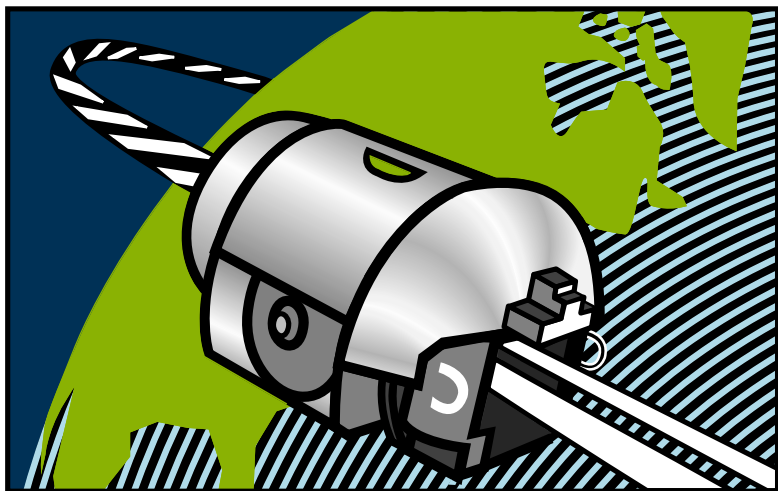


GMP®
APOLLO
L A S H E R



BUILT TO GO THE DISTANCE



Figure 1



GMP Apollo Lasher

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1.0 General

This manual covers the care, operation and maintenance of your GMP Apollo cable lasher, which you can use to lash cables up to 3.5 in. (89 mm) dia. to suspension strand, or smaller cable sizes to an existing lashed cable and strand. The Apollo has the capability to lash up to a 4 in. (100 mm) bundle of any assortment of innerduct, fiber, copper and coaxial cables as well. The strand sizes range from .25 to .38 in. (6 to 10 mm) diameter, inclusive.

This machine is intended for use only by properly trained journeyed linespeople or other craftspeople under the direct supervision and responsibility of those individuals.

As such, this manual's scope is specifically limited to the machine's functions, and no attempt is made to describe the proper procedures for placing and lashing aerial cable plant.

We cannot be held liable for any direct or indirect consequences arising from use of this product by any individuals not already properly trained in its use.

The following conventions will be used in the manual:

Warnings - must be followed to avoid bodily injury.

Cautions - must be followed to avoid damage to equipment

Notes - contain important information and useful tips on the operation of your Apollo lasher.

2.0 Precautions

2.1 Observe the following precautions when operating the Apollo lasher.

Read all of the instructions and save them for later reference. Before beginning any cable work, first check the cable run you want to make in order to find out what local conditions might be while you are lashing. Among the factors you should look for are:

- vehicle and pedestrian safety
- conditions of poles, anchors, guys and strand
- proper bonding and grounding of strand and attachments
- obstructions such as trees, limbs, and drop wires
- clearances and separations on poles shared by other utilities
- clearances over roads, driveways, walkways and crossings

Protect your work site with advance signalling devices at strategic points to warn traffic and pedestrians of any obstructions in the area.

Check your Apollo lasher first! Before using your machine, check to make sure it is in good repair, and all of the parts and mechanical assemblies are intact and in good working order. If your machine is not properly maintained, it might be unsafe to use and pose an unnecessary risk to both you and the property and personnel in your work area.

In case your Apollo lasher ever needs attention, you should forward it to our Lasher Department so it can get a professional repair and/or over-haul. (In case you are concerned about downtime, you should know our Department is set up to give you the fastest possible turnaround.)

Use the proper safety equipment! Before working aloft, inspect all your climbing and safety equipment to make certain it is in good repair. And while you are aloft, *ALWAYS* wear a safety belt with a safety strap securely attached to help prevent you from falling. Ensure the rear vertical cable rollers are set to their widest opening before placing the lasher on the side of a bucket.

Also, you should always raise and lower the Apollo lasher with a hand-line or a truck lift. *Use the bridle assembly at pole transfers!* When transferring your lasher around a pole or obstruction, use the bridle assembly as a tether to prevent damage to the machine in case it is dropped. Doing this lets you concentrate on your own safety rather than that of the machine.

Avoid abuse or rough handling of the Apollo lashers and *never* drop your lasher.

Keep your lasher in its protective case when not in use.

Protect your lasher from unnecessary exposure to dirt, grit and any other foreign matter.

Avoid placing the Apollo on the ground whenever possible.

3.0 Description

3.1 General

The following features make your Apollo lasher an outstanding value:

- parallel pull capability
- lightweight
- big bundle capacity
- constant tension in the lashing wire
- rotation section rotates in a single direction



Figure 2

Look at your Apollo lasher for a moment. You will see it consists of a rotating section supported on a stationary carriage: the strand and cable pass through this stationary carriage during the lashing operation.

As you look at the carriage you will see it has cable and strand rollers, front and rear gates, towing bracket and an anti-backroll strand roller on the front.



