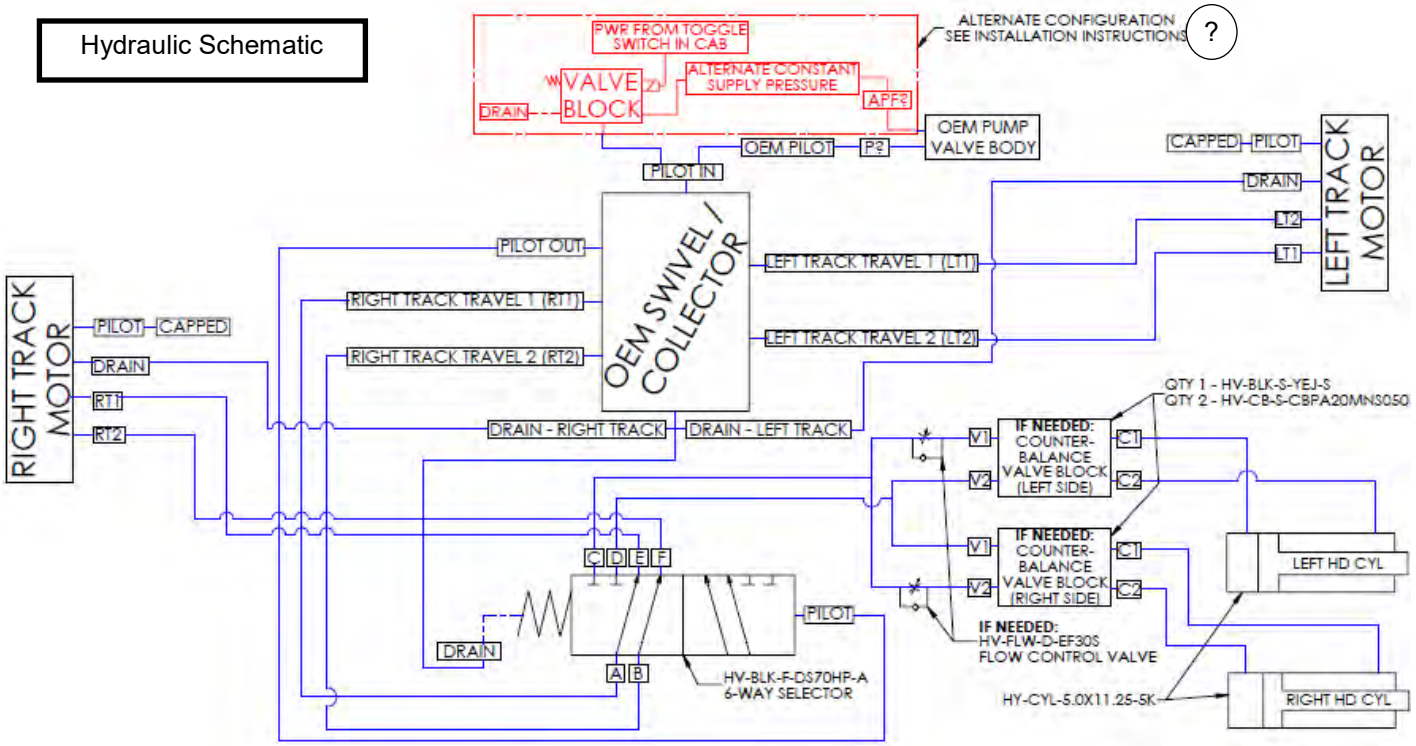
Locate 'Valve' for installation within protected area inside the x-frame belly.
Purpose: Divert fluid from right track to hydraulics to SAS Extreme hold down cylinders.

- Ports A & B are input Into 'Valve' which are pulled downstream of swivel/collector underneath the excavator that would originally route to one drive motors for one of the tracks, SAS has always used the 'right' track hydraulics.
- Ports E & F are then routed to drive motor for right track in standard position.
- The high speed pilot line that originally runs to each the left and the right track drive motors is disconnected from the motors and now only is routed to the pilot port on this 'Valve'. This pilot line is typically the smaller of the two small lines that run through the swivel/collector. This enables the 2nd position of the 'Valve' to function when the 'high speed' function is actuated in the cab of the excavator.
- With pilot line pressurized, ports C & D are now live & will be routed to cylinders to position hold down up/down.
- 'Drain line' is final port on 'Valve', this will be need to be T'd into existing drain line that runs from each track drive motor & back up through the swivel. This line is typically larger of two 'small' lines running through swivel/collector.

? If arm operates as expected, keep OEM pilot source at 'P?' If track unexpectedly moves, cap off OEM pilot at P?, then install Alternate Pilot Feed (APF?), valve, drain & switch to connect to "Pilot In" rather than OEM pilot.

M.5 Valve Block [for Alternative Configuration]……1 HV-BLK-E-AT180585

Hydraulic Schematic

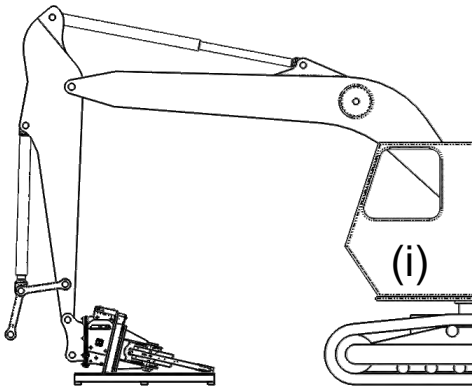


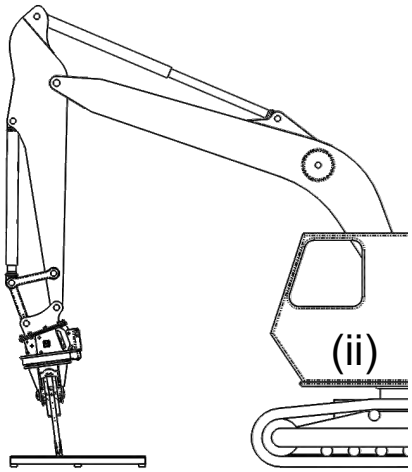
INSTALLATION: HEAD (PAGE 14)
SAS™ EXTREME™ AUTO PROCESSOR

INSTALLATION OF SAS™ EXTREME™ AUTO PROCESSOR HEAD ASSEMBLY:

INSTALLATION SHOULD BE COMPLETED BY AN EXPERIENCED HEAVY EQUIPMENT MECHANIC

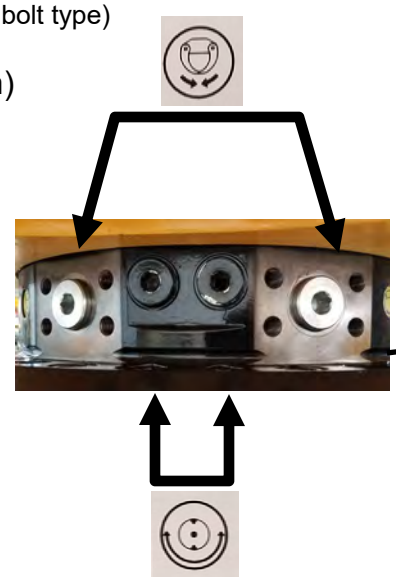
1. Remove existing bucket and inspect pins and bushings. Replace as needed.
2. Line up palletized head assembly & machine. Image (i).
   Note: Head weight approximately:
   Model EX-25 & 35: 1,300 kg (2,850 lb)
3. Lower stick of excavator down to line up with hole at top of assembly and insert and secure pin "A" into head assembly.
4. With pin "A" secure in head assembly, lift assembly so that only the tips of the head assembly are resting on pallet as shown in image (ii). Align curl linkage to other hole in head Assembly mount. Insert & secure pin "B" in head assembly.
5. Connect hydraulic hoses.
   Hose specification 34 Mpa, 344 Bar (5,000 psi) Min. dia. 19 mm 3/4"

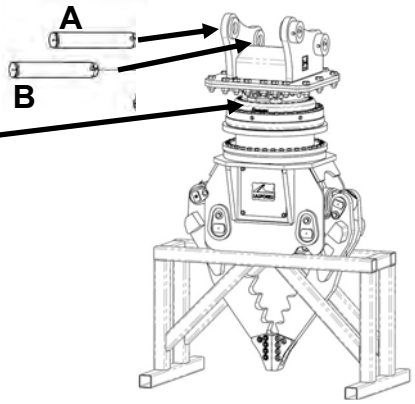




SAS has no responsibility as to performance of excavator's hydraulic system with this attachment.

Jaws (Grapple) connection **(EX: v4 & v5 only)**
- Fittings: #12 BSP (thread in type) /or/ #16 CODE 62 (4 bolt type)
- Flow (Maximum): 130 L/min (35 gpm)
- Pressure (Maximum) 31 MPa, 310 Bar (4,500 psi)





Rotator connection **(EX: v4 & v5 only)**
- Fittings: #8 BSP
- Flow (Maximum) 40 L/min (10 gpm)
- Pressure (Maximum) 25 MPa, 250 Bar (3,600 psi)

AFTER INSTALLATION PRIOR TO OPERATION
1. Grease all pivot points with Head and Hold Down resting on ground and machine engine off.
2. Read excavator manufacturer's manual to identify control levers operation, method to stop motions, safety parameters related to operation of the excavator with any specialized attachment.
3. Stay clear of pinch points. Slowly engaging controls, test all motions of Head Assembly. Watch for interference points and stop further motion if interference occurs.

PREVENTIVE MAINTENANCE (PAGE 15)
SAS™ EXTREME™ TORQUE INTERVALS

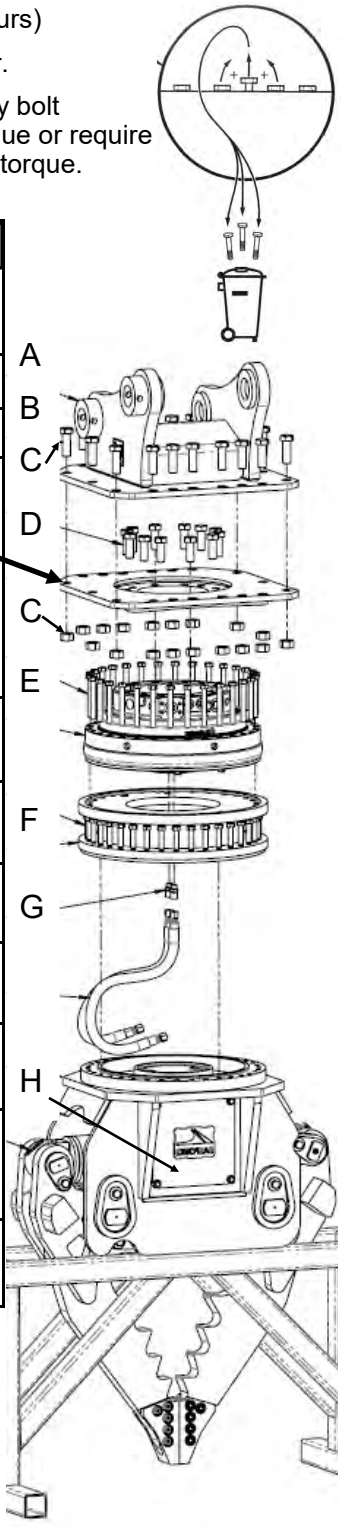
Set attachments on ground, turn off excavator, depressurize hydraulic supply to attachments, stay clear of pinch points during greasing. Safe & proper daily maintenance will help ensure long term performance and prevent failures. Failure to follow preventive maintenance guidelines can result in equipment failure resulting in injury or property damage.

