



## Two-Section, Hydraulic Folding Marker

### Used with:

- 2SF24, 24-Foot Two-Section Drill
- 2SF30, 30-Foot Two-Section Drill
- 2SBM30, 30-Foot Bean Machine
- 2SNG24, 24-Foot Two-Section Native Grass Drill
- 2SNG30, 30-Foot Two-Section Native Grass Drill



*When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!*

## General Information

These instructions explain how to install the flat-fold marker on the 24- or 30-foot, two-section folding drill. The hydraulically operated markers leave a line for you to follow on the next field pass. Dual markers are equipped with a sequence valve for easy operation.

These instructions apply to:

113-196A	30-Ft, Single Hydraulic Flat Fold Marker
113-197A	30-Ft, Dual Hydraulic Flat Fold Marker
113-200A	24-Ft, Single Hydraulic Flat Fold Marker
113-201A	24-Ft, Dual Hydraulic Flat Fold Marker
113-283A	30-Ft Bean Machine Dual Hydraulic Marker

### Manual Update

Refer to the drill operator's manual for detailed information on safely operating, adjusting, troubleshooting and maintaining the markers. Refer to the parts manual for part identification.

- 2SF24 and 2SF30 Solid Stand Operator's Manual. . . . . 115-015M
- 2SF24 and 2SF30 Solid Stand Parts Manual. . . . . 115-015P
- 2SBM30 Soybean Machine Operator's Manual . . . . . 173-086M
- 2SBM30 Soybean Machine Parts Manual . . . . . 173-086M
- 2SNG24 & 2SNG30 Two-Section Native Grass Operator's Manual. . . . . 202-499M
- 2SNG24 & 2SNG30 Two-Section Native Grass Parts Manual . . . . . 202-499P

### Before You Start

Starting on page 6 are detailed lists of parts included in the marker packages. Use these lists to inventory parts received.



### CAUTION!

*You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail. Never allow anyone near the drill when folding or unfolding the markers.*



### WARNING!

*Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene will result.*

# Assembly Instructions

## Marker Assembly

Refer to Figure 1.

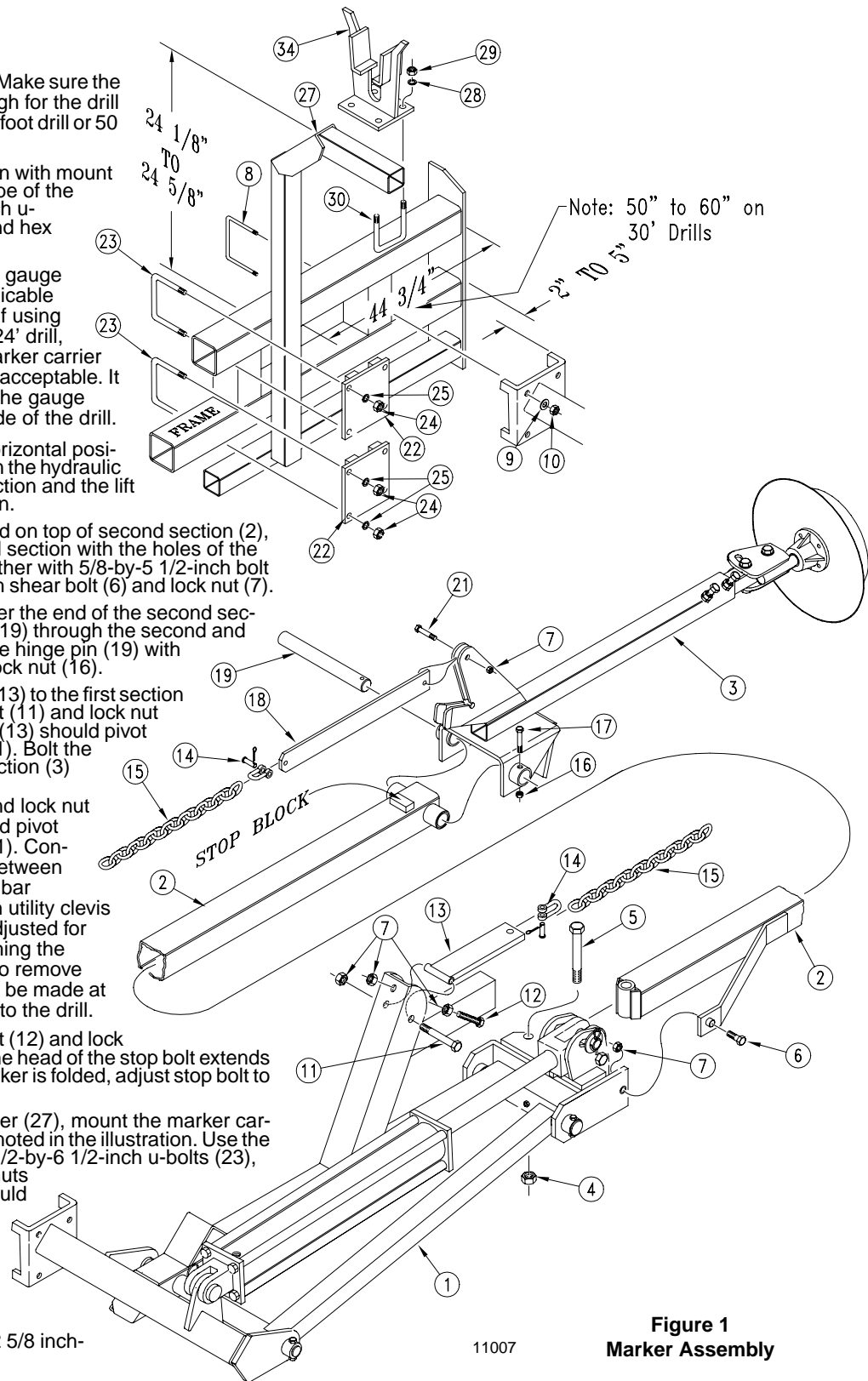
1. Lower drill into field position. Make sure the assembly area is large enough for the drill and markers (62 feet for a 30-foot drill or 50 feet for a 24-foot drill).
2. Attach the marker first section with mount (1) to the lower 3 1/2-inch tube of the drill frame. Mount the 5/8-inch u-bolts (8), lock washers (9) and hex nuts (10).

