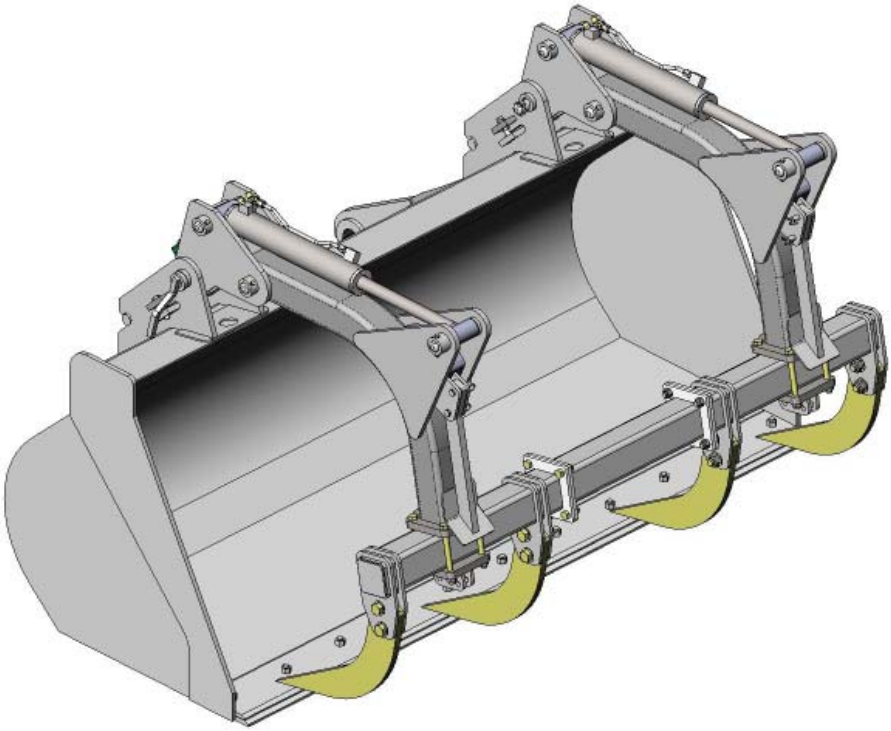
GrabTec

Wheel Loader Grapple

OWNER'S MANUAL

Includes all Installation Instructions



QUICK-ATTACH Models

GA84, GA90, GA96 (Four Tines)

GA905, GA965, GA102 (Five Tines)

www.grabtec.com
email: sales@grabtec.com

Jan 2011

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(712) 477-2675
FAX (712) 477-2500

PREFACE

This manual describes the installation, operation and maintenance of the Grabtec grapple. Please read and understand this manual in its entirety before performing installation, operation, or maintenance procedures to ensure the satisfactory performance and durability of the grapple. Read and follow all safety and precautionary notes included in this text. Any questions related to this product should be directed to Grabtec Customer Service at1-888-857-8952 (712- 477-2675).

CONTENTS

SAFETY STATEMENTS

⚠ DANGER	This statement is used where serious injury or death will result if the instructions are not followed properly.
⚠ WARNING	This statement is used where serious injury or death could result if the instructions are not followed properly.
⚠ CAUTION	This statement is used where minor injury could result if the instructions are not followed properly.
CAUTION	This statement is used where equipment or property damage could result if the instructions are not followed properly.

GENERAL PRECAUTIONS

◊ READ MANUAL PRIOR TO INSTALL or OPERATION

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read all manuals related to this equipment thoroughly before beginning installation, operation, or maintenance.

◊ AVOID ESCAPING FLUID that is under PRESSURE

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure.

◊ PROTECT AGAINST FLYING DEBRIS

When driving connection pins, always guard against injury from flying pieces of metal or debris. WEAR GOGGLES OR SAFTEY GLASSES.

◊ SUPPORT RAISED EQUIPMENT

Do not work under raised loader booms, buckets or grapples without supporting them. Lower booms, buckets and grapples onto blocks.

◊ DO NOT MODIFY GRAPPLE

Do not modify the grapple in any way without written authorization and instructions from Grabtec Customer Service at 1-888-857-8952 (712-477-2675). Modifications may weaken the integrity of the grapple and may impair the function, safety, usable life, and performance of the grapple.

◊ DO NOT IMPROPERLY USE GRAPPLE

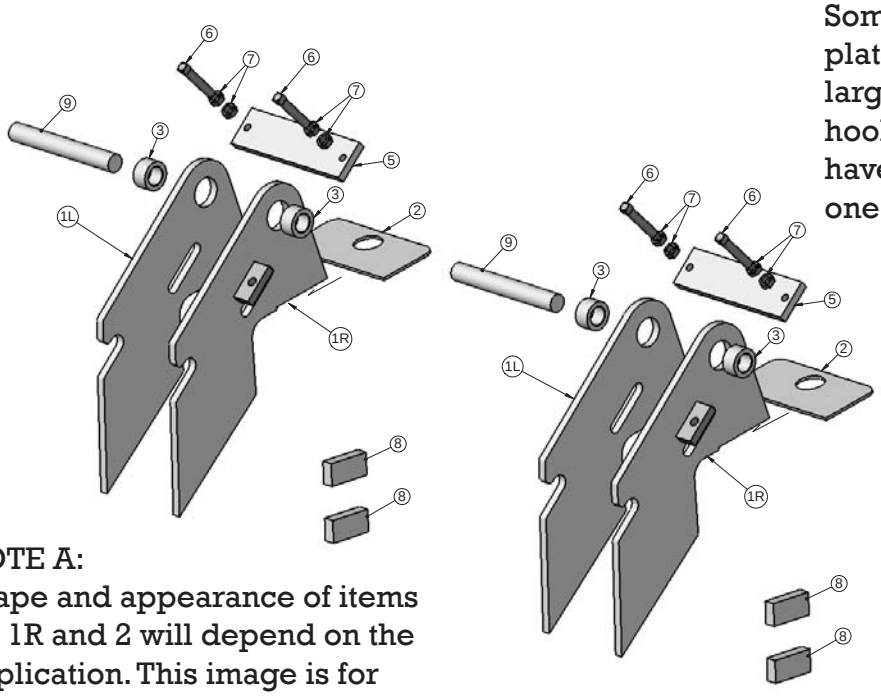
Grapples are designed to be used as material handling tools for loading or transporting material that can be safely contained in the bucket the grapple is mounted on. Uses outside this method of material handling must be approved by Grabtec.

INSTALLING MOUNT KIT ONTO THE BUCKET

NOTE

A mounting kit includes parts for each the left and right side of the bucket. Each side is usually identical to the other. The purpose of the diagram is to identify various parts of the kit. The spacers and alignment pins are used only during installation of the kit. They are purchased separately from the mounting kit. Your mount kit either included hook plates that are shaped to fit your bucket or the hook plates are universal and need to be trimmed to fit (see section later in this manual, pages 9-10.)

NOTE B:
Some kits do not require doubler plates (Item 2). Some kits have 2 large plates that each fit under 2 hook plates (as shown). Some kits have 4 small doubler plates, with one doubler for each hook plate



NOTE A:
Shape and appearance of items 1L, 1R and 2 will depend on the application. This image is for reference only.

Mount Kit

ITEM	DESCRIPTION	QTY / KIT
1L	HOOK PLATE, LEFT	2
1R	HOOK PLATE, RIGHT	2
2	DOUBLER PLATE (NOT REQ'D FOR ALL KITS)	2
3	COLLAR (1.58" ID)	4
5	SUPPORT PLATE	2
6	SET SCREW, 3/4 X 4	4
7	JAM NUT, 3/4	8

Assembly Kit (Optional)

ITEM	DESCRIPTION	QTY / KIT
8	SPACER, 1" THICK, 2 X 4	4
9	ALIGNMENT PIN (1.57" DIA. x 12 LONG)	2

INSTALLING MOUNT KIT ONTO THE BUCKET

STEP 1 (See Figure 1)
This step is best done on a large bench with the mount kit parts and torque tube assembly upside down. Slide the hook pin of the torque tube assembly into each "hook" of the hook plates. Slide the alignment pin through the long tapered sleeve of the torque tube and align it with the two 2-1/2" diameter holes of the hook plates. Slide a collar onto each end of the alignment pin and into the large holes of the hook plates so that the collars are flush with the inside of the hook plates. Insert one 1" thick spacer on each side of the torque tube and clamp the hook plates to the torque tube so that the space between the hook plates is 8".

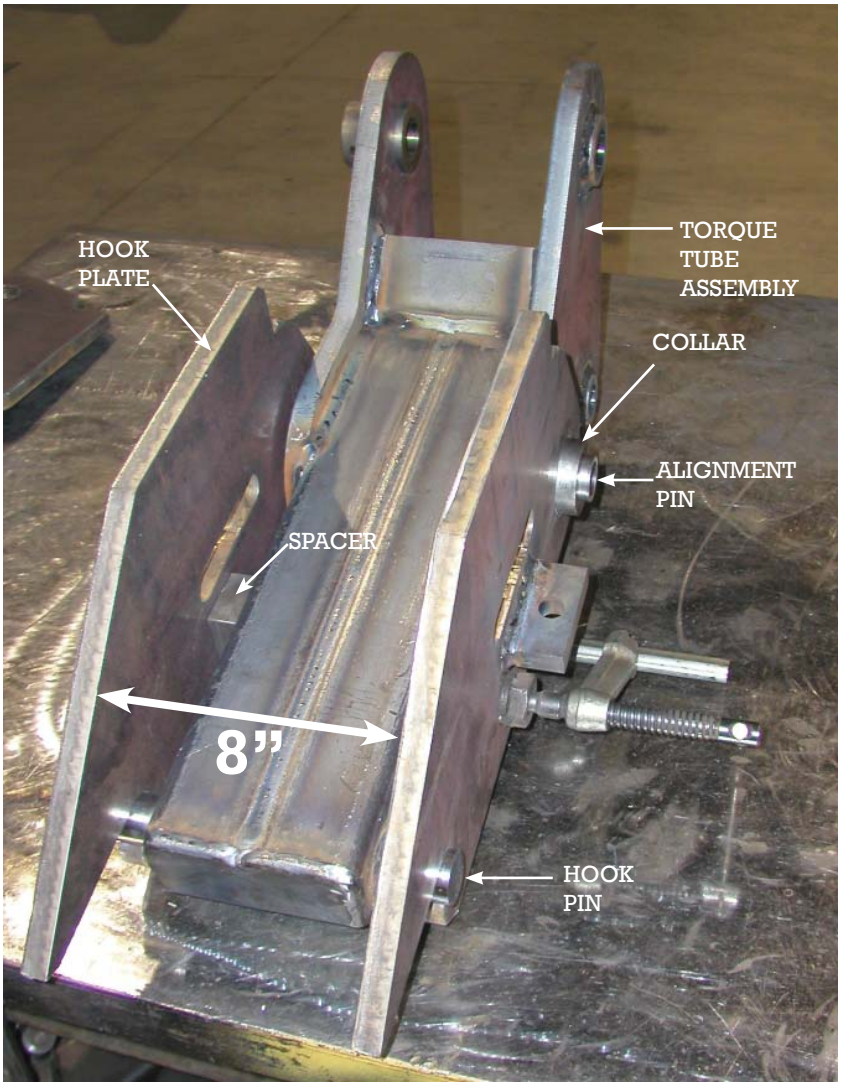


Fig. 1

INSTALLING MOUNT KIT ONTO THE BUCKET

STEP 2 (See Figure 2)
Once the mounts have been clamped together, they can be placed on the bucket. Each mount must be square with the other and square to the bucket so that the grapple does not bind as is rotates. The best results can be achieved by running a long 1-1/2" shaft or pipe through the grapple pivot holes on the torque tubes. The best center-to-center distance to use depends on the width of the grapple and also the presence of any obstructions on the back of the bucket, such as gussets or splash guards. Use the following table to help determine what center-to-center position of the mounts would work best in your application. If you need help determining what Model you have, see page 29.