Visual Inspections: Frequency daily pre-operation inspection (or every 10 operating hours)

Re-Torque interval chart: After first 50 hours of operation & every 250 hours thereafter.

Replace Loose Bolt & Bolt on each side: During daily pre-operation inspection if any bolt (specifically Ref. C, D, E, F, G) are found to be more than 80% out of stated tightening torque or require more than 1/4 of turn to obtain required re-torque, install new bolt & adjacent bolts and set torque.

Ref.	Thread	Location	# Bolts	Torque Spec	Wrench Size	Hour Interval			
						10	50	Every 250	12000 replace bolts
A	Metric	Hoses to stick	4	70-78 ft-lb	1 - 3/8”				
B		Pins	2	Per OEM					
C	SAE	Stick mount to stick adaptor (Prior to s/n: F5909) Adaptor plate not used s/n F5909 & higher.	18	500 ft-lb	1 - 1/2”				
D	Metric	Stick adaptor to rotator (v4 & v5)	12	580 ft-lb	Metric 36 mm				
Prior to s/n:F5908 Bolts hidden location under stick mount. Remove stick mount to inspect annually. s/n F5909 & higher Bolts are open and visible on top of stick mount.									
E	SAE	Rotator lower mount	30	160 ft-lb	15/16”				
F	SAE	Lower adaptor to clamp body (v4 only) Lower adaptor plate only in s/n F5692-F5717. Not s/n F5712	36	160 ft-lb	15/16”				
G		Cylinder hoses & fittings	4 fitgs	50 ft-lb	30mm: 1-3/16”				
H	SAE	Cylinder service cover	4 & 4	Hand tighten	9/16”				
I	SAE	Bolts, clip & pin (head)	5	Hand tighten	15/16”				
J	SAE	Claw tips bolts	10	160 ft-lb	3/8” HEX & 15/16 Socket				
K	SAE	Hold down bolts & pins	4	Hand tighten	9/16”				



Replace all bolts every 12,000 hours: Specifically Ref. C, D, E, F
Apply Blue Loctite 243 to bolts Ref. C, D, E, F when replacing.

PREVENTIVE MAINTENANCE (PAGE 16)
SAS™ EXTREME™ GREASING

Place grapple on firm level surface, turn off machine & avoid pinch points.

Lubricating rotating grapple head (For models: SAS EXTREME EX-25 v4 & v5, EX30 & EX35)
Lubricate the SAS EXTREME Auto Processor rotating grapple head daily. Use this opportunity to closely inspect the pins and pin retaining hardware and conduct necessary repairs.

Recommended grease for Raceway

Brand	Raceway Grease
Mobil 1/14/2019 Indexator 2014 Service InfoSheet	Mobilux EP2
Shell	Gadus S2 V220 2
Castrol	Spheerol EPL2

Lubrication interval chart

Indexator XR600	Raceway
Quantity of nipples	6 nipples
Every 40 hours*	Apply to all nipples to obtain even amount of grease appearing around entire bearing seal

Recommended grease for Pins

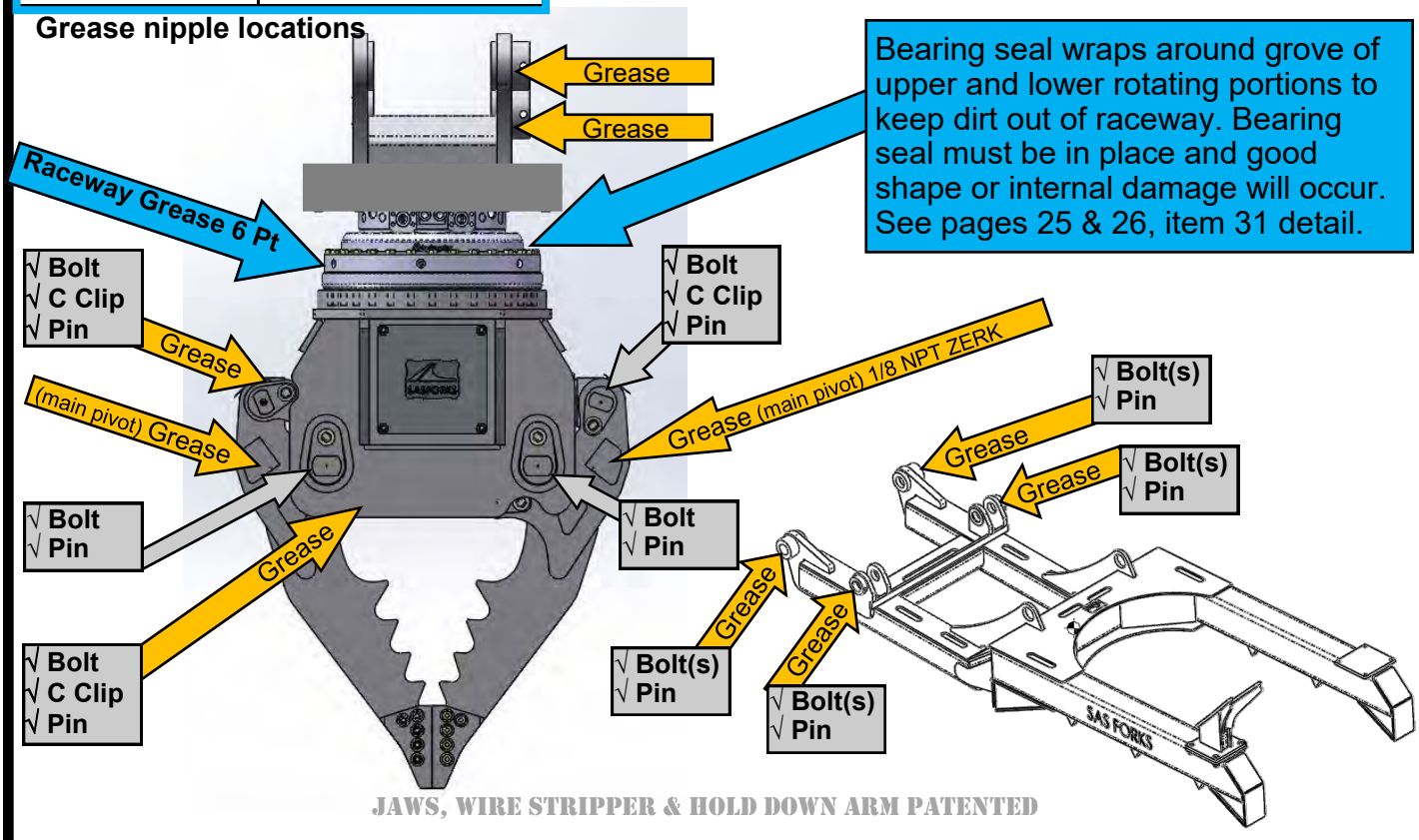
Brand	Pin Grease
Mobil (11/4/2016 Per Eric @ Harlon Oil)	Centaur Moly EP2
Mobil	Mobilegrease CM-P
Comparable	Comparable

EXTREME head	Grapple Pins
Quantity of nipples	5 nipples
Every 10 hours*	4 pumps
Every 40 hours*	4 pumps

EXTREME hold down	Pivot Pins
Quantity of nipples	4 nipples
Every 10 hours*	2 pumps
Every 40 hours*	4 pumps

*operating hours

Grease nipple locations



Bearing seal wraps around grove of upper and lower rotating portions to keep dirt out of raceway. Bearing seal must be in place and good shape or internal damage will occur. See pages 25 & 26, item 31 detail.

PRE-OPERATION CHECKLIST (PAGE 17)
SAS™ EXTREME™ AUTO PROCESSOR

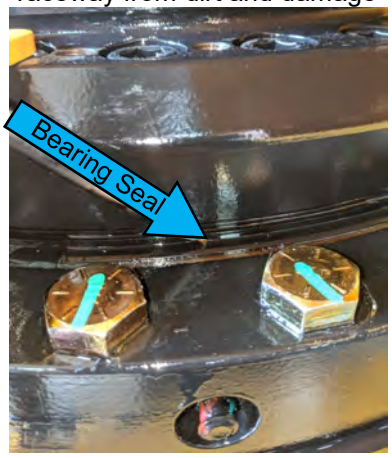
READ & FOLLOW SAFETY INFORMATION IN ORIGINAL EXCAVATOR MANUFACTURER'S OPERATOR, SAFETY AND SERVICE MANUALS. This checklist is limited to pre-operations inspection focused on Extreme Head and Hold Down Arm assemblies (HDA). Additional inspection points will be recommended in the excavator manufacturer manuals.

⚠WARNING Failure to follow instructions and precautions in excavator manufacturer's manuals and this manual can result in serious damage to equipment and/or result in injury or death.

Use caution while inspecting. Be aware of and avoid:
- Pinch points
- High pressure hydraulic fluids or stored energy
- Location of other individuals in work area

Prior to conducting inspection;
- Park excavator on firm level ground
- Lower Head & Hold Down Assemblies to firm level ground
- Excavator engine must be turned 'off'
- Wear personal protective equipment, (safety glasses & gloves)

Bearing Seal Close Up: Protects raceway from dirt and damage

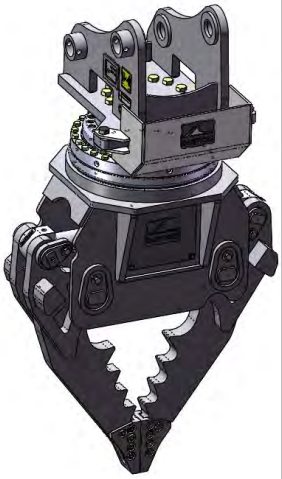


EXTREME AUTO PROCESSOR ATTACHMENT INSPECTION POINTS:

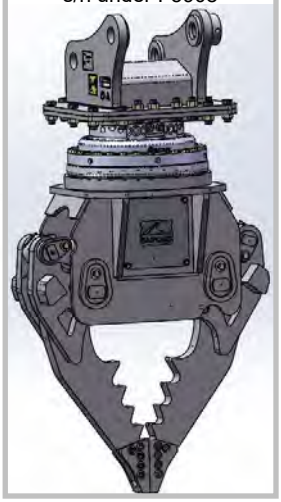
Head to stick fastening pins [***See Torque Interval page***]
- Bolts stick mount to rotator.
- Pins for properly secured
- Stick mount for cracks

Rotator
- Rectangular hose guard secure (Pg 24, Item S.3)
- Curved bearing seal guard secure (Pg 24, item U.2)
- Bolts rotator to clamp body
- Bearing seal (keeps dirt out of raceway) See Close up.
- Rotator for cracks
- Leaks or damage on hoses.