NOTE: On 24-foot drills with dual gauge wheels, markers may not be applicable due to problems with clearance. If using markers on a dual gauge wheel 24' drill, mounting the markers and the marker carrier arm on the top frame tube will be acceptable. It may also be necessary to move the gauge wheel assembly towards the inside of the drill.

3. Assemble the marker in a horizontal position. Remove the port plugs in the hydraulic cylinder then fold the first section and the lift lug (1) to a horizontal position.
4. With the stop block positioned on top of second section (2), align the holes of the second section with the holes of the first section (1) and bolt together with 5/8-by-5 1/2-inch bolt (5), lock nut (4), 3/8-by-2-inch shear bolt (6) and lock nut (7).
5. Place the third section (3) over the end of the second section (2) and insert hinge pin (19) through the second and third section pivot. Secure the hinge pin (19) with 1/4-by-2-inch bolt (17) and lock nut (16).
6. Bolt the chain bar weldment (13) to the first section (1) with 3/8-by-3 1/4-inch bolt (11) and lock nut (7). The chain bar weldment (13) should pivot freely on the 3/8-inch bolt (11). Bolt the chain bar (18) to the third section (3) with the 3/8-by-1 1/2-inch bolt (21) and lock nut (7). The chain bar (18) should pivot freely on the 3/8-inch bolt (21). Connect the marker chain (15) between the chain bar (18) and chain bar weldment (13) with 5/16-inch utility clevis (14). With the marker disk adjusted for seeding width and disk touching the ground, adjust chain length to remove the slack. Adjustment should be made at the utility clevis (14) nearest to the drill.
7. Position the 3/8-inch stop bolt (12) and lock nuts (7) in the lift arm (1) so the head of the stop bolt extends as little as possible. After marker is folded, adjust stop bolt to tighten chain.
8. When mounting marker carrier (27), mount the marker carrier arm (27) to drill frame as noted in the illustration. Use the clamp plates (22), 1/2-by-3 1/2-by-6 1/2-inch u-bolts (23), lock washers (25), and hex nuts (24). The carrier arm (27) should be set 24 1/8 inches above the drill frame.

NOTE: On 24-foot drills with dual gauge wheels, mount carrier on top tube only. Discard one clamp plate and its mounting hardware. Set carrier arm (27) 32 5/8 inches above drill frame.

NOTE: On bean machines, use 1/2-by-7 1/32-by-8-inch u-bolts to mount larger clamp plates on top frame tube.