MODEL	GRAPPLE OVERALL WIDTH	STANDARD CENTER-TO-CENTER OF MOUNTS**
GA84	84"	56" +/- 6"
GA90, GA905	90"	62" +/- 6"
GA96, GA965	96"	68" +/- 6"
GA102	102"	74" +/- 6"
** The mounts can be installed with a center-to-center spacing up to 6" wider than the standard spacing that is listed. However, the hydraulic hoses that are included with your grapple (see Items 2 & 3 on page 27) are only long enough for the standard center-to-center spacing.		

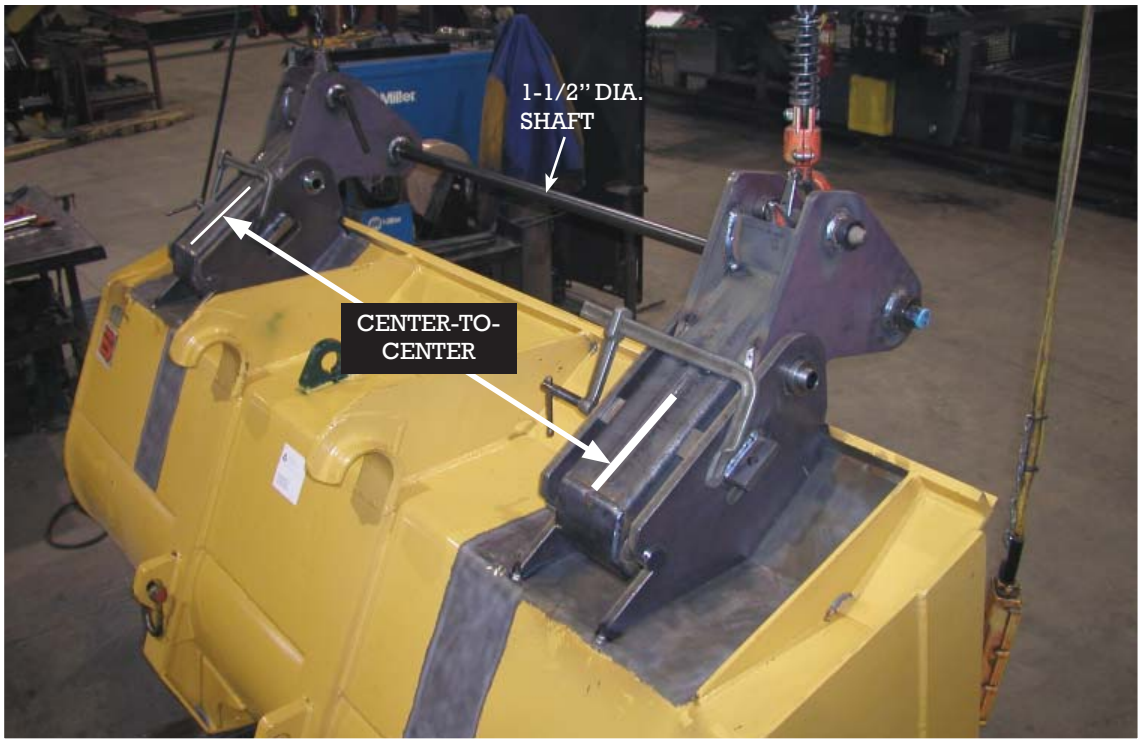


Fig. 2

INSTALLING MOUNT KIT ONTO THE BUCKET

STEP 3 (See Figure 3)
Once the mounts are square and properly spaced, tack the four hook plates to the bucket. It may also be helpful at this time to double check just where the tips of the grapple teeth will end up with the mounts in their current position. DO NOT TACK OR WELD THE COLLARS YET.

STEP 4 (See Figure 4)
Remove clamps, spacers, collars, alignment pins and long alignment shaft from the mounts. Tilt the bucket forward and support it. Weld the hook plates (and doubler plate if applicable) to the bucket. A welder using 0.045 wire and capable of 250-300 amps works best. A 3/8" single-pass, continuous fillet weld is required for all parts that are being welded to the bucket.

STEP 5 (See Figure 5)
Referring to the mount diagram earlier in this section and Figure 5, assemble the support plates within the hook plates. Have the set screws adjusted so that the support plate is as far down as possible.

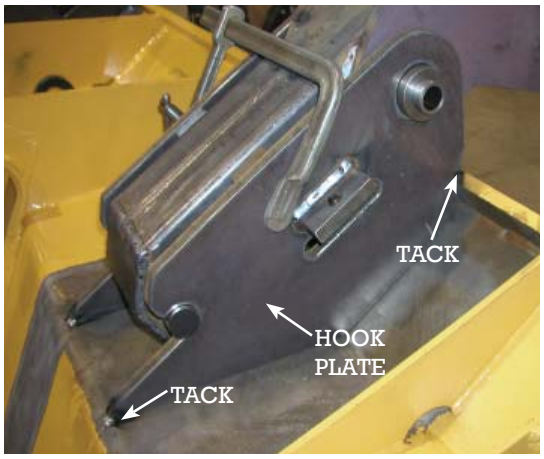


Fig. 3


Fig. 4

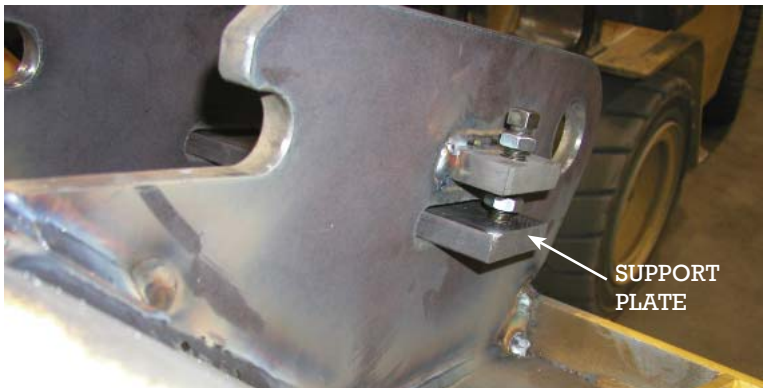


Fig. 5

INSTALLING MOUNT KIT ONTO THE BUCKET

STEP 6 (See Figure 6)
With the bucket tilted forward, re-install the torque tube assemblies into the mounts. The downward tilt of the bucket will keep the weight of the torque tubes properly engaged in the hooks of the hook plates. Also install the collars into the hook tubes with the help of the alignment pin. The inside surface of the collars should be flush with the inside of the hook plates.

STEP 7 (See Figure 7)
Adjust the set screws on each side of the mount until the support plate is supporting the torque tube evenly AND the alignment pin can be twisted with your fingers.

STEP 8 (See Figure 8)
Once you are comfortable with the adjustment position of the set screws and the alignment pin is still free to turn, tack the collars in their permanent position. If the tacks cause the collars to tighten up on the pin, a few taps with a hammer on the collars should re-align them.

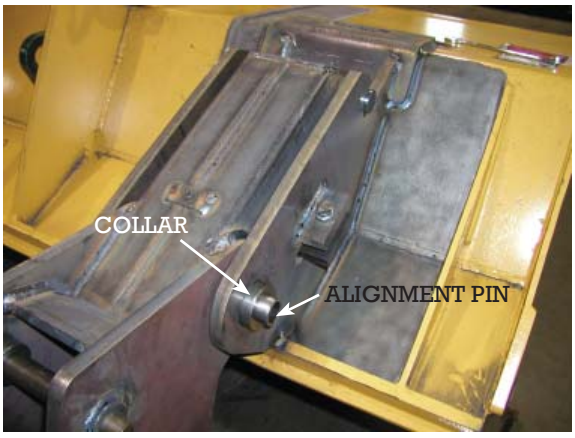


Fig. 6

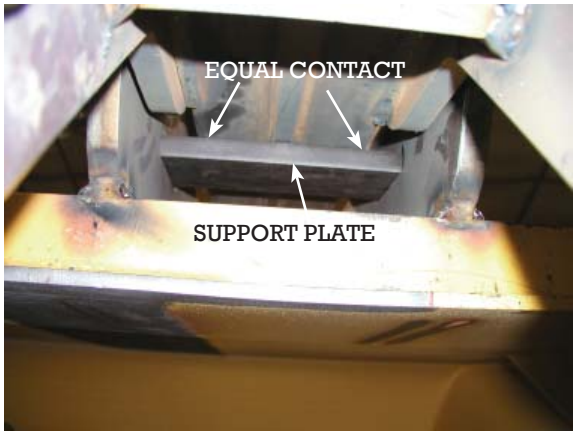


Fig. 7

Fig. 8

INSTALLING MOUNT KIT ONTO THE BUCKET

STEP 9 (See Figure 9)
Weld the collars in their permanent position. They can be welded on the outside only as shown, since they are flush with the hook plates on the inside.

STEP 10 (See Figure 10)
The alignment pin used in Steps 1-8 is approximately 0.025'' larger than the actual retaining pin. If all has been done correctly up to this point, you will find that the retaining pins are loose enough to be easily pushed in by hand. It is advised that you use the set screws to adjust the torque tube *slightly upwards* so their is a slight drag on the retaining pins. This ensures that the pins are contacting the torque tubes, but they will still be easy to remove by hand when the grapple is dismounted from the bucket. See the section titled ''Adjustment of the Support Plates'' later in this manual for a more information.

Fig. 9

Fig. 10

TRIMMING "UNIVERSAL" MOUNTS TO FIT THE BUCKET

NOTE

IGNORE THIS SECTION IF YOU RECEIVED A MOUNT KIT MADE FOR YOUR SPECIFIC BUCKET (which happens 99% of the time - this Section is rarely needed)

Grabtec Inc will make every effort to provide a Mount Kit that is designed to fit your bucket and will locate the grapple in the proper poistion. However, rare cases do occur when a "universal" mount kit is all that can be supplied. The four 3/4" thick hook plates that are included in the mount kit will need to be trimmed to fit the profile of your bucket and to position the grapple properly in respect to the cutting edge of the bucket.