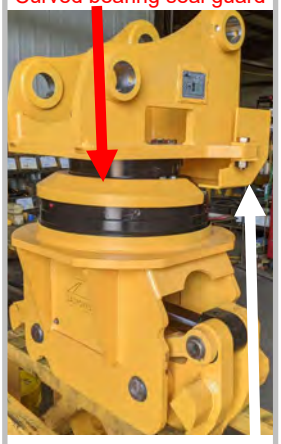
Single direct stick mount s/n F5909 & up



Stick mount & stick adaptor s/n under F5908



Curved bearing seal guard



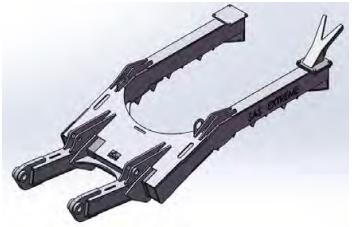
Rectangle hose guard

Clamp body
- Damaged pins, pin retention hardware or misaligned pins
- Clamp body for cracks

Claws & tips
- Claws for cracks
- Claw tip bolts

Hold Down Assembly (HDA)
- All pins properly secured
- Structure cracks
- Wire stripper bolts secure

Excavator x-frame inspection
- Look from bottom up & or cracks around hinges



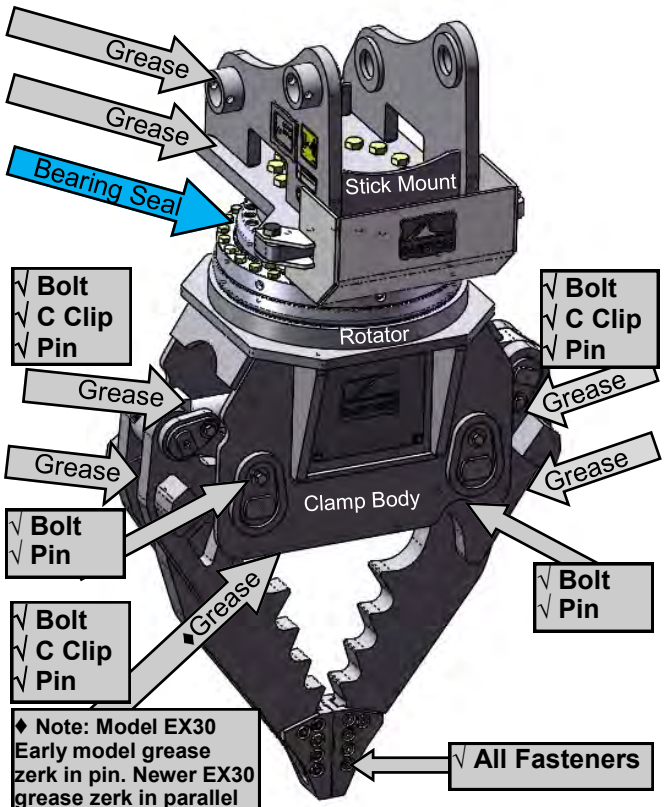
Operator cab verify safety equipment in place:
- Roll Over Protection System
- Safety glass windshield in place
- Exterior steel guard over front windshield to protect operator.

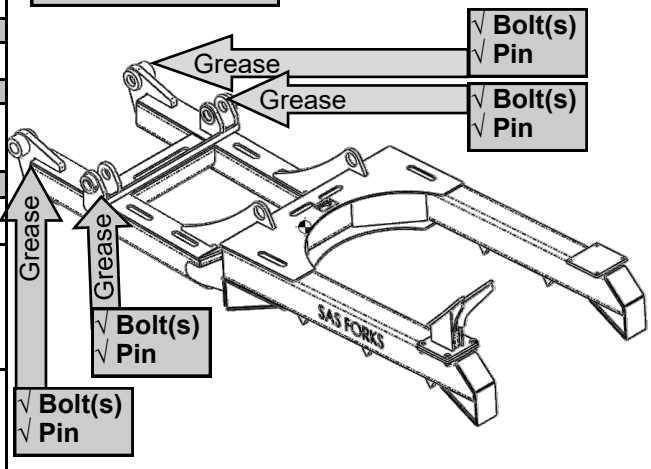
⚠ Lock out/tag out excavator if defects present. Authorized mechanic must complete repairs before operation.

DAILY PRE-OPERATION CHECKLIST (PAGE 18)
SAS™ EXTREME™ AUTO PROCESSOR

Set attachments on ground, turn off excavator, depressurize hydraulic supply to attachments, stay clear of pinch points during greasing. Safe & proper daily maintenance will help ensure long term performance and prevent failures. Failure to follow preventive maintenance guidelines can result in equipment failure resulting in injury or property damage.

Item	√	√	√	√	√	√	√	√	√	√
Stick pin & bolt										
Stick pin & bolt										
Stick mount bolts										
Stick mount cracks										
All Rotator bolts										
Bearing Seal: see Pg 25 & 26, Item 31										
Rotator cracks										
R-Cyl bolt, clip, pin										
L-Cyl bolt, clip, pin										
Main pivot grease										
Main pivot grease										
Main pivot pin, bolt										
Main pivot pin, bolt										
Clamp body cracks										
Parallel bar pin♦, bolt, clip										
R-Claw tip bolts										
L-Claw tip bolts										
Claw cracks										
Hold arm bolt, pin										
Hold arm bolt, pin										
Hold arm cracks										
Wire stripper bolts										
Machine x-frame Structural cracks										
Regularly rotate for fresh fluid to rotator. See page 21										
Date										
Machine hours										
Inspection by:										





JAWS, JAW TIPS, WIRE STRIPPER & HOLD DOWN ARM PATENTED

DETERMINING LIFT CAPACITY (PAGE 19)
SAS™ EXTREME™ AUTO PROCESSOR

READ & FOLLOW SAFETY INFORMATION IN ORIGINAL EXCAVATOR MANUFACTURER'S OPERATOR, SAFETY AND SERVICE MANUALS.

Excavator will handle loads differently than with the original dozer blade & bucket.

The purpose of this document is to describe t**method of** load rating and operating limitation **parameters** of Extreme auto processor as indicated on operating data plate of device.
On this product, SAS Forks installs a data plate on the product which specifies ;

- Product model
- Product serial number
- Product weight
- Product production date

■ Notice to refer to Excavator OEM positional lift chart and make appropriate reductions in permissible lift capacities to offset any differential in the original rated attachment, if any, and the weight of the Product, the Extreme Head Assembly.

It is important to note that the actual load (lift) ratings of the product are impacted by multiple factors in which the operator is responsible to take into account and to reduce the weight of any potential item to lift, to ensure machine remains stable, and does not tip. The below items are not a comprehensive list, but these complex work variables must be taken into account by the operator to ensure safe operation;

■ ***Ground or working surface stability***
■ ***More unsafe: soft, unpredictable or variable surface compaction /vs/***
■ ***More safe: solid surface***

■ ***Positioning of excavator on such working surface***
■ ***More unsafe: angled and tilted /vs/***
■ ***More safe: flat & level***

■ ***Proximity in which excavator is to work and materials to be lifted.***
■ ***More unsafe: Extending lift arms and lifting /vs/***
■ ***More safe: working close with minimum reach***

■ ***Lowering and engagement of outriggers to working surface***
■ ***More unsafe: Outriggers removed and/or not engaged to ground /vs/***
■ ***More safe; Outriggers lowered fully and engaged with solid working surface.***

■ ***Amount of hydraulic pressure operator allocates to the grapple of the Extreme product***
■ ***More unsafe: Operator not providing sufficient hydraulic pressure to engage object lifted /vs/***
■ ***More safe: Operator engages excavator's hydraulic system to ensure secure grappling.***

■ ***Lift capacity limitation of excavator, based on excavator's OEM lift capacity chart***
■ ***More unsafe: Not understanding parameters and assumes within excavator's OEM chart /vs/***
■ ***More safe: Clearly understand excavator's OEM load chart, product weight, & parameters.***

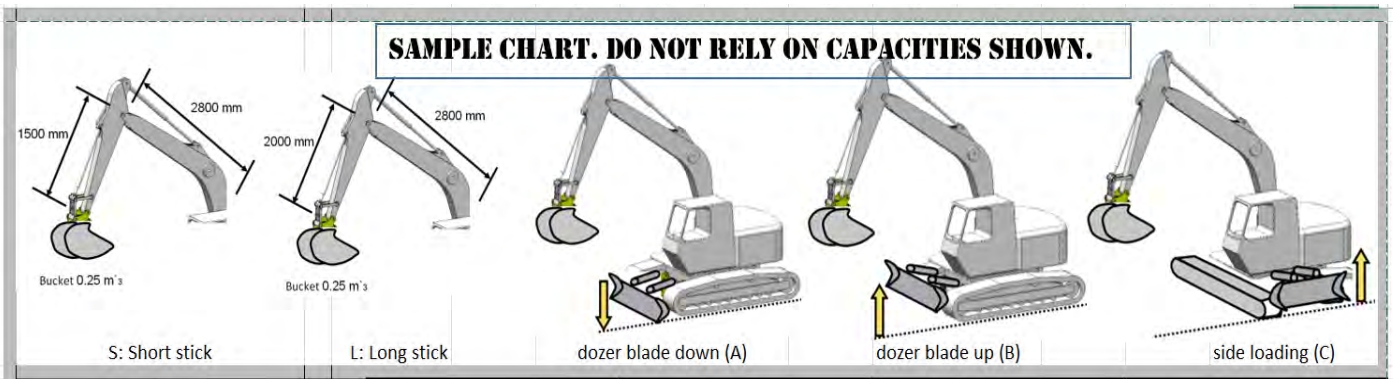
■ ***Strength and durability of the item being lifted. (This product is meant only to lift scrap metal, never lift any good resalable product. Never lift any persons or any device holding any persons.***
■ ***Prohibited & dangerous: Attempting to lift persons in any manner will result in injury or death.***
■ ***More unsafe: Lifting items in such a manner that may rip or separate /vs/***
■ ***More safe: Grapple items on heavy surface that provides a secure grip with Extreme grapple.***

DETERMINING LIFT CAPACITY (PAGE 20)
SAS™ EXTREME™ AUTO PROCESSOR

Establishing Load Ratings
The structure of the Extreme auto processor grapple head attachment is designed to lift a load that meets or exceeds the excavator's boom lift capacity, when hydraulic pressure of between 80% and 100% of maximum pressure per the label on Extreme grapple head attachment is supplied by the excavator, the Extreme's grapple mechanism to adequately engage the item lifted.

The lift limitations set forth by the excavator OEM (Original Equipment Manufacturer) must be reviewed and understood by the operator. The excavator OEM operator manual or in cab label is expected to provide a chart with lifting capacities at a variety of lift positions, **in accordance with ISO 10567:2007** The operator must apply the weight of the Extreme grapple head assembly and interpret the excavator OEM chart whereas the position of the dozer blade or stabilizers are considered to be off the ground to determine the permissible load.

Sample chart. This chart does not contain any valid lift capacities for any excavator equipped with an Extreme auto processor attachment.