Figure 3

The components are made from a variety of materials, each selected to provide specific properties. Some of the materials are heat-treated aluminum alloys, magnesium, carbon and tool steel as well as engineered polymers. There are ball bearings or needle bearings on the drive shafts and rotating sections. Sintered metal bearings are used on other moving parts.

The machine weighs approximately 46 lbs (20.9 kgs.) without wire and provides an outstanding strength/weight ratio while providing an exceptionally long service life.

Note: Please see figures 31, 32, 33, and 34.

3.2 Cable capacities

You can use the Apollo to lash a single cable of almost any type, including telephone and fiberoptic cables up to 3.5 in. (89 mm) in diameter. The Apollo has the capability to lash up to a 4 in. (100 mm) bundle of any assortment of innerduct, fiber, copper and coaxial cables as well. The strand sizes range from .25 to .38 inch diameter (6.6M, 6M, 10M) or 6 mm through 10 mm.

3.3 Lashing wire

The Apollo lasher has two magazines for loading lashing wire, each can hold a 5.38 in. (137 mm) dia. by 1.81 in. (46 mm) high wire coil. You can use either of the standard wire coil sizes in the magazines: 1,200 ft. (365 m) of .045 in. (1.14 mm) dia. and 1600 ft. (488 m) of .038 in. dia. (0.97 mm) annealed stainless steel wire. Wax-coated wire is not a requirement, however, oiled wire is not recommended.

Your lasher can use a single wire or two wires simultaneously (also known as “double lashing”). Like other GMP lashing machines, the balance of the Apollo is not affected by the amount of wire loaded in either magazine.

Each magazine has two rollers for guiding and tensioning wire during lashing. The wire tension is developed by the routing of lashing wire and not the tension on the spool. The wire coils mount on a reel attached to the rotating drum. There is a non-adjustable tension on the reel to prevent overspinning. The lashing wire exits the tensioning rollers and enters the drive mechanism.

3.4 Drive mechanism

The Apollo is driven by the lashing wire exiting the machine so the lasher can be pulled from any direction. The lashing wire rotates drive wheels that are interconnected by a shaft so either single lashing or double lashing will rotate the lasher. A set of pinion gears drive a segmented ring gear and this configuration is the time-tested design found on other GMP lashers. The direct drive design eliminates the possibility of slippage.

A one-way clutch in the drive wheel of the gearbox assembly enables the rotation section to rotate in a single direction while lashing. This configuration allows the lashing wire to remain tensioned when forward motion of the lasher has ceased. The rotation section of the lasher can be manually rotated in the opposite direction by actuating the handle to de-clutch and disengage the drive wheel.

3.5 Adjustable rear gate and cable lifter

The rear gate is adjustable by the use of a D shaft and locking collar. The rear gate is easy and fast to use and the locking collar provides a positive lock to keep the rear gate in place.

To open the rear gate, push the button and the rear gate rotates to its open position. When the rear gate is open, the rotating drum will automatically lock in its detented position when the pin registers with the receptacle in the rotating housing. The pin is retracted from the receptacle in the rotating housing when the rear gate is closed.

3.6 Front gate

The front of the Apollo is designed to provide the maximum in cable protection. There are 4 rollers to help prevent cable damage regardless of cable orientation. The top roller has two one-way clutches that ensure the lasher only moves in the forward direction, providing anti-backroll capability. The bottom roller pivots out of the way for easy cable installation into the lashing machine, and locks positively in place for the cable lashing operation. There are two sets of towing eyes for the Apollo for pulling in any direction. The top set of holes is most suited for parallel pulling and normal operation and the bottom set is most suited for situations requiring more sideward or downward pull.

3.7 Bridle assembly

The Apollo lasher is supplied with a bridle assembly that resists rot. The 5 foot long rope assembly is equipped with a forged snap hook at each end and a floating forged steel ring between the snap hooks for the attachment of a suitable towing line. The bridle assembly also provides a safe and easy method to tether the Apollo while moving it around a pole or obstruction.

4.0 Operating instructions

4.1 General

As mentioned at the beginning of this manual, you should never operate a lasher unless you've been properly trained in advance or are being directed by a properly trained linesperson who is responsible for your work. However, you should find this section of the book helpful in outlining the correct sequence of steps to take in using your Apollo lasher.

4.2 Preparing a lashing wire coil

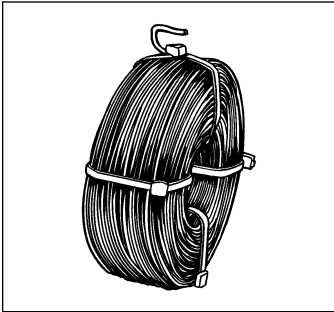


Figure 4

The first step in any lashing operation is to prepare the lashing wire coil. *Note: It is important that the lashing wire is loaded properly to ensure proper lasher operation.*

1. If the lashing wire is wrapped with wire ties, rotate the head of the wire tie attached to the looped end of the lashing wire to the center of the coil (see figure 4). This will facilitate the cutting of the wire tie in a later step and help ensure that the complete wire tie is removed.
2. Do not cut all of the cable ties! Leave the cable tie attached to the looped end of the lashing wire, and cut the remaining 3 cable ties on the lashing wire coil.
3. Cut the looped end of the wire on the inside diameter of the wire coil. This step will help in the loading of the coil onto the hub and subsequent steps.