STEP 1 (See Figure 1)
The positioning template is furnished in 2 parts. Tack weld the two parts together as shown.

STEP 2 (See Figure 2)
Position the template over the bucket so that the tip of the template (which represents the tips of the grapple teeth) is in the desired position. Please note that the tip should be approximately 3" above the cutting edge. If the tip is inside the bucket, or within 1" of the cutting edge or a cutting edge bolt, it is possible for the grapple teeth to contact them when the grapple is dismounted. VERY IMPORTANT - If the depth of your bucket is less than 42", (See Figure 2) the grapple will probably have to be positioned so that the teeth are actually ahead of the cutting edge. This is because it is likely that when the bucket is tilted all the way back and the loader is all the way down, the Mount kit may actually contact the front tires. Tilt the bucket back and use the template to see how much clearance there is between the front tire and the bucket before finalizing exactly where the grapple can be located.

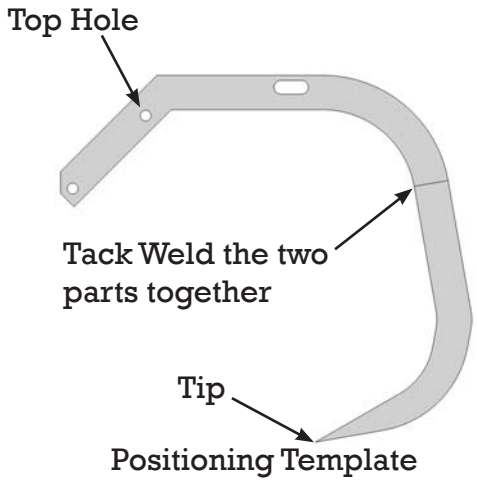


Fig. 1

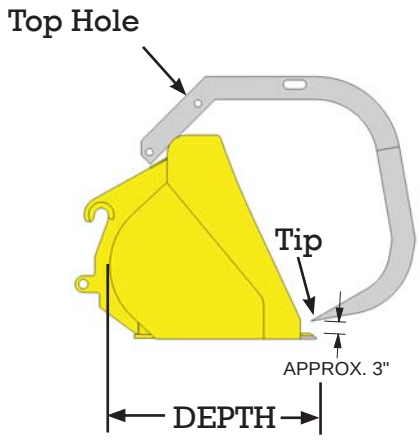


Fig. 2

TRIMMING "UNIVERSAL" MOUNTS TO FIT THE BUCKET

IGNORE THIS SECTION IF YOU RECEIVED A MOUNT KIT MADE FOR YOUR SPECIFIC BUCKET (which happens 99% of the time - this Section is rarely needed)

STEP 3 (See Figure 3)
Another way to know the relation between the top hook plate hole and the position of the grapple teeth is by taking a few measurements. In Figure 3, notice that the tip of the grapple teeth will be 48 inches below the top hole and 25 inches in front of it. The proper angle of the top edge of the hook plate is 45 degrees as shown. Typically, you want the grapple teeth 2-3 inches above the very front of the cutting edge. From this imaginary point, measure back 25 inches and up 48 inches and you will know approximately where the top hole of the hook plates has to be. This method is satisfactory, but the use of the positioning template as described in Step 2 is the preferred method, since it gives a better picture of just where the grapple will be once its installed.

STEP 4 (See Figure 4)
Once you know where the top hole of the hook plate should be located on your bucket, you must transfer the profile (shape) of the bucket onto the universal hook plates so that they can be trimmed to fit. Please note that the shape of the trimmed hook in Figure 4 is for demonstration only and may not look anything like the shape required for your bucket.

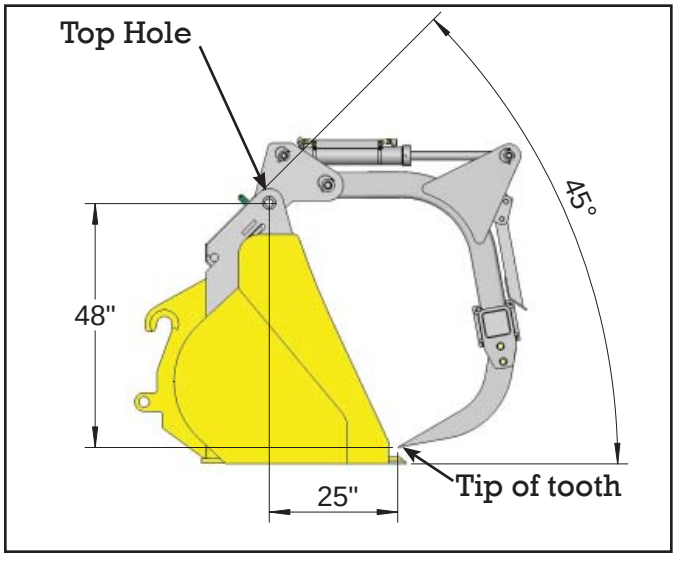


Fig. 3

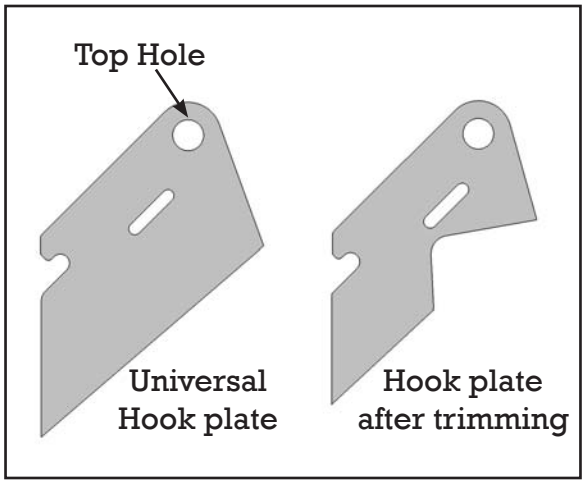


Fig. 4

ASSEMBLY OF GRAPPLE ONTO BUCKET

⚠ WARNING

USE A CRANE OR A HOIST TO LIFT ALL ITEMS THAT WEIGH MORE THAN 50 LBS

NOTE

Reviewing the Parts Listing found later in this Manual will assist in relating the part descriptions in the Instructions with items used for assembly

STEP 1 (See Figure 1)
Position torque tube assembly onto the mount that is welded on the bucket and secure the torque tube with the retaining pin.

CAUTION

The zero-maintenance feature of the pivot pins and pivot housings of the Grabtec grapple is dependant upon proper care when installing the pins. Please read the "Maintenance" section of this manual before installing any of the pivot pins.

STEP 2 (See Figure 2)
Using a 1-1/2" diameter pivot pin, connect the pivot assembly to the torque tube. Secure the pivot pin using a 3/8 x 3 bolt and nylock nut.

STEP 3 (See Figure 3)
In preparation for the installation of the cylinder, lift and support the pivot assembly as shown.

Fig. 1

Fig. 2

Fig. 3

STEP 4 (See Figure 4)
Install the cylinders between the torque tube and pivot assembly as shown. The two cylinders that came with the grapple are identical, there is not a right and a left cylinder. Secure the pins using 3/8 x 3 bolts and nylock nuts (not the snap lock pins that are in the picture).

STEP 5 (See Figure 5)
Bolt the outer tooth bars to the center tube using (8) 3/4 x 2 bolts and top-lock nuts.

STEP 6 (See Figure 6)
Lift the tooth tube up to the pivot tubes and drop the long 3/4" bolts into the upper clamp plates.

STEP 7 (See Figure 7)
Install the two lower clamp plates, center the tooth tube between the pivot tubes and tighten the nuts .

Fig. 4

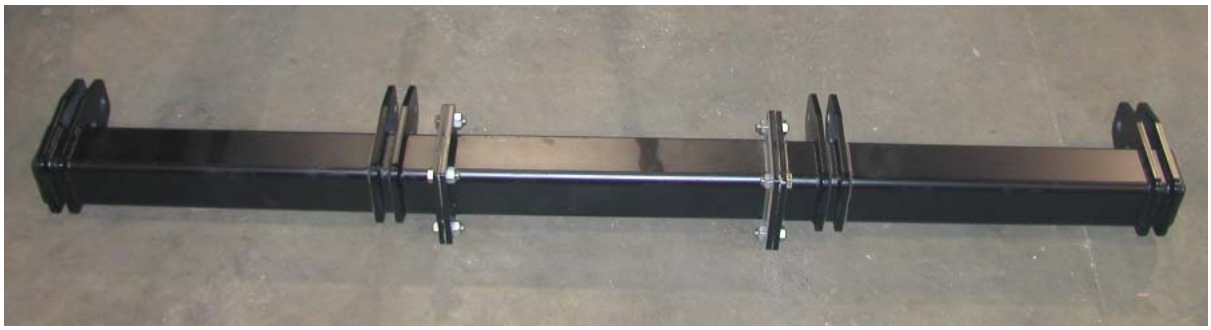


Fig. 5

Fig. 6

Fig. 7

STEP 8 (See Figure 8)
Install the teeth. Be sure to use a hardened flat washer under the head of the bolt and under the nut.

STEP 9 (See Figure 9)
Install the stand legs using the 3/4" diameter clevis pins and hairpin cotters.

STEP 10 (See Figure 10)
Install supply hoses and tees that go inbetween the cylinders. The lengths of these hoses depend on the grapple model. Use the hose connection sketch on page 27 as a guide. It is important that each tee is supplying the proper ports on the cylinders so that the cylinders work together. A short piece of hose wrap (26" long) should go between the cylinder ports and the hose clamp on the back of the torque tube. Longer lengths of hose wrap can be installed between the hose clamps and the tees. The position of the tees (bucket center, left, or right) will depend on where the loader's auxiliary hoses are located on the loader boom.

Fig. 8

Fig. 9

Fig. 10

QUICK-DISCONNECTING THE GRAPPLE FROM THE BUCKET

STEP 1(See Figure 1)
Drive bucket over level, hard ground and tilt it forward as shown. Move the parking stands to their park position, making sure that the pad of the stand is facing the ground.

⚠ WARNING

◊ DO NOT STAND IN FRONT OF THE BUCKET AND GRAPPLE WHEN PERFORMING STEP 2. STAND TO THE SIDE.

STEP 2 (See Figure 2)
Note how the bucket is tilted downward enough so that the retaining pin is below hook pin. This will ensure that the weight of the grapple is restrained by the hook pin. Pull out the retaining pins that secure the grapple to the mounts. If the pins are difficult to remove, it may be necessary to adjust the support plates. See the section titled "Adjustment of the Support Plates" found later in this manual.