R: Reach / H: Height			R: 2.0 m			R: 3.0 m			R: 4.0 m			R: MAX		
			dz dwn	dzr up	side	dz dwn	dzr up	side	dz dwn	dzr up	side	dz dwn	dzr up	side
H: 3.0 m	kg	S							800	800	800	750	700	600
H: 3.0 m	kg	L							700	700	700	800	600	550
H: 2.0 m	kg	S				1400	1200	1200	1100	1000	900		600	500
H: 2.0 m	kg	L				1200	1100	1000	900	800			600	450
H: 1.0 m	kg	S				2300	1500	1300	1800				600	400
H: 1.0 m	kg	L				2000	1500	1300					600	450
H: 0.0 m	kg	S				2500						1100	600	500
H: 0.0 m	kg	L				2400					800	900	700	550
H:-1.0 m	kg	S	3800	3400	2800	2400			1600	900	775	1300	800	600
H:-1.0 m	kg	L	2900	2800	2600	2300		1100	1600	1000	750	1100	700	650
H:-2.0 m	kg	S	3000	3000	2400	2100	1400	1000	1500	1100	725	1400	1100	650
H:-2.0 m	kg	L	2800	2500	2200	1900	1300	900	1400	1000	700	1200	800	600

In accordance with typical excavator OEM lifting charts, with general reference to sample chart above, positions that effectively reduce the load threshold at which tipping occurs, include:

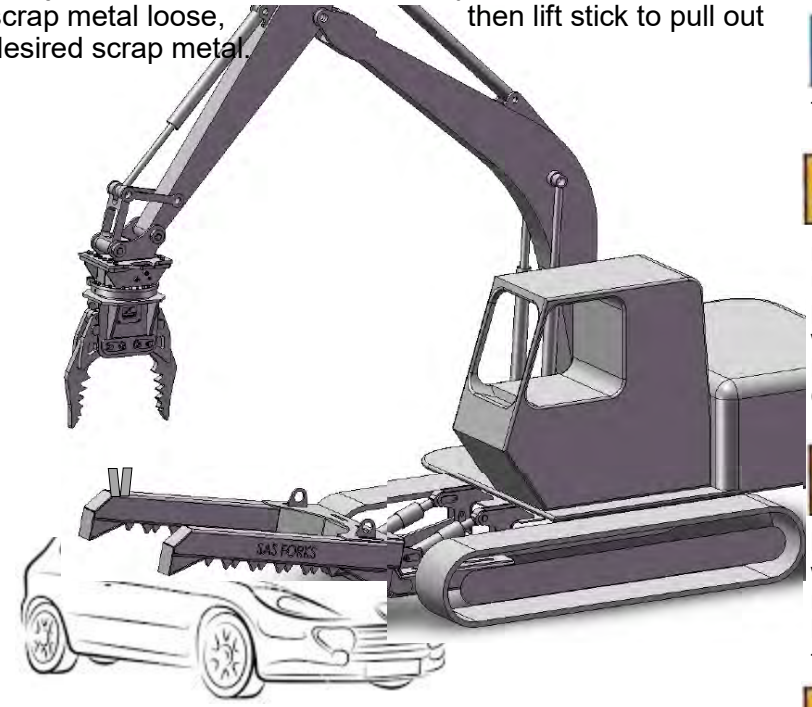
- Lifting dozer blade, downriggers or Extreme hold down arm, as shown in sample illustration (B) or (C).
- Turning of excavator's cab across tracks or wheels with the dozer up, shown in sample illustration (C).
- Extending the reach of the boom and stick.

Operator must identify load chart for specific excavator, not included herein, and use limits per the chart which specifies 'dozer up and side lift' or 'outriggers up and side lift', and subtract weight of Extreme grapple head assembly, to identify the net lift capacity permissible.

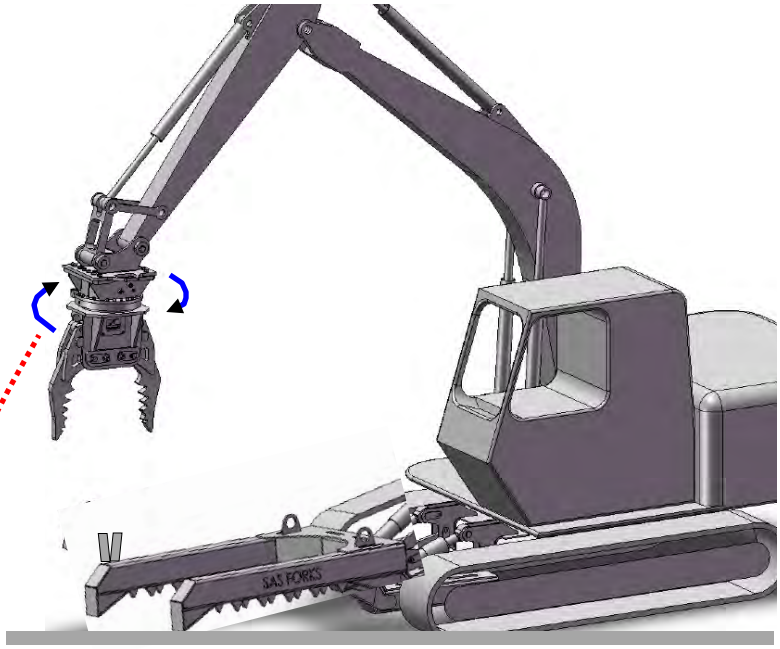
OPERATION GUIDE (PAGE 21)
SAS™ EXTREME™ AUTO PROCESSOR

FOLLOW SAFETY INFORMATION IN EXCAVATOR MANUFACTURER OPERATOR MANUAL.

Be cautious, as working load capacities are determined. Secure car down with Hold Down Arm. Grasp scrap metal with jaws, use stick breakout force cylinder power to break scrap metal loose, then lift stick to pull out desired scrap metal.



Lower Hold Down Arm against car or ground prior to rotating cab.



Multiple times during work day, complete several full rotations to circulate fresh fluid from tank to rotator.

NOTICE **Minimize down force applied** when restraining car. Avoid pushing down to extent that front of excavator is lifted and suspended. Excess stress can cause x-frame failure. Hold down arm swaying or reduced lift height may indicate x-frame damage. Stop use immediately.

NOTICE **Move controls slowly,** not jerking machine. Rough or jerking motions may cause damage to machine or Extreme

⚠WARNING Tip over & crush risk. Extreme Grapple Head Assembly may weigh more than original bucket which excavator manufacturer installed, thus reducing potential lift capacity. Lifting excess weight may cause tip over, damage, injury or death. **Wear seat belt and Operate to maintain safe stability.**

⚠WARNING Tip over & crush risk. **Wear seat belt**. Rotating machine with hold down arm or out-riggers not in firm contact with ground or traveling with an elevated load, may **cause machine to tip over**. For best stability prior to rotating cab, lower hold down arm to ground or on top of car.

⚠WARNING Electrocution and crush risk if contact made with electric power lines or building structure. **Avoid contact.**

⚠WARNING Electric & Hybrid—High Voltage battery equipped vehicles pose electrocution, explosion & fire hazards. Identify these vehicles clearly. **Do not use SAS EXTREME grapple jaws to remove, impact or damage battery assemblies**.

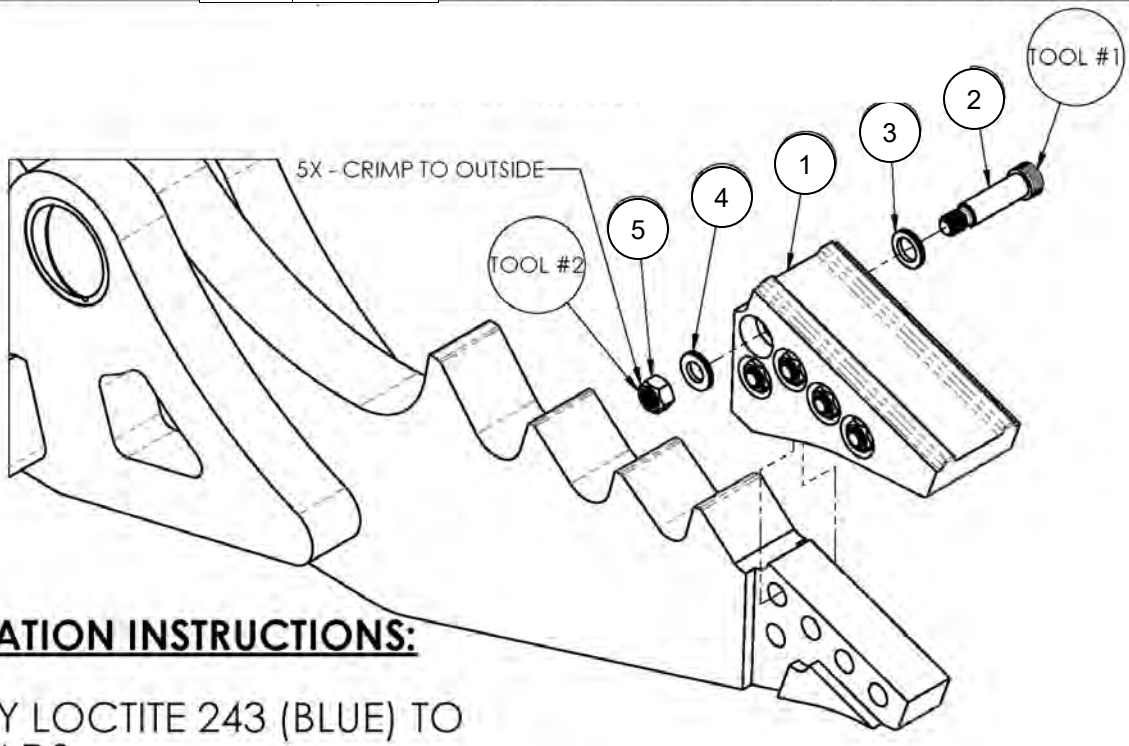
NOTICE Head, claw & wire stripper impact will cause damage. Avoid contact.

⚠WARNING Risk of claw contact to cab, damage & or injury to operator if operator curls boom, stick, & jaws in tightly toward cab. Do not fully curl boom, stick, jaws in.

NOTICE **Avoid overheating** of hydraulic fluid in rotator by engaging rotate function and allowing head to rotate several full rotations to **circulate fresh fluid from tank to rotator,** occasionally during day.

PARTS DIAGRAM (PAGE 22)
SAS™ EXTREME™ AUTO PROCESSOR
FITS ALL EX CLAWS W/REPLACEABLE TIPS

ITEM NO.	DESCRIPTION	Quantity One Tip	Quantity Two Tips Req.Tip-1 & Tip-2	WEIGHT	SAS PART NUMBER	NOTES
1	REPLACABLE CLAW TIP	1	2	12.802	EP-EXC-CLAW-TIP-2-V3	ONE RIDGE P# IS EP-EXC-CLAW-TIP-1-V3
2	SHOULDER BOLT	5	10	0.430	WBOLT 0.750X2.25 SLD	INCLUDED IN EP-EXC-CLAW-TFAST-V3
3	3/4" LOCK WASHER	5	10	0.03	WASHER-L 0.750 NORD	INCLUDED IN EP-EXC-CLAW-TFAST-V3
4	5/8" LOCK WASHER	5	10	0.03	WASHER-L 0.625 NORD	INCLUDED IN EP-EXC-CLAW-TFAST-V3
5	CRIMP LOCK NUT	5	10	0.08	WNUT 0.625-11-GR8-CONE	INCLUDED IN EP-EXC-CLAW-TFAST-V3



INSTALLATION INSTRUCTIONS:

1. APPLY LOCTITE 243 (BLUE) TO THREADS
2. TORQUE DOWN (5) BOLT HEADS & NUTS TO ***160 FT-LBS***

TOOL #	TOOL	SIZE	QTY	TO BE USED
1	HEX DRIVER	3/8"	1	INSTALLING SHOULDER BOLT
2	SOCKET DRIVER	15/16"	1	INSTALLING CRIMPED NUT

PATENTED JAWS & JAW TIPS.