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Figure 1  
Marker Assembly

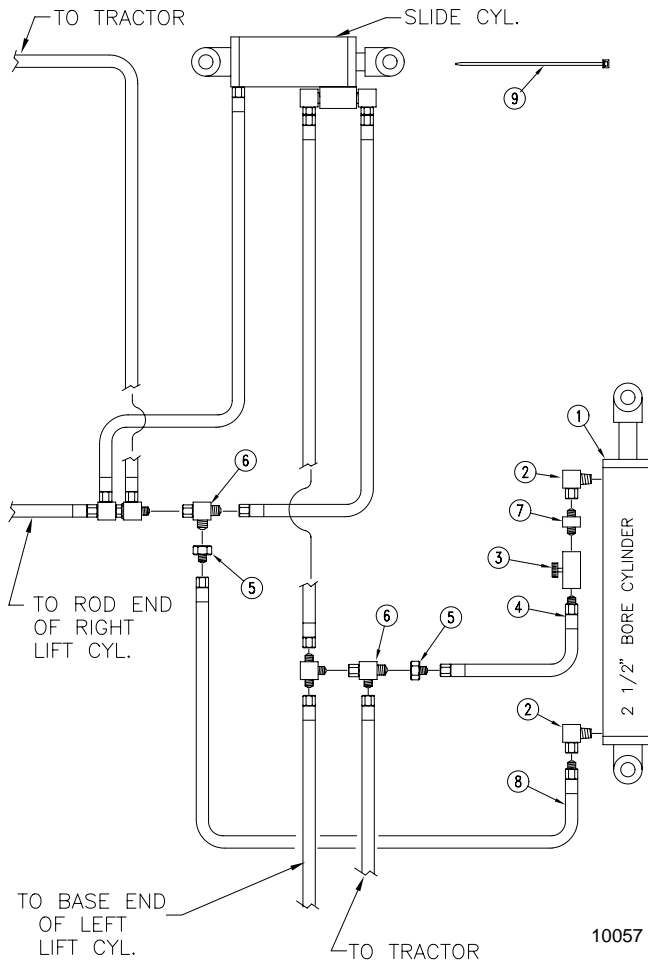
## Assembly

- Mount the support arm saddle (34) to the support arm (27) with 1/2-by-2-by-3-inch u-bolts (30), lock washers (28) and hex nuts (29). The support saddle should be centered under the marker chain and the square tube of the second section (2) when folded to prevent wear. The support arm should support the second section so it is parallel with the seed-box lid. Adjustment can be made by loosening the u-bolts that clamp the marker carrier and slide marker carrier up or down to parallel marker with drill box lid.
- Fold the marker to transport position. With the marker chain (15) in the slot of the support arm saddle (34), take up the slack in the marker chain by threading 3/8-by-2 1/2-inch hex bolt (12) out against the chain bar weldment (13), lock this stop bolt in position with the two hex nuts (7).

### Hydraulic Assembly, Single Marker

Refer to Figure 2.

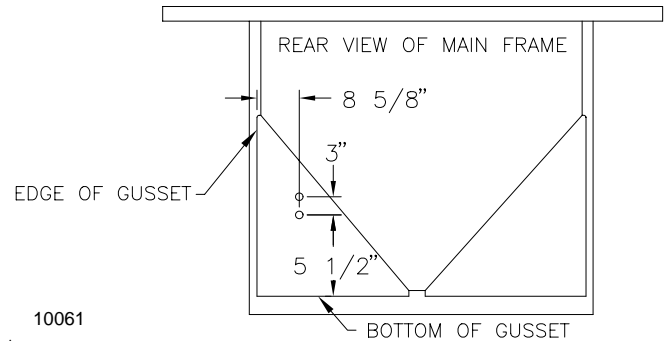
- Attach fittings (2 and 7) to cylinder ports. Attach the needle valve (3) and hoses to the cylinder fittings. Route hoses down to the drill frame and along the back side of the drill frame tubes to the center of the drill. Route hoses to the service tees (6) for the slide cylinder. Install service tee (6) at tractor hose connection and at the slide cylinder connection as shown. Route hoses and secure with plastic tie straps to prevent kinking and pinching during folding operations.
- Bleed the air out of the hydraulic system. Refer to *Bleeding Marker Hydraulics*, page 5.
- Adjust the speed of the marker with the needle valve to a slow setting. Fold the marker up and down a few times and recheck for pinching and kinking of hoses. Reset folding speed with the needle valve to a safe speed.