4.3 Install the prepared wire coil

The proper installation of the wire coil is a must for hassle-free lashing. Many of the problems in lashing can be traced to improper preparation of the lashing wire coil.



1. Open the cover with a screwdriver or 7/16 in. socket as found on the 216C tool, or any tool used to tighten the bugnut. Turn the fastener 1/4 turn (counterclockwise) until the fastener unseats. The spring loaded cover should open to expose the lashing wire reel.



Figure 6

2. Verify that the adjustable tension roller is in the correct position for the type of lashing. The roller should be in the lower-most position for normal lashing wire tension, including lashing broadband coaxial cables. The roller should be in the upper-most position for higher lashing wire tension.

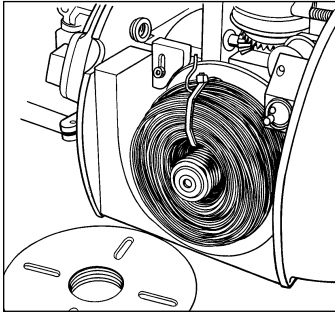


Figure 7

3. Depress the reel brake into cutout on rear flange. Unscrew and remove the wire reel cover and slide the lashing wire coil over the hub and onto the reel keeping the free end of the wire towards the front of the machine.

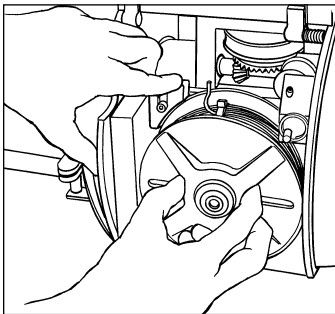


Figure 8

4. Install the wire reel cover and thread completely onto the reel until snug against the wire coil. It is important to ensure that the reel cover is tight against the wire coil to prevent the lashing wire from “snagging” on itself.

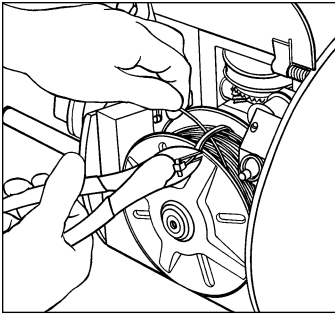


Figure 9

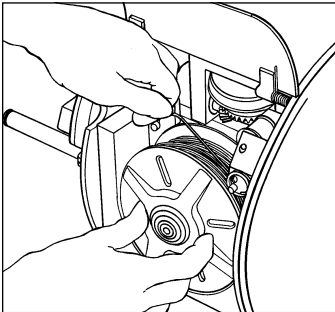


Figure 10

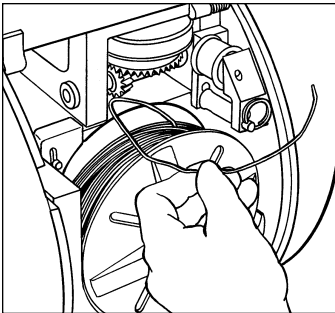


Figure 11

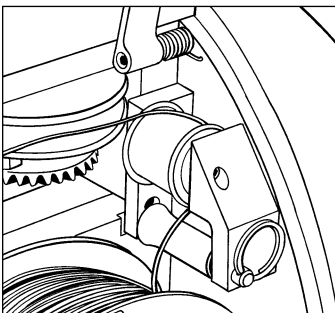


Figure 12

5. Hold on to the looped end of the coil. Cut and remove the remaining cable tie and then continue to snug the reel cover against the wire coil ensuring a tight fit. The reel brake can be depressed into cutout on rear flange to hold the reel stationary as you tighten the reel cover. Make certain that the head or knot on the cable tie is not pulled through the coil and that the entire cable tie is removed, because portions of the cable tie may cause snagging of the lashing wire.

Note: As a check for proper cover tightness, at least 1 full thread on the hub should be exposed after the wire reel cover has been installed and tightened.

6. Make a hook with the end of the lashing wire. Feed the wire over the first tension roller (bottom roller).
7. Feed the wire behind the second tension roller (top roller). Pull the wire out from behind the roller.
8. Pull up on the handle to de-clutch and disengage the drive wheel.