⚠WARNING Pinch points will cause serve injury. Stay clear of pinch points at all times. Only an authorized and experienced person should perform this work.

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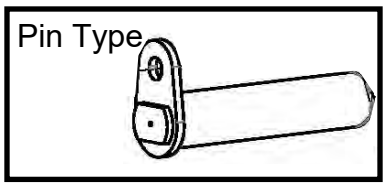
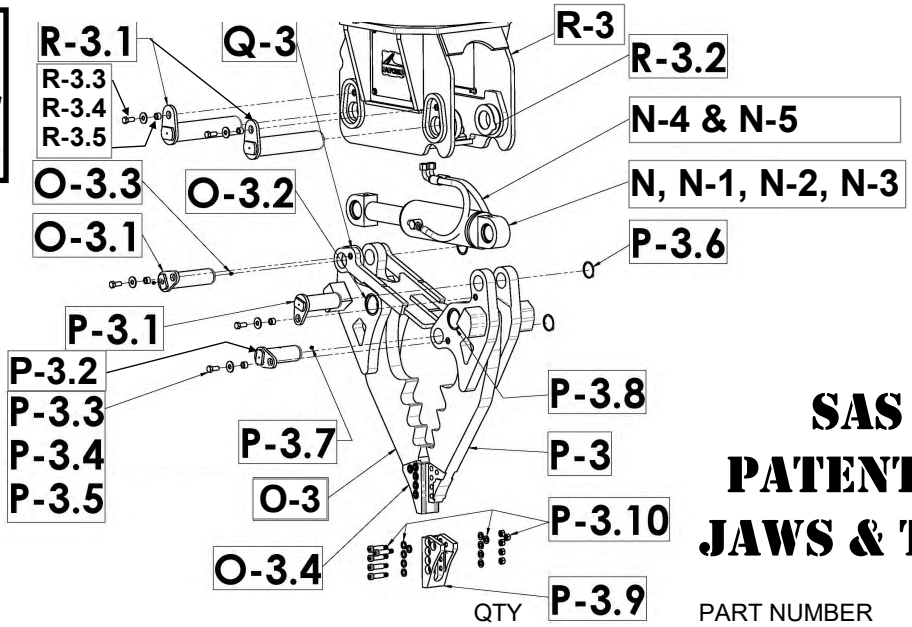
EX-25 PARTS DIAGRAM (PAGE 23)
SAS™ EXTREME™ AUTO PROCESSOR
15-26 TON EX-25 SERIAL NUMBER F5343 & UP





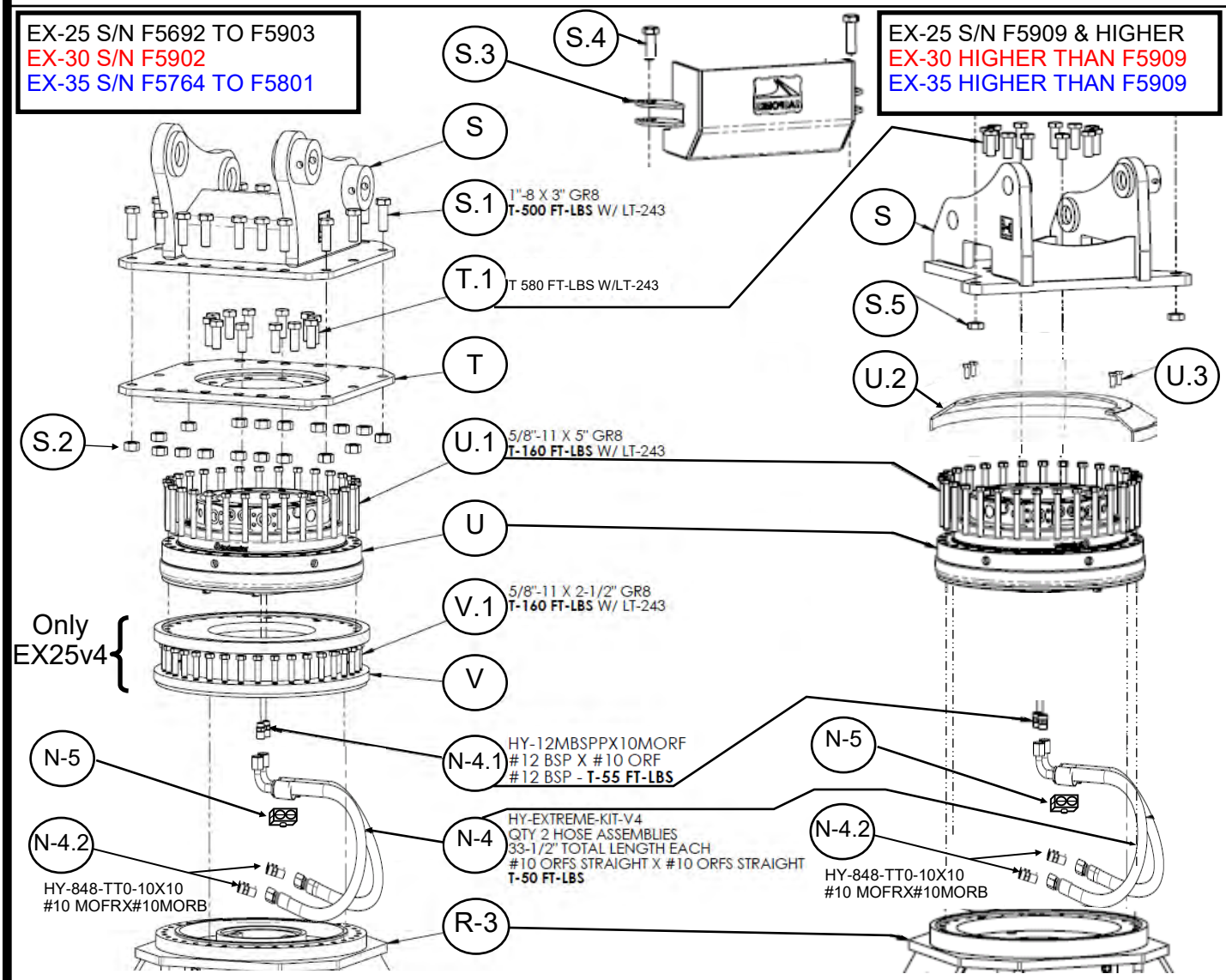
SAS PATENTED JAWS & TIPS

DESCRIPTION		QTY	PART NUMBER
[N] CLAW CYLINDER		**1**	**HY-CYL-5.0X11.25-5K**
CYLINDER COMPONENTS (IDENTIFY CYLINDER STAMP TO SELECT CORRECT PARTS)			
BM:	Cyl stamp includes…. BM….N-1 CYL SEAL KIT……	1	HK-5.00-783-244
	Cyl stamp includes…. BM….N-2 CYL PIN BUSHING	2	W-B2.500X3.000X2.000
	Cyl stamp includes…. BM….N-3 CYL PIN GREASE SEAL..	2	W-WIPER-2.5X3.0
RR:	Cyl stamp includes…. RR….N-1 CYL SEAL KIT	1	HK-5.00-732703
	Cyl stamp includes…. RR….N-2 CYL PIN BUSHING	2	W-B2.505x3.002x2.00
	Cyl stamp includes…. RR….N-3 CYL PIN GREASE SEAL	2	W-WIPER-2.5X3.0
N-4	HOSE KIT - EX25v4 only EXTEND & RETRACT HOSES	1	HY-EXTREME-KIT-V4
	- EX25v5 (& V3) EXTEND & RETRACT HOSES…..1		HY-EXTREME-KIT
N-4.1	FITTING w/O-rings BETWEEN HOSE & ROTATOR (w/hose kit)	2	HY-12MBSPPX10MORF
N-4.2	FITTING w/O-rings BETWEEN HOSE & CYLINDER (w/hose kit)	2	HY-848-TTO-10X10
N-5	HOSE CLAMP-HOLDS HOSES UNDER ROTATOR	1	HY-CLAMP-1.10-2 HOSE
[O-3] CLAW ASSEMBLY W/TIP (FASTENED W/2 PINS: R-3.1, O-3.1)		**1**	**EP-EX25-CLAW-LH-V3-3**
O-3.1	PIN (CONNECTS CYLINDER ROD END TO CLAW) LH	1	1902-004-V3 ASY
O-3.2	BUSHING (1 REQ'D FOR EACH CLAW PIVOT PIN)..	1	W-B3.002X3.505X6.437
O-3.3	GREASE ZERK (INSIDE BOTH ENDS OF PIN "0-3.1")	2	WGREASE ZERK 1/4-28
O-3.4	REPLACEABLE CLAW TIP WITH 2 RIDGES……	1	EP-EXC-CLAW-TIP-2-V3
[P-3] CLAW ASSEMBLY W/TIP (FASTENED W/3 PINS: R-3.1, P-3.1, P-3.2)		**1**	**EP-EX25-CLAW-RH-V3-3**
P-3.1	PIN (CONNECTS CYLINDER BASE END TO CLAW) RH	1	1902-007-V3 ASY
P-3.2	PIN-PARALLEL BAR PIN - RH……..……..	1	1902-008-V3 ASY
P-3.3	RETAINER BOLT FOR PINS	5	WBOLT 0.625X1.50 GR8
P-3.4	WASHER RETAINER BOLT……	5	WASHER-F 0.625 GR8
P-3.5	PIN-LOCK SPACER	5	SPACER-0625-0000
P-3.6	C-CLIP RING……..	3	MCC-98410A231
P-3.7	GREASE ZERK (INSIDE END OF PIN "P-3.2")	1	WGREASE ZERK 1/4-28
P-3.8	BUSHING (1 Required for each claw pivot pin)	1	W-B3.002X3.505X6.437
P-3.9	REPLACEABLE CLAW TIP WITH 1 RIDGE…….....	1	EP-EXC-CLAW-TIP-1-V3
P-3.10	TIP FASTENERS - QTY 5 PER TIP - QTY 10 TOTAL (3/4" X 2-1/4" SHOULDER BOLT, 3/4" WASHER, 5/8" WASHER & 5/8" LOCK NUT)	10	EP-EXC-CLAW-TFAST-V3
[Q-3] PARALLEL BAR (s/n F5343 & Higher)		**1**	**EP-EX25-PBR-V31**
[R-3] CLAMP BODY	EX25 s/n F5720 & higher (include F5712)	1	EP-EX25-CBY-V5
	EX25 s/n F5703 & earlier (include F5713, F5717)	1	EP-EX25-CBY-V3
R-3.1	PIN-MAIN CLAW PIVOT PIN	2	1901-011-V3-ASY
R-3.2	3" ID SHIM X 0.09375" THICK……	4	W-SC-SHIM-.094
R-3.3	BOLT TO RETAIN MAIN CLAW PIVOT PIN	2	W BOLT 0.625X1.50 GR8
R-3.4	FLAT WASHER……	2	WASHER-F 0.625
R-3.5	PIN LOCK SPACER	2	SPACER 0625-000