**Figure 2**  
Single Marker Hydraulics

### Hydraulic Assembly, Dual Markers

- Drill two 13/32-inch holes in left-hand, main frame gusset at location shown in Figure 3.



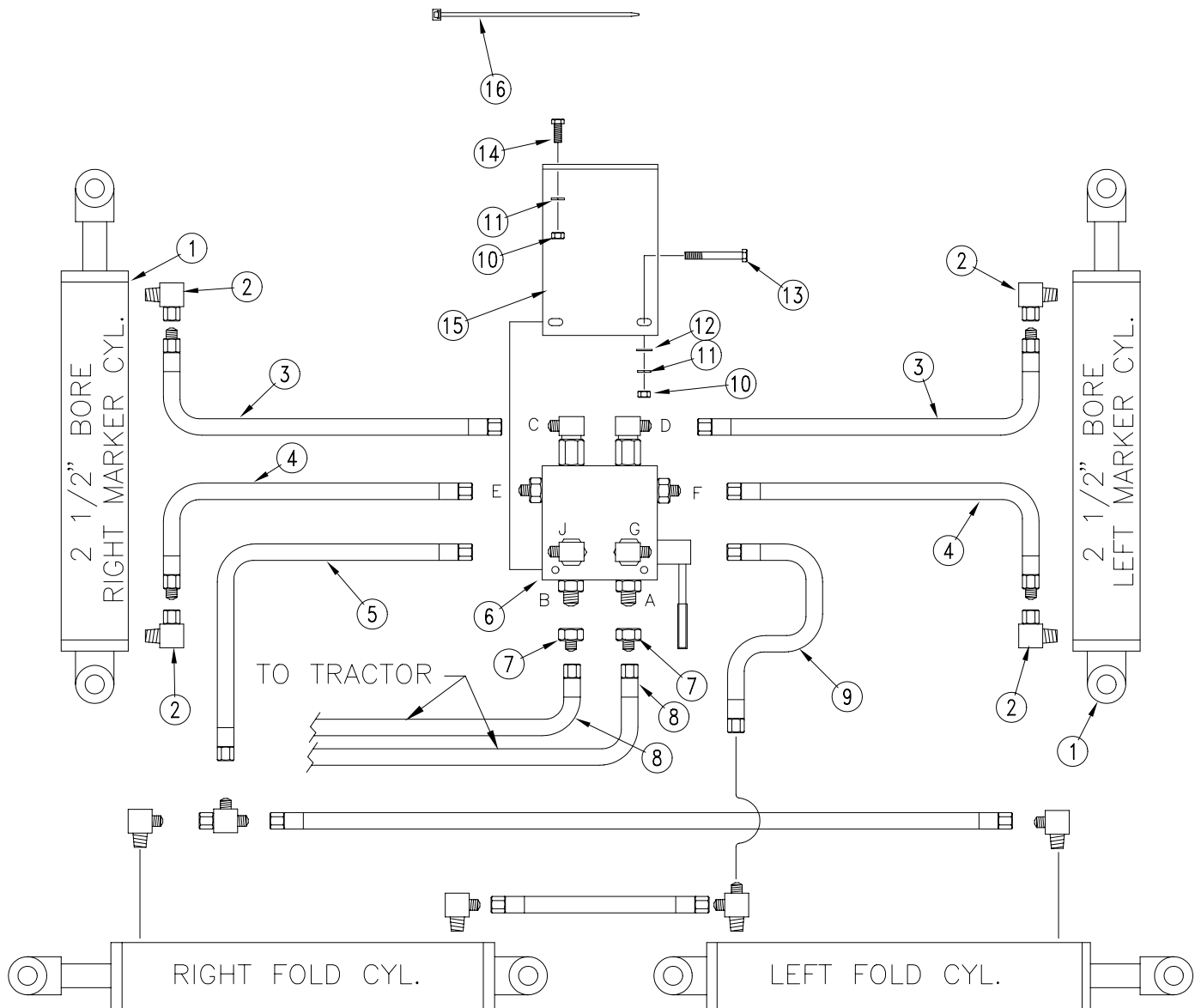
**Figure 3**  
Drill Holes in Gusset

## Assembly

Refer to Figure 1.