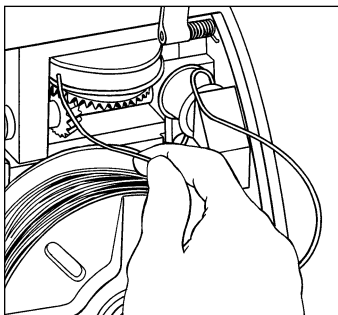


Figure 13

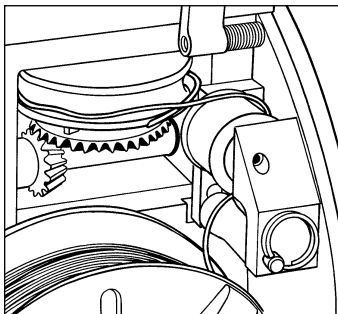


Figure 14

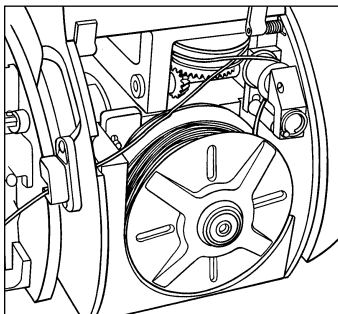
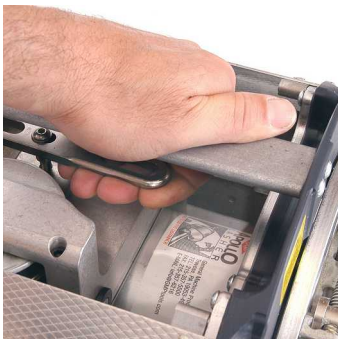


Figure 15

9. Feed the wire into the drive wheel from the rearward direction so the wire moves around the drive wheel toward the front of the lasher.

10. Continue feeding wire until it exits the drive wheel. The wire exiting the drive wheel must be below the wire entering the drive wheel.



11. Pull up on the handle to disengage the drive wheel and feed wire into the exit rollers on the end of the machine.



Figure 17

12. Ensure the wire is captivated between the roller and the housing.
13. If more wire is needed, disengage the drive wheel to pull out more lashing wire. (See Figure 16)

14. Close the cover and using a screwdriver or 7/16 in. socket as found on the 216C tool, or any tool used to tighten the bugnut, tighten the fastener (clockwise) 1/4 turn until the fastener seats and can't be tightened further. Ensure that the cover is secure to the hub.

4.4 Lashing to bare suspension strand

1. Check the lashing wire coils to ensure there is enough lashing wire for the span, if the lashing wire wasn't loaded recently.



Figure 18

2. Lower the rear gate to its lowest position. Ensure that the rear gate is open and the drum is locked in position.
3. Set the rear vertical cable rollers to their widest opening.
4. Open both the front and rear strand locks by pulling up on the release knob. There should be an audible "click" when the locks travel from the locked position to the open position. (See Figure 18)



Figure 19

5. Open the front gate by actuating the release lever towards the front of the lashing machine. The roller on the front gate will pivot 180 degrees and out of the way.
6. Attach a handline to the lasher handle and raise the lasher to the strand. Attach one of the lasher bridle snap hooks to one of the lasher towing eyes. Attach the other snap hook to the strand to serve as a tether.

7. Place the lasher on the strand and ensure that the strand is centered in the grooves of both of the front and rear rollers.



Figure 20

8. Close the front strand locks by depressing simultaneously on both hooks until audibly and visibly locked.
9. Close the rear strand locks by simultaneously depressing on both hooks until audibly and visibly locked. The lasher is now secured to the strand.

10. Using the proper cable raising procedure for your application, lift the cable or cables up to the strand, close the front gate and let the cable(s) rest on the horizontal roller.
11. Adjust the position of the vertical rollers on the rear gate so that they barely touch the sides of the cable(s). This step will have to be done every time the bundle size changes.
12. Close the rear gate until it locks in its detented position.
13. Raise the rear cable lifter by pushing up on the bottom of the lifter that contacts the D shaft. The lock doesn't have to be activated to raise the cable lifter. If the rear cable lifter is too high, press the locking lever to lower the rear cable lifter and try again.

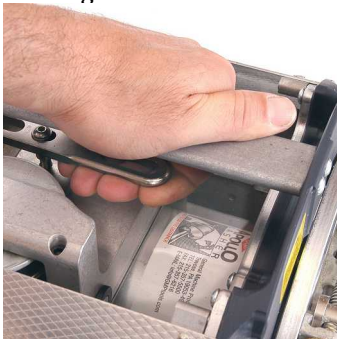


Figure 21

14. Now the final steps. Pull up on the handle to de-clutch and disengage the drive wheel to pull some lashing wire from the lasher. Secure the lashing wire to the strand by using a GMP D or E lashing wire clamp. Attach the bridle assembly to the towing eyes on the Apollo lasher and you are ready to lash.

See section 4.6 for more information on terminating lashing wire.

4.5 Over-lashing procedure

Here is the proper way to overlash onto existing cable installations using the Apollo lasher:

1. Check the lashing wire coils to ensure there is enough lashing wire for the span.
2. Lower the rear gate to its lowest position by fully depressing the thumb latch and sliding the roller down. Ensure that the rear gate is open and the drum is locked in position.