EX-25, EX-30 & EX-35 PARTS (PAGE 24)
SAS™ EXTREME™ AUTO PROCESSOR
HEAD & ROTATING PARTS

EX-25 S/N F5692 TO F5903
EX-30 S/N F5902
EX-35 S/N F5764 TO F5801

EX-25 S/N F5909 & HIGHER
EX-30 HIGHER THAN F5909
EX-35 HIGHER THAN F5909

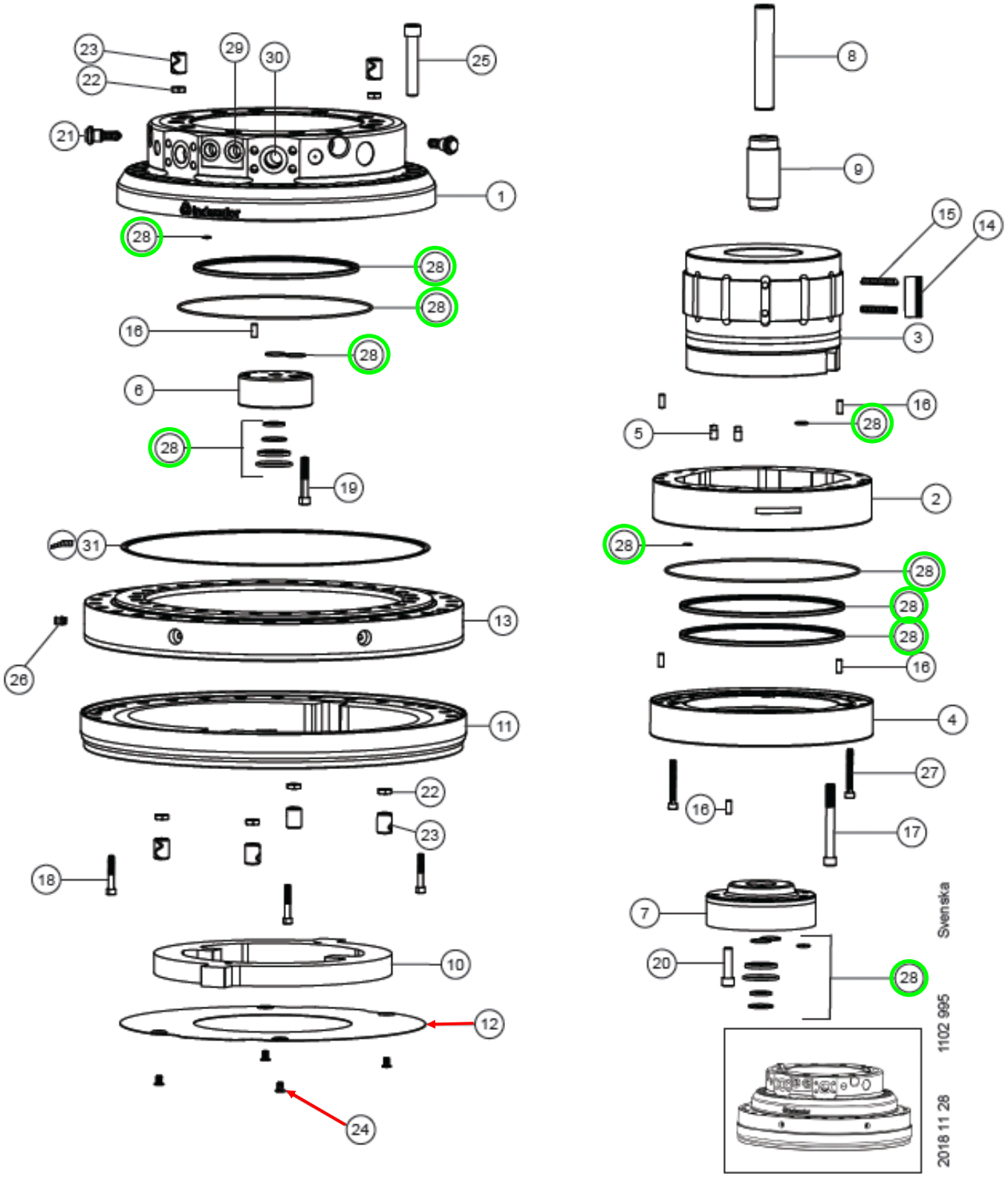


DESCRIPTION		QTY	PART NUMBER
[S] STICK MOUNT		**1**	**EP-EX25-STK...BY MACHINE**
S.1	s/n F5692-F5903 only: BOLTS for stick mount,1"-8 X 3" GR8	18	WBOLT 1.00X03.00 GR8
S.2	s/n F5992-F5903 only: NUTS FOR STICK MOUNT	18	WNUT 1.000-8 GR8
S.3	HOSE GUARD	1	1901-065
S.4	HOSE GUARD BOLTS	2	WBOLT 1.00X03.50 GR8
S.5	HOSE GUARD NUTS	2	WNUT 1.000-8 GR8
[T]	ADAPTOR (between stick mount & rotator s/n F5692-F5903 only)	1	EP-EX25-STK-INADPTR
T.1	s/n F5692-F5903 only: BOLTS ADAPTOR TO ROTATOR	12	WBOLT M24-3.0X65MM
	●s/n F5692-F5903 BOLTS ARE HIDDEN, MUST UNCOVER TO RETORQUE●		
T.1	s/n F5909 & higher: BOLTS STICK MOUNT TO ROTATOR	12	WBOLT M24-3.0X80MM
[U] ROTATOR XR600		**1**	**HR-ROTAR-N-XR600**
	EX25-v4 & v5 #F5692&up;EX30 #F5902&up;EX35-v3 #F5764&up		
U.1	BOLTS ROTATOR TO LOWER MOUNT 5/8"-11 X 5" GR8	30	WBOLT 0.625x5.00 GR8
U.2	CURVED STEEL PLATE *BEARING SEAL* GUARD (new 3/2021)	1	1901-079
U.3	BOLTS FOR *BEARING SEAL* GUARD (M12-1.75MM X 30 MM)	4	WBOLT M12-1.75X30MM
	RE-TORQUE 69 FT-LBS (LOCTITE LT-243)		
[V] CLAMP BODY ADAPTOR v4 (ONLY S/N F5692-F5717) (exclude F5712)		**1**	**EP-EX25-CBY-ROTIND**
V.1	BOLTS CLAMP BODY ADAPTOR 5/8"-11 X 2-1/2" GR8	36	WBOLT 0.625X2.50 GR8

SEE TORQUE SPECIFICATIONS, REQUIRED RE-TORQUE INTERVALS, & BOLT REPLACEMENT INTERVALS ON PAGE 15.

ROTATOR XR600 PARTS (PAGE 25)
SAS™ EXTREME™ AUTO PROCESSOR
EX-25 #F5692 & UP, EX-30 #F5902 & UP & EX-35 v3 #F5764 & UP

Rotator Model: XR600



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ROTATOR XR600 PARTS (PAGE 26)
SAS™ EXTREME™ AUTO PROCESSOR
EX-25 #F5692 & UP, EX-30 #F5902 & UP & EX-35 v3 #F5764 & UP

Rotator Model: XR600

Item #	SAS Part Number	Description		Qty	Notes:
	HR-ROTAR-i-XR600	**Rotator XR 600 C Complete**		1	
1	HR-N-8100233R	Stator plate upper	Special Order	1	C Incl. pos 21, 29, 30
2	HR-N-8100222	Stator frame	Special Order	1	C
3	HR-N-8100225	Rotator shaft	Special Order	1	C
4	HR-N-8100223	Stator plate lower	Special Order	1	C
5	HR-N-8100054	Restrictors	Special Order	2	
6	HR-N-8100078	Block upper	Special Order	1	
7	HR-N-8100227	Block lower	Special Order	1	C
8	HR-N-8100084	Internal tube	Special Order	1	
9	HR-N-8100053	Outer tube	Special Order	1	
10	HR-N-8100099	Transmission	Special Order	1	
11	HR-N-8100213R	Lower link	Special Order	1	
12	See options below a or b	Bottom plate			
12.a	**HR-N-8100-093-REPL**	**Replacement thick Bottom plate Extreme s/n SAS F5692-F6236**	**Per 8/10/21 Tech Service Bulletin**	**1**	**Requires 24.a & 24.c**
12.b	HR-N-8100-093	Standard Bottom plate Extreme s/n SAS F6252 & higher	Special Order	1	
13	HR-N-8100167R	Slewing bearing	Special Order	1	Incl. pos. 26, 31
14	HR-N-8000337	Vane	Special Order	12	
15	HR-N-5006030	Spring	Special Order	24	
16	HR-N-1019900	Solid pin 8x20	Special Order	6	
17	HR-N-1010677	Screw M12x110	Special Order	20	Torque 120 Nm
18	HR-N-1078179	Screw M8x50	Special Order	3	Torque 33 Nm
19	HR-N-1074541	Screw M10x60	Special Order	9	Torque 60 Nm
20	HR-N-1014950	Screw M12x45	Special Order	5	Torque 120 Nm
21	HR-N-6002565R	Relief valve 28 MPa (R, R)	Special Order	2	Torque 40 Nm
22	HR-N-1074574	Nut M12	Special Order	6	
23	HR-N-1066851	Tubular pin 22x30	Special Order	6	
24	See options below a or b	Bolts to hold Bottom plate			
24.a	**WBOLT M08-1.25X25MM**	**Replacement bolt for thick plate Extreme s/n SAS F5692-F6236**	**Per 8/10/21 Tech Service Bulletin**	**4**	**Requires 12.a & 24.c**
24.b	HR-N-1070556	Standard Bottom plate Screw M8x12 s/n SAS F6252 & higher	Special Order	4	
24.c	**WASHER-L M8-.313NORD**	**Replacement washers thick plate Extreme s/n SAS F5692-F6236**	**Per 8/10/21 Tech Service Bulletin**	**4**	**Requires 12.a & 24.a**
25	HR-N-1008069	Screw M16x90	Special Order	30	Torque 333 Nm
26	HR-N-1018258	Grease nipple M8x1	Special Order	6	
27	HR-N-1070861	Screw M8x65	Special Order	2	Torque 33 Nm
28	HR-N-6002-466	**Seal kit** XR500 C/XR600 C		1	
29	HR-N-5001384	Plug ED G1/2	Special Order	2	
30	HR-N-5001385	Plug ED G3/4	Special Order	2	
31	HR-N-6005-178-KIT	**Bearing Seal** XR 600		1	Package includes two seals, install matching seal, discard extra seal

WIRE STRIPPER

DESCRIPTION			PART NUMBER
[A] WIRE STRIPPER			EP-EXC-WIRE-STRIP-1
[B] FASTENERS			
BOLTS	Qty 4		WBOLT 0.750X3.00 GR8
NUTS	Qty 4		WNUT 0.750-10-GR8-NY