Fig. 1

Fig. 2

QUICK-DISCONNECTING THE GRAPPLE FROM THE BUCKET

STEP 3 (See Figure 3)
Disconnect the grapple hydraulic hoses from the wheel loader's auxiliary supply. For some large and deep-bottom buckets (deeper than 48"), it may be best to leave the grapple hydraulics connected thru Step 5. This way the grapple cylinders can be used to help disengage the grapple from the hooks on the bucket. REMEMBER to disconnect hoses before backing away!

STEP 4 (See Figure 4)
Lower the bucket and grapple to the ground so that the stand legs and the outer curved edge of the teeth touch the ground at about the same time.

STEP 5 (See Figure 5)
Rotate the bucket to un-hook the mounts from the hook pins of the grapple and back away. With some large and/or very deep buckets, it may be necessary to actuate the grapple cylinders to aid in disconnecting the hook pins from the bucket mounts.

Fig. 3

Fig. 4

Fig. 5

QUICK-CONNECTING THE GRAPPLE TO THE BUCKET

STEP 1 (See Figure 1)
Approach the grapple with the floor of the bucket nearly straight up and down.

STEP 2 (See Figure 2)
Hook the mounts into the hook pins of the grapple and begin rotating the bucket until the grapple is just slightly lifted off the ground and the weight of the grapple is still supported by the hook pins.

STEP 3 (See Figure 3)
Insert the retaining pins that secure the grapple to the mounts. If the pins are difficult to install, it may be necessary to adjust the support plates. See the section titled "Adjustment of the Support Plates" found later in this manual.

Fig. 1

Fig. 2

Fig. 3

QUICK-CONNECTING THE GRAPPLE TO THE BUCKET

STEP 4 (See Figure 4)
Connect the grapple hydraulic hoses to the wheel-loaders auxiliary supply.

STEP 5 (See Figure 5)
Place the stand legs in their store position.

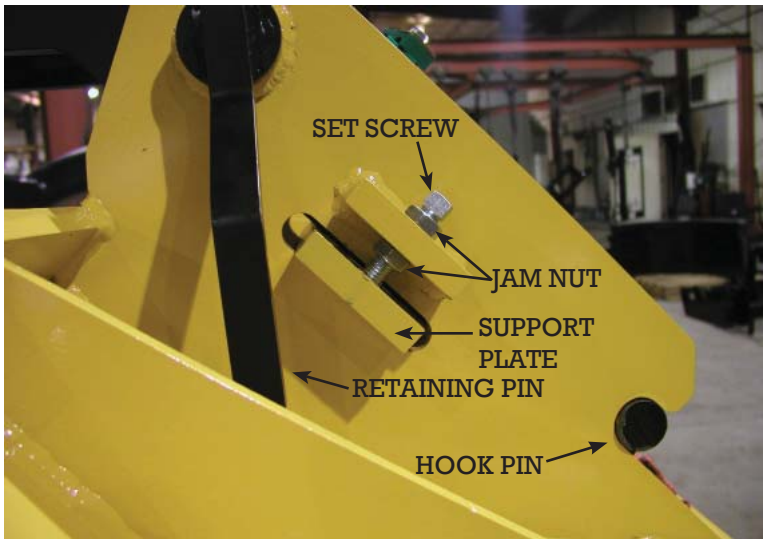
Fig. 4

Fig. 5

ADJUSTMENT OF THE SUPPORT PLATES

NOTE

The photo below shows the grapple when the bucket is flat on the ground. For best results, adjustment of the support plates should take place when the weight of the grapple is being supported by the hook pins, as shown in Fig 2 of "Quick Disconnecting the grapple from the Bucket" on Page 14.



The Grabtec grapples have a unique feature in that they can be quickly disconnected from the bucket by removing two pins. There are two critical requirements that allow the pins to be removed easily (by hand). The first is that the mounts were installed correctly and that the collars that the pins slide through are properly aligned with the grapple. The second is that the support plates are adjusted correctly.

FUNCTION

When turned in the proper directions, the jam nuts and set screws can raise or lower the support plate. The support plate is "supporting" the grapple. When the support plate is moved, the grapple rotates about the hook pin and the upper holes in the mount that the retaining pin slides through can be better aligned with the long sleeve in the grapple. As the alignment improves, the retaining pin is more easily installed (or pulled out).

TO ADJUST THE SUPPORT PLATES UPWARD

Loosen the lower jam nut. Turn the top jam nut clockwise while keeping the set screw from turning. When proper adjustment is achieved, tighten both jam nuts.

TO ADJUST THE SUPPORT PLATES DOWNWARD

Loosen the top jam nut. Turn the lower jam nut counter-clockwise while keeping the set screw from turning. When proper adjustment is achieved, tighten both jam nuts.

MAINTENANCE

NOTE

The pivots on each end of the cylinders and the main pivots for the grapple frame are equipped with zero-maintenance bushings. There are no grease zerks on the grapple. Each end of the bushing housings are equipped with wiper-style dust seals to keep out debris. This pin system has proven to provide years and years of service in severe duty environments, provided the following precautions are met:

◊ IF YOU REMOVE A PIVOT PIN, MAKE SURE IT IS CLEAN AND DRY BEFORE YOU REINSTALL IT.

◊ IF YOU REMOVE A PIVOT PIN, DO NOT PERFORM ANY GRINDING OR WELDING THAT WOULD ALLOW PARTICLES TO ENTER THE BEARING HOUSING.

◊ DO NOT ATTEMPT TO LUBRICATE THE PINS WITH ANYTHING.

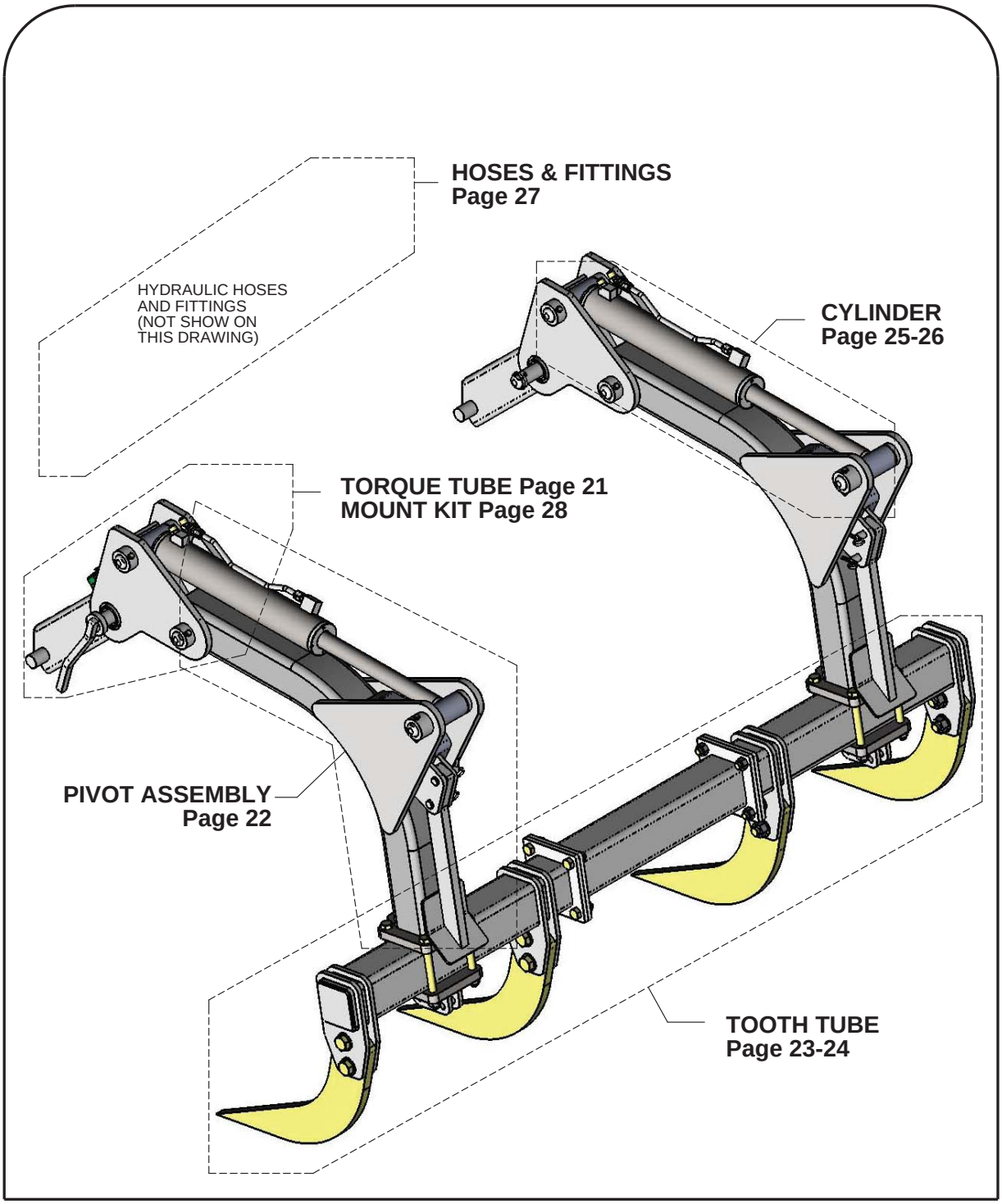
◊ IF A DUST SEAL (WIPER SEAL) THAT PROTECTS THE BEARING HOUSING IS DAMAGED, REPLACE IT.

◊ DO NOT REPLACE A PIVOT PIN WITH ANYTHING OTHER THAN A GRABTEC PIVOT PIN MADE FOR YOUR GRAPPLE MODEL. THE EXTREMELY DURABLE AND HARD CHROME FINISH OF THE GRABTEC PINS IS IMPORTANT FOR THE LIFE OF THE BUSHINGS AND FOR THE RESISTANCE TO CORROSION IN THE PIN HOUSING.