Figure 22

3. Open both the front and rear strand locks by pulling up on the release knob. There should be an audible “click” when the strand locks travel from the locked position to the open position. *The strand locks aren’t used in the over-lashing procedure and should remain in the open position.*



Figure 23

4. Open the front gate by actuating the release lever towards the front of the lashing machine. The roller on the front gate should pivot 180 degrees and out of the way.
5. Attach a handline to the lasher handle and raise the lasher to the strand.
6. Attach one of the snap hooks on the lasher bridle to one of the towing eyes. Attach the other snap hook around the strand and existing cables to serve as a tether.
7. Place the lasher on the strand and ensure that the strand is centered in the grooves of both of the front and rear rollers.
8. Using the proper cable raising procedure for your application, lift up to the strand the cable or cables you want to lash, close the front gate and let the cable(s) rest on the horizontal roller.

9. Raise the rear cable lifter by pushing up on the bottom of the lifter that contacts the D shaft. The thumbblatch doesn't have to be activated to raise the cable lifter.
10. Adjust the position of the vertical rollers so that they barely touch the sides of the cable(s). This will have to be done as the bundle size changes.

See section 4.6 for more information on terminating lashing wire.

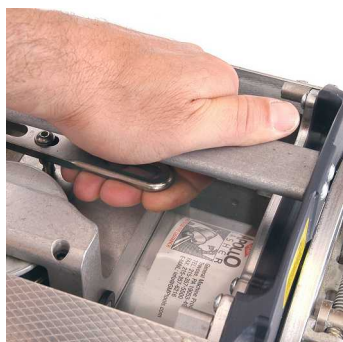


Figure 24

11. Now the final steps. Pull up on the handle to de-clutch and disengage the drive wheel to pull some lashing wire from the lasher. Secure the lashing wire to the strand by using a GMP D or E lashing wire clamp. Attach the bridle assembly to the towing eyes on the Apollo lasher and you are ready to lash.

4.6 Lashing wire termination

4.6.1 General

A common cause of lashing wire failure is improper termination. The following steps outline the suggested method for proper lashing wire termination.

1. Lashing wire termination should be accomplished and cable supports installed as soon as practical after the cable is placed.
2. Measurement marks made in making terminations should be made on the strand rather than on the cable sheath. Avoid scoring the cable sheath with the lashing wire end when terminating lashing wire.
3. Cable guards should be used to prevent abrasion of the cable sheath where the separation is less than 1/2 inch between the cable and suspension clamps.

While the D lashing wire grip and D and E lashing wire clamps may be used on strand sizes up to and including 7/16 in (11mm) (16M) or larger, the discussion on lashing wire termination will only cover the strand sizes of .25 to .38 in. diameter (6 to 10 mm) (6M, 6.6M and 10M), the only strand sizes compatible with the Apollo lasher.

4.6.2 Lashing wire termination

1. Secure the lashing wire to the strand with a lashing wire grip before cutting or otherwise releasing tension in the lashing wire. The lashing wire grip should be placed far enough from where the supports, spacers and lashing wire clamps are to be installed to avoid having to move the grip.

Note: The situation can exist where the .038 in. (0.97 mm) dia. lashing wire may nest in the space between the wires of the 10M strand. Ensure that the D lashing wire grip is securely contacting both the lashing wire and the strand to prevent loss of tension in the lashing wire.

4.6.3 Lashing wire clamps

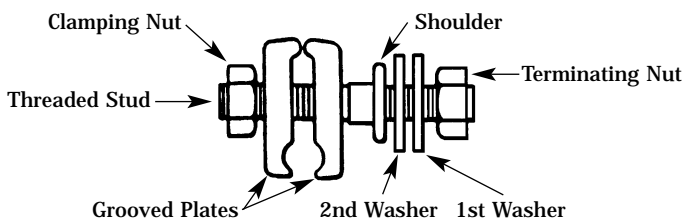


Figure 25, D Cable Lashing Clamp

See figure 25

1. The D or E lashing wire clamp may be used with .038 (0.97 mm) and .045 (1.1 mm) dia. lashing wire on strand sizes of .25 to .38 in. (6 to 10 mm) diameter (6M, 6.6M and 10M).
2. The nuts of the clamp are tightened and loosened with the 7/16 in. end of a 216C tool or B ratchet wrench.

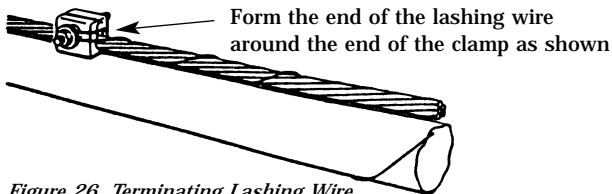


Figure 26, Terminating Lashing Wire

4.6.4 Terminating lashing wire using D or E lashing wire clamps

See figure 26 for steps 1, 3 and 4.

1. The lashing wire clamp should be located 2 inches outside of the first lashed cable support or cable suspension clamp. The lashing wire should be wrapped twice around the strand and then terminated on the cable lashing clamp.

See figure 25 steps 2, 3, 5 and 6.