PATENTED
WIRE STRIPPER
U.S.A. PATENT NUMBER:
9414704

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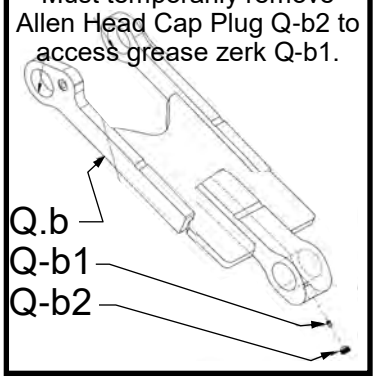
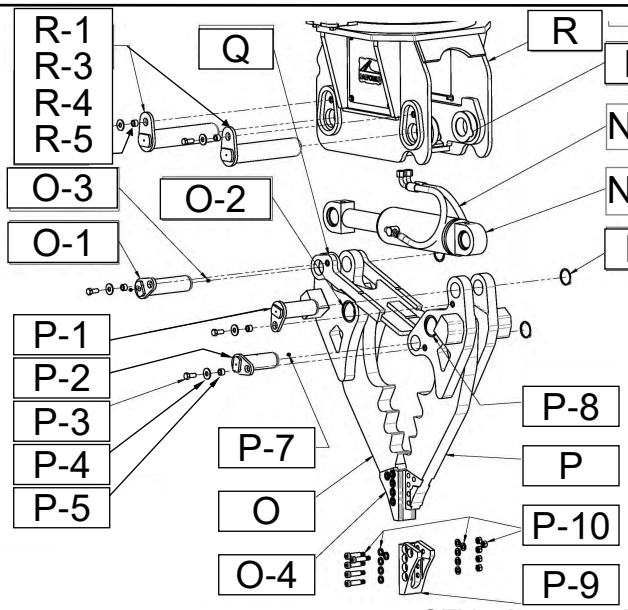
EX-30 PARTS DIAGRAM (PAGE 28)
SAS™ MID-SIZE EXTREME™ AUTO PROCESSOR
26-35 TON EX-30 SERIAL NUMBER F5902 & UP

Q. Parallel Bar model Q-b.

Hidden Grease Zerk with Allen head cap plug over it. Must temporarily remove Allen Head Cap Plug Q-b2 to access grease zerk Q-b1.



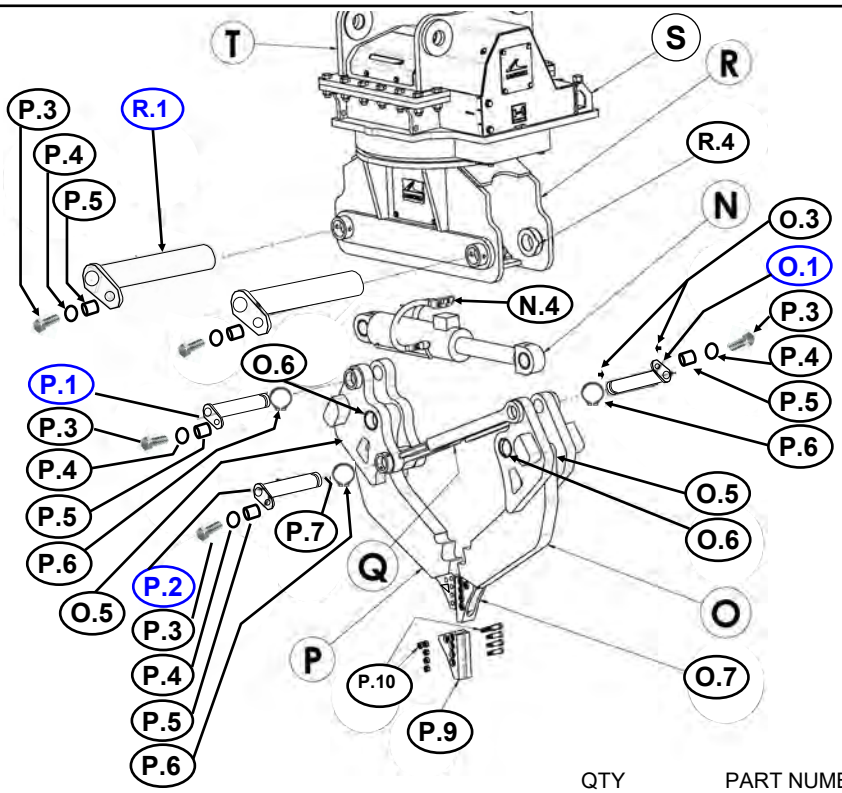


SAS PATENTED JAWS & TIPS

	DESCRIPTION			PART NUMBER
[N]	**CLAW CYLINDER**	QTY	**1**	**HY-CYL-5.0X11.25-5K**
	CYLINDER COMPONENTS (IDENTIFY CYLINDER STAMP TO SELECT CORRECT PARTS)			
	BM: Cyl stamp includes…. BM….N-1 CYL SEAL KIT		1	HK-5.00-783-244
	Cyl stamp includes…. BM….N-2 CYL PIN BUSHING		2	W-B2.500X3.000X2.000
	RR: Cyl stamp includes…. RR….N-1 CYL SEAL KIT		1	HK-5.00-732703
	Cyl stamp includes…. RR….N-2 CYL PIN BUSHING		2	W-B2.505X3.002X2.000
	N-3 CYL PIN GREASE SEAL		2	W-WIPER-2.5X3.0
	N-4 HOSE KIT: EXTEND & RETRACT HOSES		1	HY-EXTREME-KIT
	N-4.1 FITTING with O-rings BETWEEN HOSE & ROTATOR (w/hose kit)		2	HY-12MBSPPX10MORF
	N-4.2 FITTING with O-rings BETWEEN HOSE & CYLINDER (w/hose kit)		2	HY-848-TTO-10X10
	N-5 HOSE CLAMP-HOLDS HOSES UNDER ROTATOR		1	HY-CLAMP-1.10-2 HOSE
[O]	**CLAW ASSEMBLY W/TIP (FASTENED W/2 PINS:** R-3.1, O-3.1)		**1**	**EP-EX30-CLL-V2-3**
	O-1 PIN -(CONNECTS CYLINDER ROD END TO CLAW) LH		1	1912-06-V2 ASY
	O-2 BUSHING (FOR CLAW PIVOT)		2	W-B3.002X3.505X3.719
	O-3 GREASE ZERK (INSIDE BOTH ENDS OF PIN "0-3.1")		2	WGREASE ZERK 1/4-28
	O-4 **REPLACEABLE CLAW TIP** WITH 2 RIDGES		1	EP-EXC-CLAW-TIP-2-V3
[P]	**CLAW ASSEMBLY W/TIP (FASTENED W/3 PINS:** R-3.1, P-3.1, P-3.2)		**1**	**EP-EX30-CLR-V2-3**
	P-1 PIN -(CONNECTS CYLINDER BASE END TO CLAW) RH		1	1912-07-V2 ASY
	P-2 PIN -PARALLEL BAR PIN (CHOOSE CORRECT ONE)			
	P-2a S/N: F5902-F6443 (GREASE ZERK IN PIN)		1	1912-08-V2 ASY
	P-2b S/N: F6444 & UP (GR ZERK IN PRLL BAR. SOLID PIN)		1	1912-07-V2 ASY
	P-3 RETAINER BOLTS FOR PINS		5	WBOLT 0.625X1.50 GR8
	P-4 WASHER RETAINER BOLT		5	WASHER-F 0.625 GR8
	P-5 PIN-LOCK SPACER		5	SPACER-0625-0000
	P-6 C-CLIP RING		3	MCC-98410A231
	P-7 GREASE ZERK (INSIDE END OF PIN "P-2")		1	WGREASE ZERK 1/4-28
	P-8 BUSHING (FOR CLAW PIVOT)		2	W-B3.002X3.505X3.719
	P-9 **REPLACEABLE CLAW TIP** WITH 1 RIDGE		1	EP-EXC-CLAW-TIP-1-V3
	P-10 **TIP FASTENERS** - QTY 5 PER TIP - QTY 10 TOTAL (3/4" X 2-1/4" SHOULDER BOLT, 3/4" WASHER, 5/8" WASHER & 5/8" LOCK NUT)		10	EP-EXC-CLAW-TFAST-V3
[Q]	**PARALLEL BAR (CHOOSE CORRECT ONE. OK TO UPGRADE TO V2 IF PIN P–2 REPLACED ALSO)**			
	Q-a PRLL BAR V1 S/N F5902-F6443 Requires: PIN P-2a		1	EP-EX30-PBR-V1
	Q-b PRLL BAR V2 S/N F6444 & UP Requires: PIN P-2b		1	EP-EX30-PBR-V2
	Q-b1 GREASE ZERK Required for Q.b EP-EX30-PBR-V2		1	WGREASE ZERK 1/4-28
	Q-b2 SET SCREW (PLUG) Required for Q.b EP-EX30-PBR-V2		1	MCC-92311A353
[R]	**CLAMP BODY** EX30 s/n F5902 & higher		1	EP-EX30-CBY-V1
	R-1 PIN -MAIN CLAW PIVOT PIN		2	1911-10-V2 ASY
	R-2 3" ID SHIM X 0.09375" THICK		4	W-SC-SHIM-.094
	R-3 BOLT TO RETAIN MAIN CLAW PIVOT PIN		2	W BOLT 0.625X1.50 GR8
	R-4 FLAT WASHER		2	WASHER-F 0.625
	R-5 PIN LOCK SPACER		2	SPACER 0625-000

EX-35 PARTS DIAGRAM (PAGE 29)
SAS™ LARGE EXTREME™ AUTO PROCESSOR
26-35 TON EX-35 SERIAL NUMBER F5764 & UP

SAS PATENTED JAWS & PATENTED TIPS.



	DESCRIPTION	QTY	PART NUMBER
[N]	**CLAW CYLINDER (stamped BM-321-401)**	**1**	**HY-CYL-5.0X15.25-5K**
	N.1 CYLINDER SEAL REBUILD KIT	1	HK-5.00-321401SK-R00
	N.2 CYLINDER PIN BUSHING.....	2	W-B2.500X3.000X2.125
	N.3 CYLINDER PIN GREASE SEAL	4	W-WIPER-2.5X3.0
	N.4 HOSE KIT: EXTEND & RETRACT HOSES.....	1	HY-EXTREME-KIT
	N.5 HOSE CLAMP-HOLDS HOSES UNDER ROTATOR	1	HY-CLAMP-1.10-2 HOSE
	N.6 CYLINDER CHECK VALVE	2	HV-CRT-S-CKCB-XCN
[O]	**CLAW ASSEMBLY W/TIP (FASTENED W/2 PINS: R.1, O.1)**	**2**	**EP-EX35-CLAW-LH-V2-3**
	O.1 PIN (CONNECTS CYLINDER ROD END TO CLAW) LH	1*	1912-06-V2 ASY
	O.3 GREASE ZERK (INSIDE BOTH ENDS OF PIN 'O.1')	2	WGREASE ZERK 1/4-28
	O.5 GREASE ZERK (INSIDE BACK OF CLAWS TO GREASE MAIN PINS)	2	WGREASE ZERK 1/8 NPT
	O.6 BUSHING (2 REQUIRED FOR EACH MAIN CLAW PIVOT PIN)	2	W-B3.002X3.505X3.719
	O.7 REPLACEABLE CLAW TIP 2 RIDGES	1	EP-EXC-CLAW-TIP-2-V3
[P]	**CLAW ASSEMBLY W/TIP (FASTENED W/3 PINS: P1. P.2, R.1)**	**1**	**EP-EX35-CLAW-RH-V2-3**
	P.1 PIN (CONNECT CYLINDER BASE END TO CLAW) RH	1*	1912-07-V2 ASY
	P.2 PIN (CONNECT PARALLEL BAR)- RH W/GREASE ZERK IN PIN	1*	1912-08-V2 ASY
	P.3 RETAINER BOLT FOR PINS	5	WBOLT 0.625X1.50 GR8
	P.4 RETAINER FLAT WASHER	5	WASHER-F 0.6250. GR8
	P.5 RETAINER PIN LOCK SPACER	5	SPACER-0625-000
	P.6 C-CLIP RETAINER RING	4*	MCC-98410A231
	P.7 SMALL GREASE ZERK (INSIDE OF END OF PIN "P.2").....	2	WGREASE ZERK 1/4-28
	P.9 REPLACEABLE CLAW TIP WITH 1 RIDGE	1	EP-EXC-CLAW-TIP-1-V3
	P.10 TIP FASTENERS(3/4"x2-1/4" SHLDRBLT, 3/4"WSHR, 5/8"WSHR, 5/8"LOCK NUT)	10	EP-EXC-CLAW-TFAST-V3
[Q]	**PARALLEL BAR ASSEMBLY**	**1**	**EP-EX35-PARALLEL-V2**
[R]	**CLAMP BODY ASSEMBLY**	**1**	**EP-EX35-CLAMPBODY-V2**
	R.1 PIN MAIN CLAW PIVOT PIN (SEE P.8 & O.6 FOR BUSHINGS)	2	1911-10-V2 ASY
	R.4 3" ID SHIM X 0.09375" THICK.....	4	W-SC-SHIM-.094
[S]	**ROTATOR XR600 (EX35-v3 F5764 & UP)**	**1**	**HR-ROTAR-N-XR600**
[T]	**STICK MOUNT ASSEMBLY**	**1**	**VARIES WITH MACHINE**