MAINTENANCE PROCEDURES

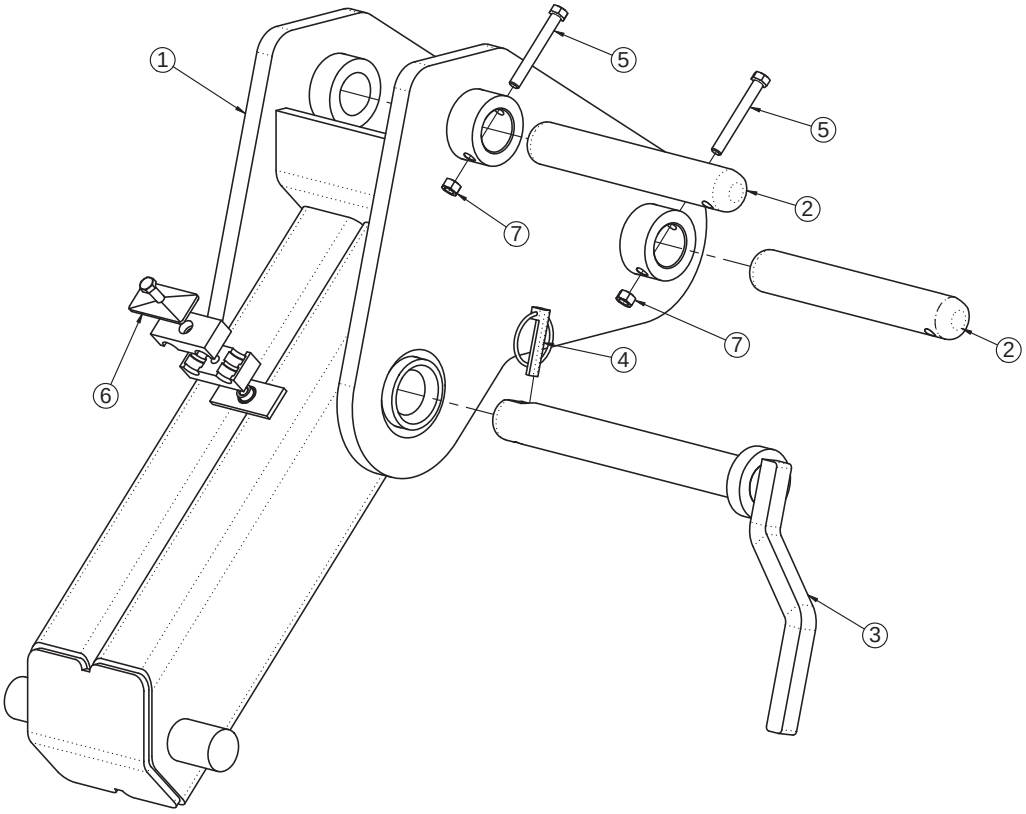
PROCEDURE	INTERVAL	NOTES
Check for hydraulic fluid leaks	Daily	Look at hose connections and hose fittings
Check bolt tightness	Daily	Torque 3/4'' nuts to 310 ft-lbs Torque 1'' nuts to 750 ft-lbs
Check for build-up around pivot areas	Daily	Remove ice, ground hay or any other debris from all pivot areas.

PARTS INDEX



PARTS INDEX	
PRODUCT MODEL: **GA**	DRAWING ID#: GA-S4 DRAWING REVISION: - DRAWING DATE: 12/2/2010

PARTS



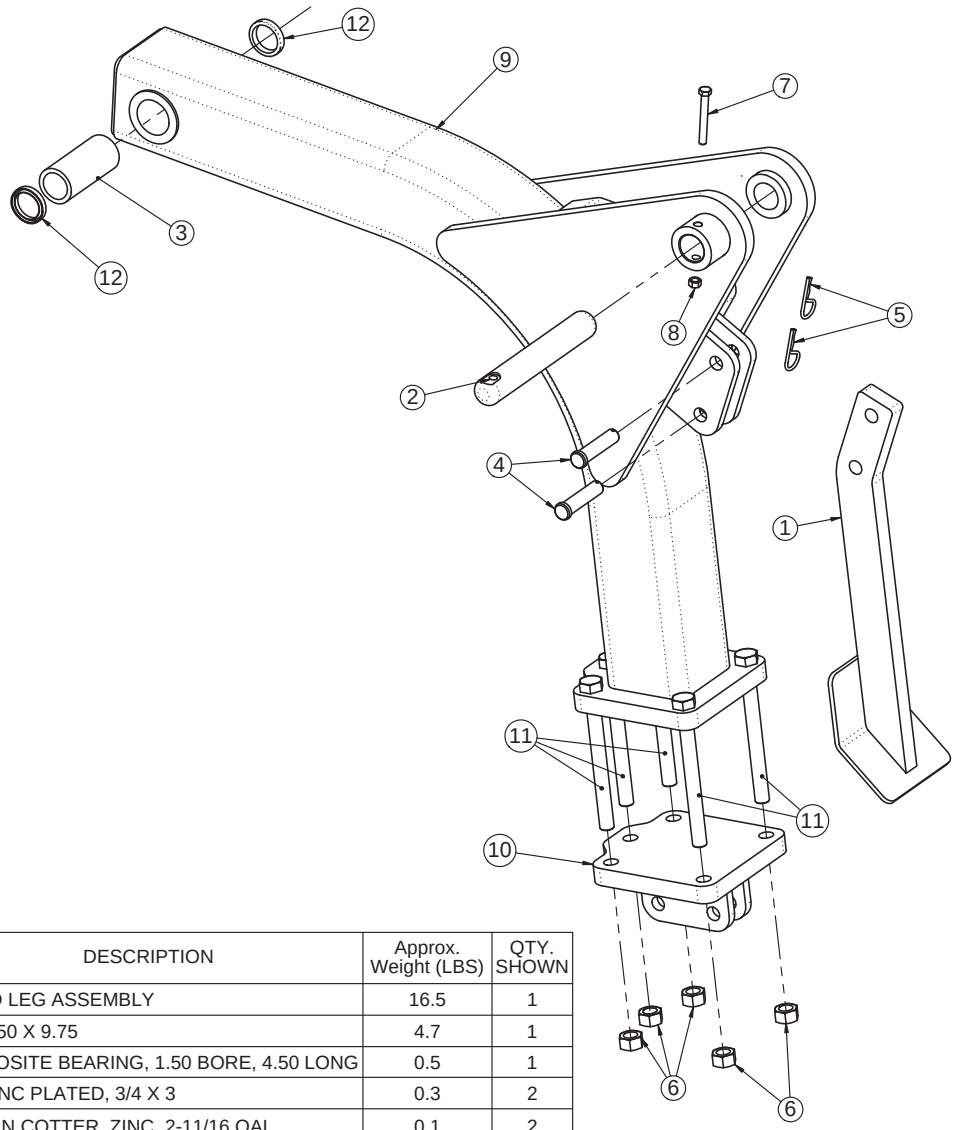
ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY. SHOWN
1	GA002	TORQUE TUBE	133.6	1
2	60230	PIN, 1.50 X 9.75	4.7	2
3	GA010	RETAINING PIN	8.5	1
4	98441	LYNCH PIN, 7/16 X 1-3/4	0.1	1
5	98202	BOLT, 3/8 X 3, GR8, ZP	0.1	2
6	90800	TWIN HOSE CLAMP	0.3	1
7	98006	NUT, 3/8-16 NYLOCK, ZP	0.1	2

TORQUE TUBE

PRODUCT MODEL: **GA**

DRAWING ID#: GA-S3
DRAWING REVISION: -
DRAWING DATE: 2/11/2009

PARTS



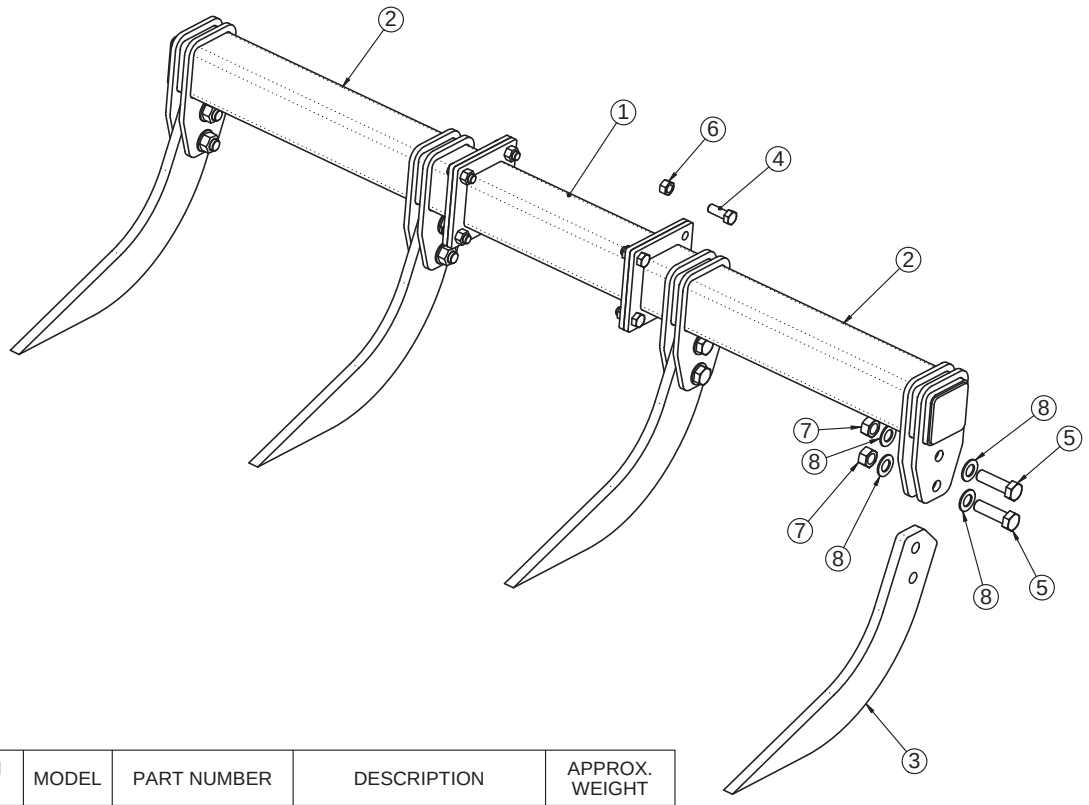
ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY. SHOWN
1	GA005	STAND LEG ASSEMBLY	16.5	1
2	60230	PIN, 1.50 X 9.75	4.7	1
3	98672	COMPOSITE BEARING, 1.50 BORE, 4.50 LONG	0.5	1
4	98401	PIN, ZINC PLATED, 3/4 X 3	0.3	2
5	98431	HAIRPIN COTTER, ZINC, 2-11/16 OAL	0.1	2
6	98015	NUT, 3/4-10 UNC TOP LOCK, PLATED	0.1	5
7	98202	BOLT, 3/8 X 3, GR8, ZP	1.2	1
8	98006	NUT, 3/8-16 NYLOCK, ZP	0.1	1
9	GA001	PIVOT ASSEMBLY	201.0	1
10	GA004	COMBO CLAMP PLATE	12.6	1
11	98208	BOLT, 3/4-10 UNC, GR8 ZN, 8" LONG	1.2	5
12	94222	PIN SEAL, 1.50 ID x 2.0 OD x 5/16 Thick	0.0	2

PIVOT ASSEMBLY

PRODUCT MODEL: **GA**

DRAWING ID#: GA-S4
DRAWING REVISION: -
DRAWING DATE: 12/2/2010

PARTS



ITEM NO.	MODEL	PART NUMBER	DESCRIPTION	APPROX. WEIGHT
1	GA90	GA926	CENTER TUBE, GA, 26"	79.2
1	GA96	GA932	CENTER TUBE, GA, 32"	94.0
1	GA84	GA920	CENTER TUBE, GA, 20"	64.4