2. Terminate one lashing wire using a lashing wire clamp by placing the wire below the stud and between the second washer and stud shoulder.
3. Remove any slack in the lashing wire by maintaining tension on the wire and tapping the strand sharply. Form the wire over the stud and tighten the nut. Cut the free end of the lashing wire off 1/4 in. (6 mm) beyond the end of the clamp.
4. Form the end of the lashing wire 90 degrees around the end of the clamp to minimize exposure of the free end of the lashing wire.
5. Terminate a second lashing wire (if used) with the D lashing wire clamp as outlined above; however, temporarily clamp the first lashing wire using a D lashing wire grip to maintain lashing wire tension.
6. Loosen the nut on the lashing wire clamp and terminate the second lashing wire between the first and second washers. Tighten the nut to complete the termination.
7. Remove the D lashing wire grip(s).

4.7 Moving your lasher around a pole

When you need to move your Apollo lasher around a pole or other obstruction, follow these steps.

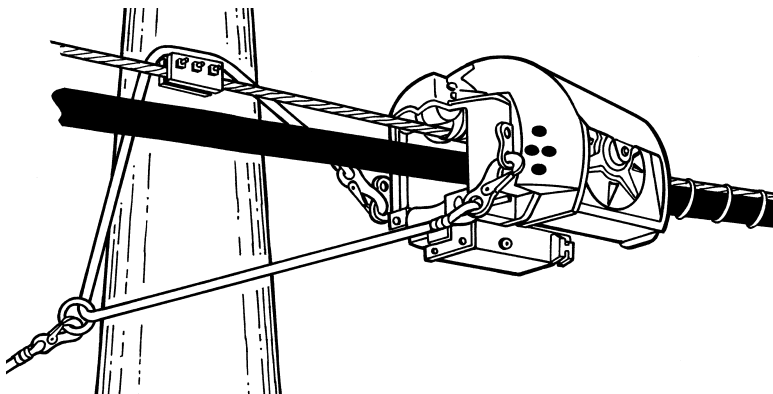


Figure 27

Warning: While aloft, **ALWAYS** wear a safety belt with a safety strap securely attached to help prevent you from falling.

Caution: Ensure the rear vertical cable rollers are set to their widest opening before placing the lasher on the side of a bucket.

- ▲** 1. Before doing anything, make sure you are working from a secure perch where you can safely move your Apollo lasher without overreaching. This is extremely important.

See section 4.6 for more information on terminating lashing wire.

2. Clamp the lashing wire to the strand.
3. To pull a length of lashing wire from the Apollo lasher without rotating the drum, actuate the de-clutch lever and pull out enough lashing wire from your machine so you can terminate it with a clamp or continue lashing past the obstruction.
4. Attach one of the lasher bridle snap hooks to a lasher towing eye on the front of the machine.
5. Now pass the bridle under the strand, past the obstruction and attach the other snap hook to another lasher pulling eye.



Figure 28

6. Open the front gate by actuating the release lever towards the front of the lashing machine. The roller on the front gate will pivot 180 degrees and out of the way.



Figure 29

7. Open the rear gate making sure it is fully open in the detented position.
8. Open both the front and rear strand locks by pulling up on the release knob. There should be an audible “click” when the locks travel from the locked position to the open position.



Figure 30

9. Carefully lift the lasher off the strand and move it over to the strand on the other side of the obstruction. If you accidentally drop the lasher while making this transfer, the bridle assembly will keep the lasher from falling to the ground.

4.8 Removing the lasher from the strand

The procedure for taking your lasher off the strand is basically the same as for moving it around a pole, except that you should also:

1. attach a secured handline to the lasher handle;
2. disconnect the lasher bridle only after completing step 1; and
3. carefully lower the lasher to the ground.

5.0 Troubleshooting

5.1 General

Most problems you encounter while operating your Apollo lasher have simple solutions. Read through the section to find your problems, then follow the recommended steps. If you can't solve the problem, then call the factory.

Problem: The lasher won't rotate.

Is the rear gate closed?

If not, close the rear gate.

Is the lashing wire routed properly? Check Figure 14.

If not, reroute the wire properly.

Is the lashing wire snagged on a pulley?

If so, free wire and reroute the wire.

Is the lashing wire pulled through itself?

If so, remove wire until the wire reel is straightened out again.

Is the lashing wire of proper dimension? Is it .038 in. (.9 mm) diameter or .045 in. (1 mm) diameter or is it larger?

If the wire diameter is incorrect, use the correct wire size.

Problem: The lashing wire is too tight or too loose.

Is the tensioning roller set at the correct position?

If not, move the roller to the correct position. (See Figure 6)

Problem: The rotation section needs to be rotated in the opposite direction to clear a jam or remove a foreign object from the lasher.

The rotation section of the lasher can be manually rotated in the opposite direction by actuating the handle to de-clutch and disengage the drive wheel. The rotation section can be rotated bi-directionally as long as the drive wheel is disengaged.

6.0 Maintenance

6.1 General

It is easy to care for the Apollo and keep it in good operating condition, but to make sure it stays in adjustment and operates properly, always follow these simple precautions:

Never drop your lasher or expose it to any kind of abuse.