PRODUCT LIMITED WARRANTY CERTIFICATE

SAS FORKS – SAS RAIL

WHAT IS COVERED

For products that SAS Forks and SAS Rail manufactures, SAS™ warrants that such products conform to all specifications for materials and workmanship for the time indicated below, after delivery, and return of completed product warranty registration within 10 days of initial operation to SAS. when used in compliance with the SAS™ Operator Manual for your product.

HYDRO MECHANICAL PRODUCTS

PRODUCT	LIMITED WARRANTY PERIOD	ITEM	COVERED
EXTREME™, VULTURE, PINCER	1 year from original ship date	Head Unit & Hold Down Structure	Defects in materials & workmanship
	1 year from original ship date	Hydraulic cylinders, Hydraulic Rotator Motor Assembly, Hoses	Defects in materials
SCORPION, ENGINE CLAW GRAPPLE RAKE	1 year from original ship date	Structure & Assembly	Defects in materials & workmanship
	1 year from original ship date	Hydraulic cylinders, Hydraulic Hoses	Defects in materials
LOADER QUICK COUPLERS, RAIL COUPLERS	1 year from original ship date	Structure & Assembly	Defects in materials & workmanship
	1 year from original ship date	Hydraulic cylinders, Hydraulic Hoses	Defects in materials

MECHANICAL PRODUCTS

PRODUCT	LIMITED WARRANTY PERIOD	ITEM	COVERED
ALL FORK PRODUCTS, ALL DUMPSTER PRODUCTS, ALL HITCH PRODUCTS	1 year from original ship date	Structure & Assembly	Defects in materials & workmanship

No warranty on other products not listed above, unless otherwise specified on the face of the original invoice.
No warranty against abrasion wear, claw chip wear, fork tip damage, blade bending, fusible link, separation, bent fork mounting shafts, hoses, cables, or wires.
No warranty against used equipment. All used excavators, loaders, and other equipment sold “AS IS”.
SAS™ does not warranty the products that it does not manufacture. Rather all warranties, if any, for these products are supplied by the manufacture.
Seller responsible for standard shipping costs.

Warranty compensation consideration; parts, labor-75% of in-shop rate, Max $125/hr. , travel time- $45/hr. , Max 4-hrs. , milage rate current US standard per mile, max 125 miles.

SELLER EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

CALL FOR LIMITED WARRANTY CONSIDERATION:
To be considered for warranty repairs or replacement buyer must notify SAS™ of any warranty claim within 10 days after such claim arises, and prior to expiration of the warranty period and prior to the performance of any repairs being done, otherwise buyer waives all rights to such claim.

- Supply the SAS™ serial number & call SAS™ Parts /Service at 920-845-2198.
- Submit completed Warranty Request Form that clearly describe the problem and the operation that was taking place when it occurred.
- Buyer is to return defective assembly if requested, freight prepaid, or photographic evidence clearly showing the problem area and details of failure to SAS™ for review. When necessary, a factory representative may evaluate the problem in the field.

WHAT SAS WILL DO:
SAS™ will examine the defective product, and the details of the failure. If SAS™ determines that the failure of materials or workmanship was proven to be within the terms of this limited warranty, SAS™ will, at it’s option, repair or replace, Freight On Board (FOB) to the factory, in Luxemburg, WI, USA, the defective product. If the product cannot be returned to the factory, SAS™ may approve field repair of defective product. SAS™ will approve an appropriate amount of hours and cost for the repair before authorizing repairs to begin. No provisions will be made for incidental damages, mileage, travel time, overtime, downtime, or special freight charges.

CONDITIONS THAT WILL VOID YOUR LIMITED WARRANTY:
Failures, which in our determination were the result of:

- Improper installation.
- Misapplication - See SAS FORKS™ Operator Manual.
- Misuse or improper operation – See SAS FORKS™ Operator Manual.
- Exceeding the weight and/or lift limitation posted on the Identification Plate attached the SAS FORKS™.
- Negligence or failure to perform routine inspection and/or maintenance as outlined in the SAS FORKS™ Operator Manual.
- Unauthorized modification, welding, burning, grinding, installation of non-factory skid plates, etc. (other than specifically allowed in the SAS FORKS™ Operator Manual or as provided in a written authorization directly from SAS™ Factory Engineers.).
- Continued use after a malfunction of the hydraulic system in the forklift or loader.
- Accidental damage by third party.

GOALS OF THE S.A.S. OF LUXEMBURG, LLC. LIMITED WARRANTY PROCEDURE

- ASSURE MINIMUM CUSTOMER DOWNTIME by resolving the problem correctly on a timely basis.
- ASSURE END-USER CONFIDENCE while maintaining an equitable warranty expense for both your company and SAS.
- PRODUCT IMPROVEMENT. We have an engineering staff ready to assist you. Call us at 1-877-SAS-FORK (1-877-727-3675)

Please call S.A.S. of Luxemburg, LLC. before attempting any repair, modification, or questionable job applications.

2026/04

Declaration of Conformity for CE Marking
EU Directive 2006/42/EC (Machinery Directive)

We declare that the products listed below conform to the listed provisions of the following Council Directives

Model	Description
Extreme Auto Processor	Hydraulically actuated attachment for excavator used to extract vehicle engines for salvage operations

Conforms to the following directives:

2006/42/EC	Machinery Directive
ISO 10567_2007	Earth Moving Machinery Hydraulic Excavators

Date of CE Marking: October 20, 2014

Technical Construction File is maintained at:

SAS Headquarters
133 Center Drive Hwy 54
Luxemburg, WI 54217 USA

Signed

Amy Roznowski, CFO
S.A.S. of Luxemburg, LLC.
DBA: SAS FORKS
133 Center Drive Hwy 54
Luxemburg WI 54217-0260 U.S.A.

WARRANTY REQUEST

TYPE: _____ **SERIAL #:** _____

DATE: _____ **W.R. #:** _____ *available on request or own nr.* **SALES ORDER #:** _____

USER — PAY TO ☐

Name: _____ Address: _____

Delivery Date: _____ Contact: _____

DEALER — PAY TO ☐

Name: _____ Address: _____

Invoice Date: _____ Contact: _____

BASE MACHINE

Machine: _____ Model: _____

Year of Manuf.: _____ Weight: _____

BRACKET

Machine: _____ Model: _____

FUNCTION SETTINGS

Cylinder Circuit: _____ psi _____ gpm Rotation Circuit: _____ psi _____ gpm

Hammer Circuit: _____ psi _____ gpm

USE

Type of Work: _____

FAILURE INFORMATION

Date of Failure: _____ Date of Repair/Approval: _____

Description: _____

Precise description of damage, place of damage, or other relevant facts, performed measures and repairs etc. Material- and/or production failures that are founded at the warranty request, earlier correspondence, desirable measures etc.

☐ Enclosures ☐ Parts Returned for Judgement, Date: _____

Signature of Claimant

REQUESTED PARTS

Invoice #: _____ Invoice Date: _____

Part #	Serial #	Description	Quantity	Unit Price $	Amount $	Internal Tenamec Agr. %	Internal Tenamec Corr.
Overig				Subtotal $:			

Desirable measures: ☐ Replace parts ☐ Credit Total $:

Date of receipt	Judgement date	Reply date	Approval/Disapproval	Order #	Handled	Gen. Man.

Requests for Warranty are then to be handled when the first operation form has been, fully filled in and signed, returned to Tenamec. The request form must be received by Tenamec 14 days after failure date. Defective parts must be returned to Tenamec for judgement within 14 days after request date. These parts must be marked with the W.R. #.

SEND TO WARRANTY@SASFORKS.COM

133 Center Drive, P.O. BOX 260, Luxemburg, WI 54217 • 1-877-727-3675 • www.tenamec.com

WARRANTY REGISTRATION

for Hydraulic Tools

TENAMEC
ENGINEERED TOUGH

BUILTRITE SAS FORKS DRKhorse SAS RAIL LEMCO

TYPE: _____

SERIAL #: _____

☐ **SALE** ☐ **RENTAL** Period: _____ - _____ ☐ **DEMO** Period: _____ - _____

USER

Name: _____ Contact: _____

Address: _____ Telephone: _____

Zip: _____ Country: _____

DEALER

Name: _____ Delivery Date: _____

BASE MACHINE

Make: _____ Year of Manufact.: _____

Model: _____ Weight: _____

BRACKET

Make: _____ Model: _____

USE - TYPE OF WORK

_____

DATE FIRST OPERATION: _____

CHECKLIST BEFORE FIRST OPERATION

Work to do			OK	Remarks
- Checking fastening screws und nuts			☐	
- Lubrication bearings and pins			☐	
- Testing electrical components			☐	
- Setting hydraulical functions at required values:				
Cylinder Circuit:	_____ psi	_____ gpm	☐	
Hammer Circuit:	_____ psi	_____ gpm	☐	
Rotation Circuit:	_____ psi	_____ gpm	☐	
- Function test machine			☐	
- Instructed user on about operation and maintenance			☐	
- Hand over users manual and Parts book			☐	
- Hand over warranty request			☐	

_____ _____ _____

Date *Signature of Dealer* *Signature of Customer*

The first operation form must be received by Tenamec within 14 days after the first operation/invoice date. Attention! Warranty claim requests are then to be attended when the first operation form has been, fully filled in, signed and sent to Tenamec!

SEND TO WARRANTY@SASFORKS.COM

133 Center Drive, P.O. BOX 260, Luxemburg, WI 54217 • 1-877-727-3675 • www.tenamec.com