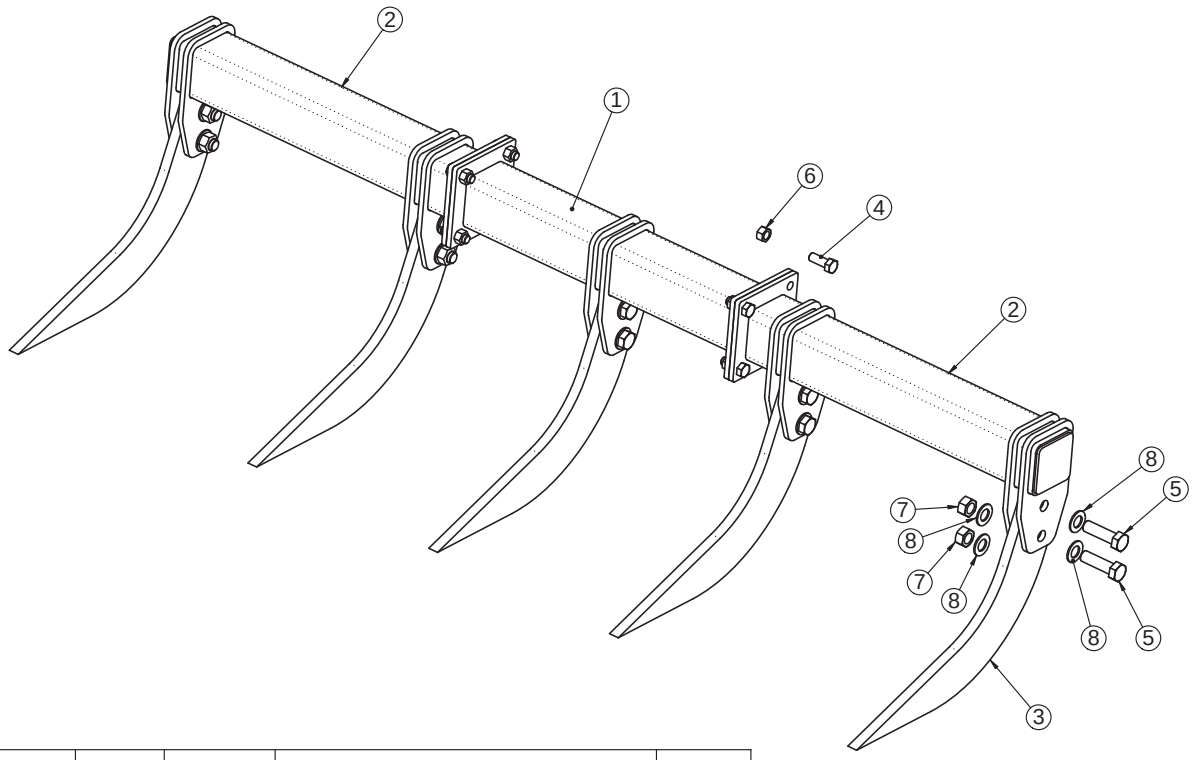
ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY SHOWN
2	GA003	TOOTH BAR	114.2	2
3	61221	TOOTH	33.8	4
4	98207	BOLT, 3/4-10 UNC, GR8 ZN, 2" LONG	0.1	8
5	98213	BOLT, 1-8 UNC, 3-1/2" GR8 ZP	0.1	8
6	98015	NUT, 3/4-10 UNC TOP LOCK, PLATED	0.1	8
7	98017	NUT, 1-8 UNC, TOP LOCK, ZN	0.1	8
8	98132	HARDENED WASHER, ZP, 3/4	0.1	16

TOOTH TUBE - 4 TOOTH MODELS

PRODUCT MODEL: GA

DRAWING ID#: GA-S3
DRAWING REVISION: -
DRAWING DATE: 2/11/2009

PARTS



ITEM NO.	MODEL	PART NUMBER	DESCRIPTION	APPROX. WEIGHT
1	GA905	GA926T	CENTER TUBE, GA, 26", WITH TOOTH	91.3
1	GA965	GA932T	CENTER TUBE, GA, 32", WITH TOOTH	106.1
1	GA102	GA938	CENTER TUBE, GA, 38"	120.9

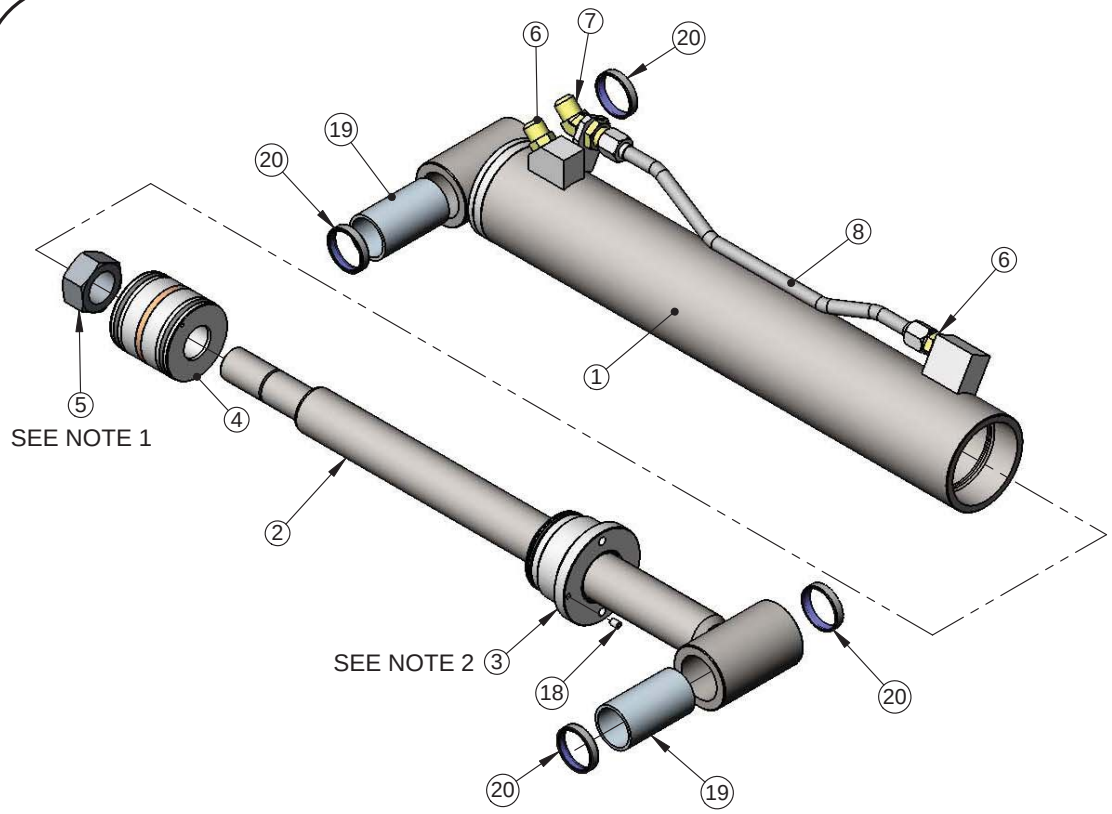
ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY SHOWN
2	GA003	TOOTH BAR	114.2	2
3	61221	TOOTH	33.8	5
4	98207	BOLT, 3/4-10 UNC, GR8 ZN, 2" LONG	0.1	8
5	98213	BOLT, 1-8 UNC, 3-1/2" GR8 ZP	0.1	10
6	98015	NUT, 3/4-10 UNC TOP LOCK, PLATED	0.1	8
7	98017	NUT, 1-8 UNC, TOP LOCK, ZN	0.1	10
8	98132	HARDENED WASHER, ZP, 3/4	0.1	20

TOOTH TUBE - 5 TOOTH MODELS

PRODUCT MODEL: GA

DRAWING ID#: GA-S3
DRAWING REVISION: -
DRAWING DATE: 2/11/2009

CYLINDER, GENERAL



NOTES:
1. PUT LIGHT OIL ON THREADS AND TIGHTEN TO 625-750 FT-LBS.
2. TIGHTEN GLAND TO 100-150 FT-LBS WHEN INSTALLING INTO TUBE.

ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY. SHOWN
1	GA123	TUBE ASSEMBLY (GA), AGILE	31.4	1
2	GA022	ROD ASSEMBLY	17.6	1
3	90158	GLAND, GA	3.10	1
4	90108	PISTON, GA	3.77	1
5	98018	TOP LOCK NUT, 1-1/4 -12 GR C	0.1	1
6	90510C	ADAPTER, -8 MJIC -6MORB	0.12	2
7	90513A	BULKHEAD ADAPTER W/NUT, 45 DEG. MJIC -08	0.35	1
8	GA024	FLUID LINE ASSEMBLY, GA	0.54	1
18	98712	SOCKET SET SCREW, CUP 1/4-20 X 3/8 LONG	0.0	1
19	98650	COMPOSITE BEARING, 1.50 BORE, 3.125 LONG	0.2	2
20	94223	PIN SEAL, 1.50 ID x 1.75 OD x 3/8 Thick	0.0	4

THE PART NUMBER FOR AN ASSEMBLED CYLINDER IS GA121. THE PIN SEALS (ITEM 20) AND BEARINGS (ITEM 19) MUST BE ORDERED SEPARATELY.