Keep your lasher in its protective case when not in use.

Protect your lasher from unnecessary exposure to dirt, grit and any other foreign matter.

Avoid placing the Apollo on the ground whenever possible.

6.2 Preventative maintenance

Lubricate the following points with a white lithium grease on a periodic basis:

- D shaft and locking collar
- rear vertical roller shaft and trunions
- vertical rollers
- front gate roller shaft
- front gate spring
- rear gate roller shaft
- bevel gears
- ring gear and pinion gears
- needle bearings

- strand lock shaft and springs

Caution: If your Apollo lasher doesn't rotate freely, have it repaired at the GMP facility.

6.3 Maintenance notes

The front and rear gates should swing freely without binding and securely latch when closed. Likewise, the spring on the front and rear gates should keep them open unless intentionally closed. The towing bracket is designed to be an integral part of the safety of the Apollo lasher when it is being transferred. So, inspect the towing bracket for cracks or other degradation. Check the screws to ensure their tightness. Check the bridle assembly for wear or rope strand breakage. Verify proper functioning of the forged snap hooks. Check the loose ring to make sure it isn't bent or damaged. The tensioning rollers should rotate freely without binding. The screws and nuts on your lasher should be checked periodically for tightness. Check all of the rollers for signs of abnormal wear.

6.4 Scheduled maintenance

The Apollo should be returned to the factory every 10-12 months for an inspection and "tuneup."

7.0 Options and other miscellaneous information

7.1 General

The Apollo lasher has been designed to minimize the snag and catch points and therefore requires no optional halo.

7.2 GMP lashing accessories

The following items will help to increase your productivity and bottom line.

Description	Item
D lashing wire grip	08605
D lashing wire clamp (100/pack)	07886
E lashing wire clamp (100/pack)	81460
lashing wire .045 430 SS 1200 ft/spool, 6 spools/ctn	71530
lashing wire .045 302 SS 1200 ft/spool, 6 spools/ctn	71533
lashing wire .038 302 SS 1600 ft/spool, 6 spools/ctn	71535
polypropylene lashing tow rope 3/8 in. dia by 35 ft.	70190
bridle assembly 5 ft.	05817
216C tool	15439
B ratchet wrench	07511

7.3 Other available GMP products

Did you know that GMP is the world's oldest and largest supplier of aerial tools and accessories? In fact, our selection and quality have always been second to none. We helped invent many of the aerial tools you use everyday, including aerial lashers like the C2, J2 and G, and a broad line of cable blocks and rollers. And it doesn't stop there. We provide tools and accessories for almost every cabling function: aerial, underground, even in-building. Chances are, if you are looking for a tool, we have it, and many more like it as well. Contact us for our catalog that lists our complete selection of over 800 products.

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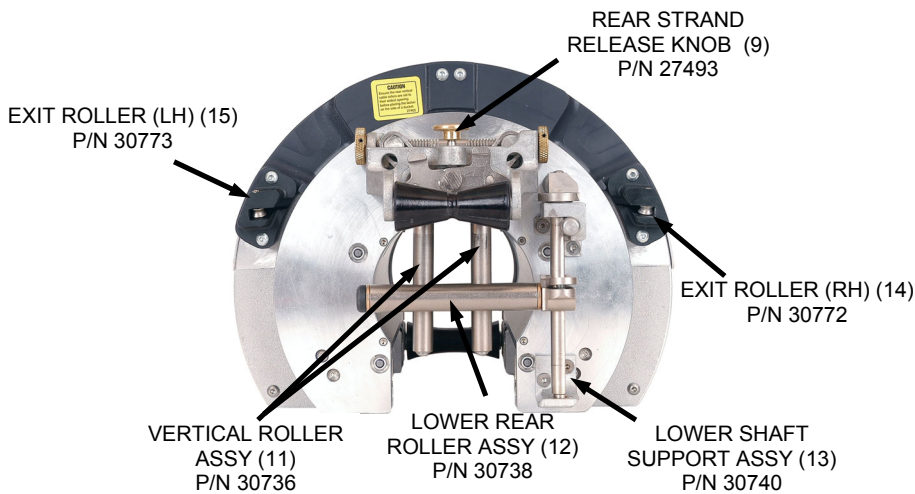
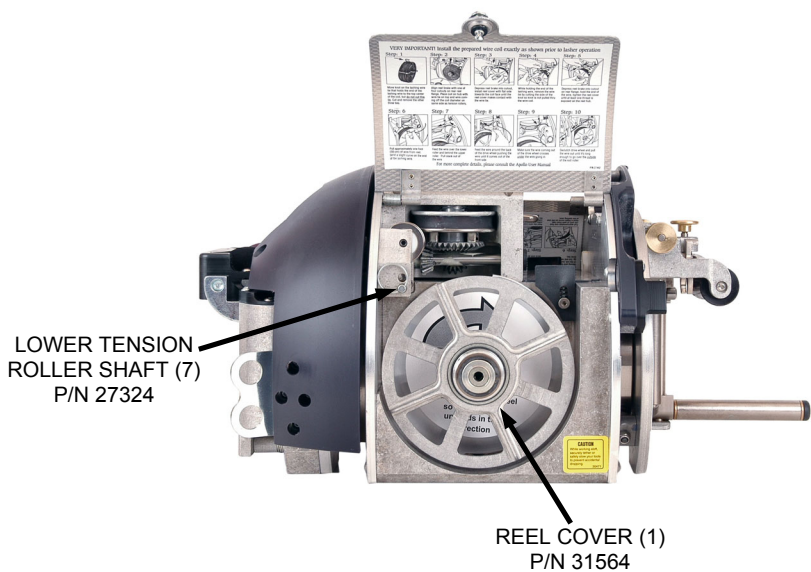
8.0 Repair/Replacement parts list