- Attach the selector valve mount (15) to the main frame using 3/8-by-1-inch bolts (14), lock washers (11), and hex nuts (10).
- Attach the selector/sequence valve (6) to the selector valve mount (15) using 3/8-inch bolts (13), flat washers (12), lock washers (11), and hex nuts (10).
- Route hoses from the selector/sequence valve down the transport frame tube. Check hose routing for pinching and kinking of hoses and securely attach with plastic cable ties (16).
- Attach hoses to cylinder ports. Be certain to check for correct port location back to the selector valve.
- Detach existing tractor hoses (8) from wing cylinders. Attach 17-inch hose (9), and 42-inch hose (5), and tractor hoses (8), to selector/sequence valve (6) and wing cylinders. Assemble remaining hoses as indicated.
- Bleed marker hydraulics as explained under *Bleeding Marker Hydraulics*, page 5.
- When ready to fold wing boxes for transporting, divert oil to the fold cylinders by positioning the handle on the selector/sequence valve toward the port marked "G".

NOTE: Folding speed of the dual markers is regulated by an internal orifice in the sequence valve which is sized for proper operation of the valve spool. Do not try to adjust or alter this orifice size. This will cause failure of the sequence valve.



**Figure 1**  
**Dual Marker Hydraulics**

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## Bleeding Marker Hydraulics

1. Be sure tractor hydraulic reservoir is full.
2. With the marker(s) unfolded, crack the hydraulic hose fitting(s) at the base end of the cylinder(s). With your tractor at an idle speed, activate your tractor hydraulic valve until hydraulic oil seeps out around the hose ends. Tighten the hose-end fittings and repeat this process with the hose-end fitting(s) at the rod end of the cylinder(s). If dual markers are used with a selector/sequence valve, follow the procedure above for one marker cylinder. Then crack the fittings on the back side of the selector/sequence valve, activate the tractor hydraulics valve until hydraulic oil seeps out around the hose ends. Tighten the hose-end fittings and repeat the complete process for the opposite marker cylinder.
3. Fold and unfold the marker(s) slowly to work all the air out of the hydraulics. Use caution when folding and unfolding the marker for the first time, and check for pinching and kinking of hoses.

NOTE: JIC fittings do not require high torque. JIC and O-ring fittings do not require sealant. Always use liquid pipe sealant when adding or replacing pipe-thread fittings. To avoid possible danger of cracking hydraulic fittings from over tightening, do not use plastic sealant tape.

## Listing of Parts

### 113-196A 30-Foot, 2-Section Single Marker

Your Kit Includes:

Qty.	Part No.	Part Description
1	113-232K	30FT LH. F.F. MKR. BUNDLE
1	113-238K	30FT 2 SEC L.H. F.F. MKR HD
1	113-329M	MANUAL 24-30 2-SEC FF MKR
1	113-612V	30' 2SEC LH MARKER HOSE BUN

### 113-197A 30-Foot, 2-Section Dual Marker

Your Kit Includes:

Qty.	Part No.	Part Description
1	113-234K	30FT DUAL.F. MKR. BUNDLE
1	113-239K	30FT 2-SEC DUAL F.F. MKR HD
1	113-329M	MANUAL 24-30 2-SEC FF MKR
1	113-613V	30' 2SEC DUAL MARKER HOSE B

### 113-200A 24-Foot, 2-Section Single Marker

Your Kit Includes:

Qty.	Part No.	Part Description
1	113-242K	24FT L.H.F. MKR. UNDL
1	113-243K	24FT L.H. F.F MKR HDW
1	113-329M	MANUAL 24-30 2-SEC FF MKR
1	113-616V	24' 2SEC LH MARKER HOSE BUN
1	113-200A	24' 2 SEC SINGLE MARKER
1	113-179H	LH MARKER MOUNT
3	800-001C	GREASE ZERK STRAIGHT 1/4-28

### 113-201A 24-Foot, 2-Section Dual Marker

Your Kit Includes:

Qty.	Part No.	Part Description
1	113-244K	24FT DUAL.F. MKR. UNDL
1	113-245K	24FT DUAL F.F. KR HDW
1	113-329M	MANUAL 24-30 2-SEC FF MKR
1	113-617V	24' 2SEC DUAL MARKER HOSE B

### 113-283A 30-Foot, Bean Machine Dual Markers

Your Kit Includes:

Qty.	Part No.	Part Description
1	113-234K	30FT DUAL.F. MKR. BUNDLE
1	113-282K	30'BM 2SEC DUAL F.F. MKR HD
1	113-613V	30' 2SEC DUAL MARKER HOSE B
6	800-300C	CABLE TIE 1 DIA MIN - ORG