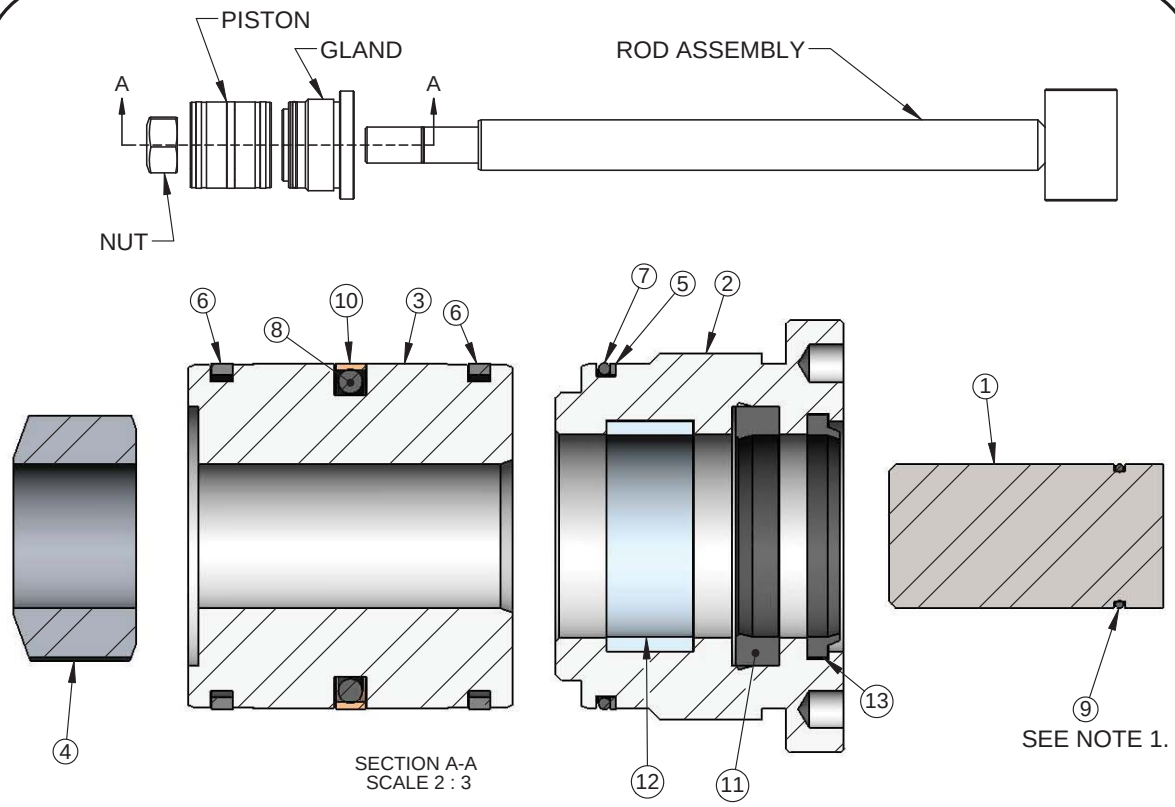
SEAL KIT FOR THIS CYLINDER (SEE NEXT PAGE FOR DETAILS) **PART # 94404**

GA121 CYLINDER PARTS, GENERAL

PRODUCT MODEL: GA

DRAWING ID#: GA121S
DRAWING REVISION: -
DRAWING DATE: 2/10/2009

CYLINDER, DETAIL



NOTES:
1. THE (2) SMALL BACK-UP WASHERS THAT COME IN THE SEAL KIT AND ARE THE SAME DIAMETER AS THIS O-RING ARE NOT NECESSARY IF THE GROOVE IN THE STEM OF THE ROD IS .095 WIDE. IF THE GROOVE IS .210 WIDE, THEN THE BACK-UP WASHERS ARE USED - ONE ON EACH SIDE OF THE O-RING.

ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY SHOWN	Included with Seal Kit 94404?
1	GA022	ROD ASSEMBLY	17.6	1	N
2	90158	GLAND, GA	3.10	1	N
3	90108	PISTON, GA	3.77	1	N
4	98018	TOP LOCK NUT, 1-1/4 -12 GR C	0.1	1	N
5	94105	BACK UP RING, -149, 3" OD	0.00	1	Y
6	94193	CAST IRON RING, 3" OD X 3/16" WIDE	0.02	2	N
7	94120	O-RING, -149, 2-13/16 ID X 3 OD, NITRILE 90A	0.00	1	Y
8	94119	O-RING, -333, 2-1/2 ID X 2-7/8 OD, NITRILE 90A	0.00	1	Y
9	94118	O-RING, -24, 1-1/8 ID X 1-1/4 OD, NITRILE 70A	0.00	1	Y
10	94155	POLYHONE (HYTREL), 3.0 OD	0.01	1	Y
11	94167	SEAL, DEEP-Z, 2-1/4 X 1-3/4	0.02	1	Y
12	94184	WEAR RING, ROD, 2" OD X 3/4" WIDE	0.02	1	Y
13	94213	WIPER, 1.750 ROD, TYPE "D"	0.01	1	Y

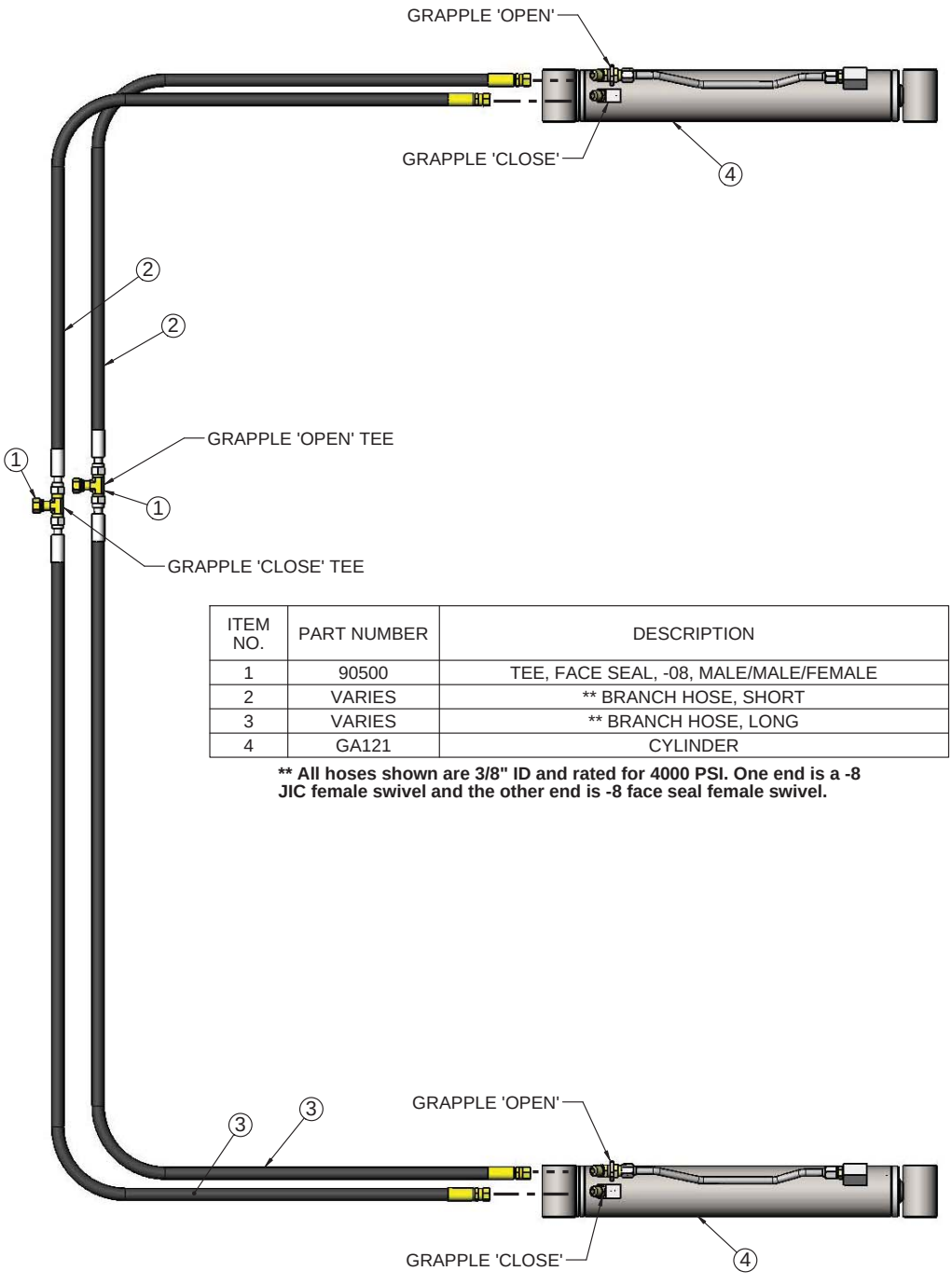
SEAL KIT FOR THIS CYLINDER **PART # 94404**

GA121 CYLINDER PARTS, DETAIL

PRODUCT MODEL: GA

DRAWING ID#: GA121S
DRAWING REVISION: -
DRAWING DATE: 2/10/2009

HOSE CONNECTIONS



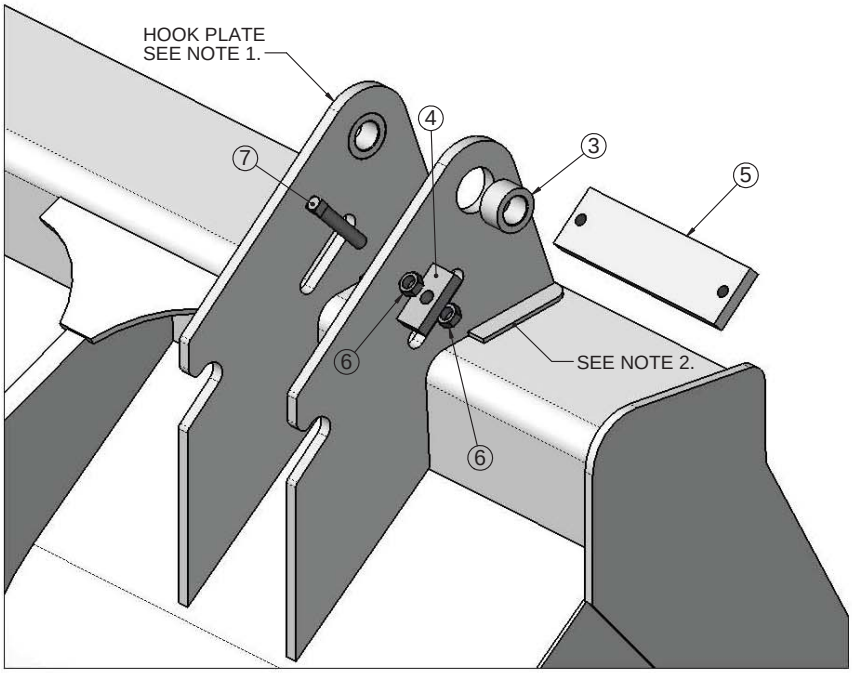
ITEM NO.	PART NUMBER	DESCRIPTION
1	90500	TEE, FACE SEAL, -08, MALE/MALE/FEMALE
2	VARIES	** BRANCH HOSE, SHORT
3	VARIES	** BRANCH HOSE, LONG
4	GA121	CYLINDER

**** All hoses shown are 3/8" ID and rated for 4000 PSI. One end is a -8 JIC female swivel and the other end is -8 face seal female swivel.**

HOSE CONNECTIONS

PRODUCT MODEL: GA	DRAWING ID#: GA-S3 DRAWING REVISION: - DRAWING DATE: 2/11/2009

MOUNT KIT PARTS



NOTES:
1. HOOK PLATES ARE CUSTOM FIT FOR EACH BUCKET AND MAY LOOK DIFFERENT THAN THOSE SHOWN HERE.
2. THIS IS A DOUBLER PLATE. NOT ALL MOUNT KITS INCLUDE A DOUBLER PLATE. THE MOST COMMON LOCATION FOR THE DOUBLER IS UNDER THE FRONT OF THE HOOK PLATES AS SHOWN, HOWEVER ON SOME BUCKETS THE DOUBLERS ARE UNDER THE REAR OF THE HOOK PLATES.