If the need for repair parts should arise please contact the factory for genuine GMP replacement parts.

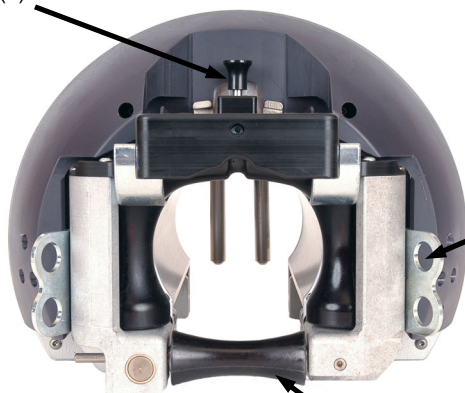
Please see photos 31, 32, 33, and 34. The following are available as replacement parts. The rollers listed below contain the required bushings or bearings.

Loc.	Description	Item	Qty.
*	Lower Tension Roller	26958	2
*	Bushing, Lower Tension Roller	27072	4
*	Strand Lock Spring	27087	2
1	Reel Cover	31564	2
*	Strand Lock Plunger	31517	2
*	Strand Lock Axle, Front (1 5/16")	31528	1
2	Towing Bracket	27170	2
3	Front Strand Release Knob	31530	1
4	Lower Front Roller (3 5/16")	27290	1
*	Upper Tension Roller Bearing	27301	2
*	Upper Tension Roller	27302	2
5	Door Assy LH	27312	1
6	Door Assy RH	27313	1
7	Lower Tension Roller Shaft	27324	1
8	Front Roller w/o Clutch (3 5/8")	27461	1
9	Rear Strand Release Knob	27493	1
*	Rear Hinge Pin Cover Door	30572	2
*	Front Hinge Pin Cover Door	30573	2
*	Drag Brake Assy	30684	2
10	Rear Roller Assy (3")	30735	1
11	Vertical Roller Assy (3 1/2")	30736	2
12	Lower Rear Roller Assy (4 11/16")	30738	1
13	Lower Shaft Support Assy	30740	1
14	Exit Roller Assy RH	30772	1
15	Exit Roller Assy LH	30773	1

* **Not visible in photograph**



FRONT STRAND
RELEASE KNOB (3)
P/N 31530



TOWING
BRACKET (2)
P/N 27170

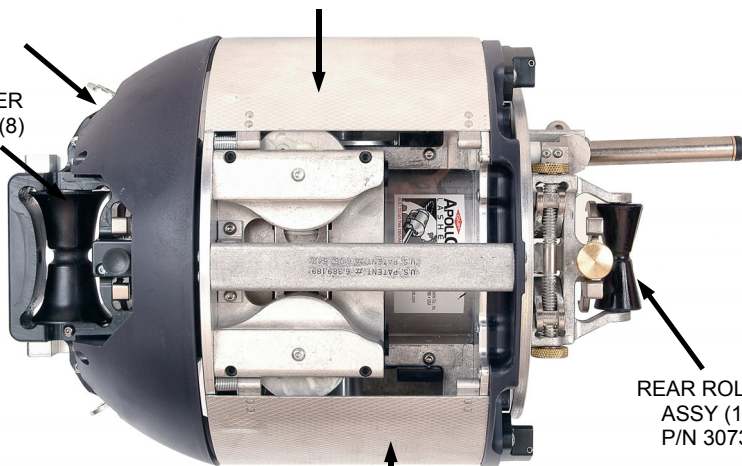
LOWER FRONT
ROLLER (4)
P/N 27290

Photo 33, Front View

TOWING
BRACKET (2)
P/N 27170

DOOR ASSY LH (5)
P/N 27312

FRONT ROLLER
W/O CLUTCH (8)
P/N 27461



REAR ROLLER
ASSY (10)
P/N 30735

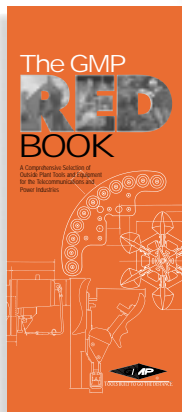
DOOR ASSY RH (6)
P/N 27313

Photo 34, Top View

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