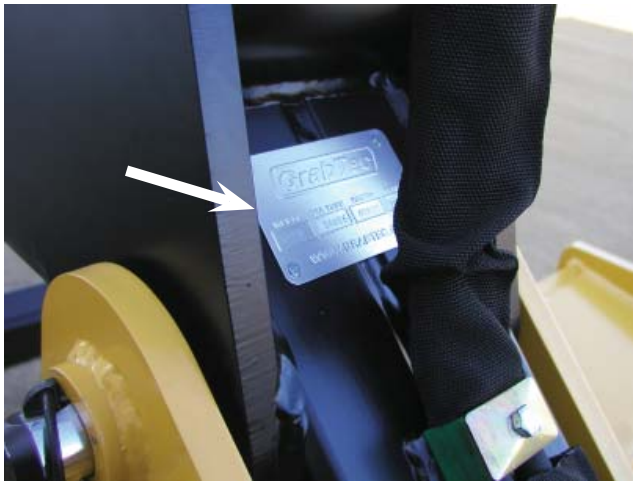
ITEM NO.	PART NUMBER	DESCRIPTION	Approx. Weight (LBS)	QTY SHOWN
3	60208	BUCKET LUG COLLAR	1.149	2
4	40098	BLOCK WITH HOLE	1.12	2
5	40097	SUPPORT PLATE, GA	9.55	1
6	98012	JAM NUT, 3/4 NC, ZN	0.2	4
7	98715	SET SCREW, 3/4 X 4, SQ. HEAD, CUP	0.6	2

MOUNT KIT

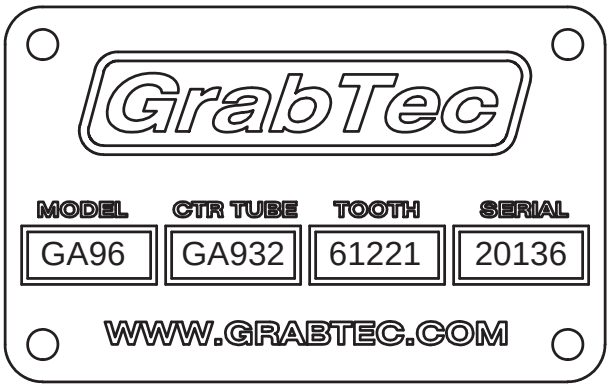
PRODUCT MODEL: GA

DRAWING ID#: GA-S3
DRAWING REVISION: -
DRAWING DATE: 11/28/2011

IDENTIFYING YOUR GRAPPLE MODEL & SERIAL



The Serial plate is typically found on the rear of the right side torque tube.



The serial plate shows the Model and Serial number of your grapple. The plate also shows the part numbers for a replacement Center tube or replacement tooth.

PRODUCT CHANGES AND SERIAL BREAK INFO

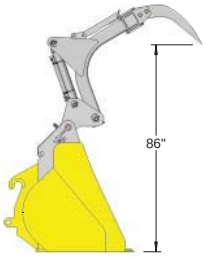
Revision ID	Models Affected	Starting Serial #	Ending Serial #	Revision Details	Parts Affected	See Pages
-	All GA's	18000	20136	None - original design	N/A	N/A
1 Jan '07	All GA's	20137	20178	Changed tooth bolts from 3/4 to 1"	Tooth, tooth bar, tooth bolts, nuts, washers and GA102 center tube	23,24
2 Apr '07	All GA's	20179	20221	Redesigned cylinder gland to utilize wear ring. Changed gland seal from standard u-cup style to deep-z style, which uses the same groove. Any cylinders from serial 20103-20178 can be updated with the new gland design.	Added Wear ring, Part 94183 Gland 90154 replaced with Gland 90157 Seal 94165 replaced with Seal 94167	-
3 Aug '07	All GA's	20222	-	Upgraded cylinder design from 4000psi rating to a 5000psi rating. Cylinders are interchangeable but nearly all cylinder parts and seals are different.	New complete cylinder part number is GA021. Previous complete cylinder number was GA011.	25,26
4 Feb '08	All GA's	20314	-	Added 5th hole and 3/4 x 7 bolt to combo clamp plate. Increased cylinder pivot pin size from 1.25" to 1.50".	Assemblies GA001, GA002, GA004. Composite bearings and pin seals in the cylinders sized for 1.50" pins, but the cylinders (part GA021) have not changed.	21,22,25
5 Nov '08	All GA's	20514	-	Support plate in mounts has tapped hole size increased from 5/8 NC to 3/4 NC. Lock pins that retain pins replaced by 3/8 x 3 Gr 8 bolts and nylock nuts.	Support plate 40097 and associated set screws & jam nuts. Harware that retains the 1-1/2" diameter pins.	21,22,28
6 Feb '09	All GA's	20595 (and 20584)	-	Switched cylinder supplier	Cylinder GA021 is now GA121. Cylinders interchangeable. Starting with serial 20610, the groove in the rod stem made narrower and back-ups rings for that o-ring are no longer required. Seal kits remain the same.	25,26
7 Jan '11	All GA's	21140	-	Increased combo clamp plate thickness from 1/2" to 1". Combo clamp plate bolt length increased from 7" to 8".	See Pivot Assembly drawing on Page 22. The thicker clamp plate is on both the Pivot Assembly and Combo Clamp Plate. The new longer bolts are 98208	22

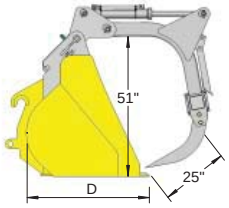
SPECIFICATIONS

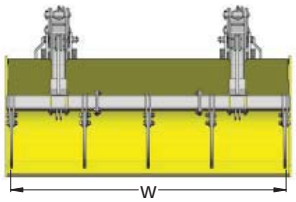
MODEL "GA"

APPLICABLE WHEEL LOADER BUCKET SIZE
2.5 - 4.25 YD³

APPLICABLE WHEEL LOADER OPERATING WEIGHT
26,000 - 40,000 lb.







Typical Loader Applications				
Case*	621	721		
Caterpillar*	928	930	938	950
Hyundai	757	760		
JCB	426	436		
John Deere*	544	624	644	
Komatsu*	WA250	WA320		
New Holland	W130	W170	W190	
Volvo	L60	L70	L90	

* Rear counterweight recommended for High-Lift machines under 30,000 lb.

General Specifications for Model 'GA' Grapple	
Max. Opening, Ground to teeth	86"
Number of Teeth available	4 or 5
Tooth thickness and material	1" T-1 steel
Teeth replaceable?	yes, each tooth secured by (2) 1" Gr. 8 bolts
Max. Clamping force at tips of teeth with 3750 psi	10,300 lb
Grapple opening time with 15GPM	2.7 sec (flow to cylinders is not restricted. Cylinders feature internal hydraulic cushioning at end of stroke in both directions)
Depth of typical bucket for proper fitment (see dimension "D" above)	38"-50"
Bore and stroke of cylinders	3.0 inch bore and 16.8" stroke
Cylinder Pressure rating	5,000 psi
Diameter of main grapple pivot pins	1.50"
Diameter of cylinder pivot pins	1.50"
Pivot pin bushing and seal info	Self-Lubricating, zero-maintenance, replaceable bushings with dust seals on each on of bushing.
Is Grapple designed for "split" operation if center section removed?	Yes. Grabtec also offers a Split Control Solenoid Kit for discrete control of each grapple half.
Custom fitment	Both the Quick-attach and Non Quick-attach models are custom designed for the bucket already on the wheel loader.
General type of steel used for grapple construction	T-1 (100,000 psi yield) and Grade 80 (80,000 psi yield)
Limited Warranty on Grapple material and workmanship	1 year or 2,000 hours, whichever comes first
Limited Warranty on pivot bushings	3 years or 5,000 hours, whichever comes first

'GA' QUICK-ATTACH MODELS			
MODEL	GRAPPLE WIDTH [W]	NO. of TEETH	INSTALLED WEIGHT
GA90	90"	4	1580 lbs
GA96	96"	4	1595 lbs
GA965	96"	5	1645 lbs
GA102	102"	5	1660 lbs

'GA' NON Quick-attach MODELS			
MODEL	GRAPPLE WIDTH [W]	NO. of TEETH	INSTALLED WEIGHT
GA90W	90"	4	1330 lbs
GA96W	96"	4	1345 lbs
GA965W	96"	5	1395 lbs
GA102W	102"	5	1410 lbs

WARRANTY

1242 Arizona Ave
Larchwood, IA 51241
712-477-2675
888-857-8952
712-477-2500 FAX

Grabtec warrants its grapples against faulty design, material, and workmanship for a period of one year from date of delivery or 2,000 hours, whichever comes first. The composite bushings located at cylinder and grapple pivot points are warranted against breakage or loss of their self-lubricating properties for three years or 5,000 hours, whichever comes first. Refer to the Maintenance section of the Owner's Manual for proper care and precautions concerning the pivot bushings. The warranted coverage on the grapples or pivot bushings is for the parts only, not for labor to disassemble or reassemble the grapple or to remove or reinstall the bushings or for shipping costs.

If Grabtec installs the mounts on the bucket, Grabtec warrants the mounts against faulty design, material, or workmanship for a period of one year from date of delivery or 2,000 hours, whichever comes first. If Grabtec does not install the mounts, Grabtec warrants the mounts against faulty material for a period of one year from date of delivery or 2,000 hours, whichever comes first.

If Grabtec provides mounts that were designed with information supplied by the customer, Grabtec will not warranty the mounts against improper fitment. Grabtec will make every effort to design mounts that fit with minimal reshaping, but accepts no responsibility for the customer's ability to take accurate measurements of the bucket. If Grabtec provides mounts based on the fact that the customer's bucket is one that Grabtec has previously designed mounts for, Grabtec accepts no responsibility on manufacturing tolerances or design changes to the bucket made by the bucket manufacture that result in mounts that do not fit without a significant amount of reshaping.

OEM components not manufactured by Grabtec are warranted by Grabtec against failure from improper installation for one year from date of delivery date. Examples of OEM components would be cylinders and cylinder components, hose clamps, hoses, and assembly hardware such as bolts and nuts.

Dealer labor rate charges on approved repairs shall not exceed 70% of dealer regular hourly rate. Overtime charges need prior written approval. Claims received 30 days past the repair date will not be considered for warranty.

Warranty is void if grapples are modified in any manner without PRIOR expressed written permission from Grabtec.

RETURN POLICY

1242 Arizona Ave
Larchwood, IA 51241
712-477-2675
888-857-8952
712-477-2500 FAX

RETURNED GOODS POLICY – PARTS

Items **SHIPPED** in error

Grabtec will accept returned items, with prior approval of Grabtec (see RGA paragraph below), within 30 days after shipment without a restocking charge, freight collect.

Items **ORDERED** in error

When parts are incorrectly ordered and returned to Grabtec, the customer is responsible for freight costs and a 15% restocking fee.

When parts are purchased without reference to a model or serial number and returned to Grabtec, the customer is responsible for freight costs and a 15% restocking fee.

RGA- Returned Goods Authorization

All return items must have prior approval of Grabtec and be assigned an RGA (Returned Goods Authorization) number by either the Grabtec sales or parts department and must be returned within 30 days of request.