

ACE Tubing Cutters

MAN-REC-ACE-101 (R00)

OWEN OIL TOOLS

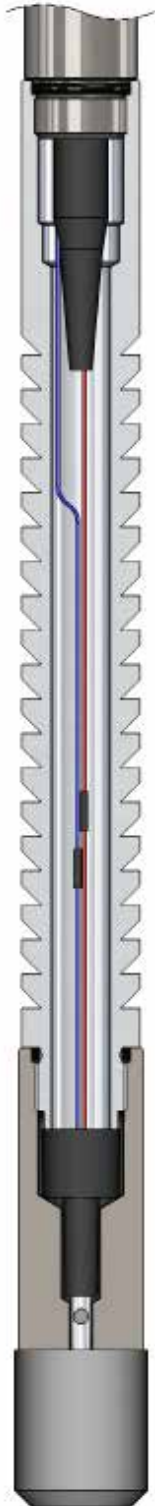
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PRODUCT INFORMATION:



DESCRIPTION:

Tubing Cutters are designed to cut tubing during Pipe Recovery Operations.

OPERATION:

Tubing Cutters provide a quick and effective solution to sever tubing in the removal of pipe. These cutters utilize manufacturing and packaging processes to allow easy shipment and fast delivery to the customer.

Tubing Cutters with the largest possible diameter capable of running in the well should be chosen to achieve maximum performance. A gauge run is recommended prior to running the tool to prevent any safety concerns like sticking a live cutter in the well or “spudding” with explosive tools. The Tubing Cutters are designed to be shot in the tubular, but not in the collar. To maintain the maximum allowable performance from the cutter, it should be centralized. A de-centralized cutter may result in a partial cut and/or damage to the casing. It is also recommended that tension be applied to the tubing prior to detonation of the Tubing Cutter to assist in the removal of tubulars.

Owen Oil Tools’ Tubing Cutters utilize explosive technology and are designed to explosively sever tubular members when initiated by an Owen Resistorized Bridge™ Detonator or RF-Safe “Green DET™” Detonator. Owen electrical detonators adhere to API RP-67 specifications. All safety rules and regulations should be strictly followed when storing, handling, assembling, and using these cutters and/or detonators. Safety precautions should be taken in accordance with your company’s safety policies, governmental regulations, and the American Petroleum Institute Recommended Practice 67 (API RP-67).

Owen’s Tubing Cutters come standard with HMX explosive powder rated to 400° F (204° C) for 1 hour.

RECOMMENDED PRACTICES:

A minimum of two bowspring centralizers should be run as a part of the tool string to insure adequate centralization of the cutter at depth. One of the bowspring centralizers should be placed as close to the tubing cutter as possible while the second should be as close to the CCL as possible. Owen recommends the 1 11/16” Bowspring Centralizer, Owen part number AES-AS60066-6.

ADVANTAGES:

- Reduces fishing costs and uncertainty due to reduced flare over conventional jet cutters
- Cutter safety requirements are satisfied with compliance to API RP 67
- Reduces inventory costs by offering one cutter for multiple weights and grades of tubulars
- Air shippable as 1.4D

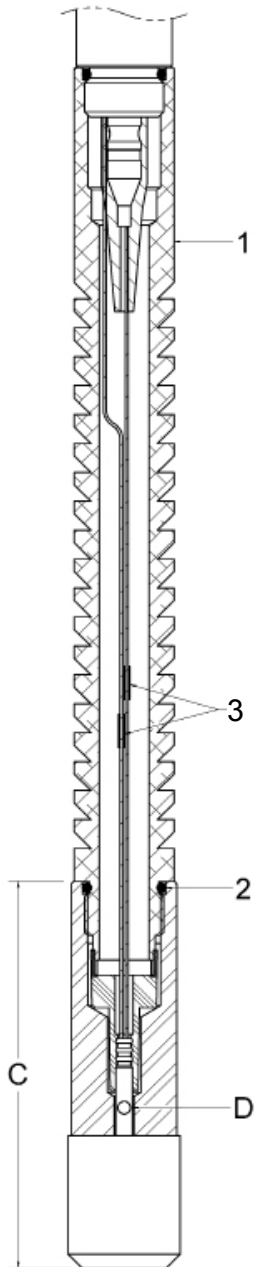
PRODUCT INFORMATION:

SPECIFICATIONS:

OUTER DIA IN (MM)	TEMP. °F (°C)	PRESSURE PSI (MPA)	EXPLOSIVE WEIGHT LB (KG) (G)	RECOMMENDED APPLICATION		PART NUMBER
2.500 (63.5)	400 (204)	15,000 (103.4)	.067 (.031)(30.5)	3.500"	9.3# - 12.95#	CUT-2500-409
2.062 (52.4)	400 (204)	15,000 (103.4)	.040 (.018) (18.3)	2.875"	6.5# - 8.7#	CUT-2062-409
1.687 (42.9)	400 (204)	15,000 (103.4)	.026 (.012) (12)	2.375"	4.7# - 5.95#	CUT-1687-409

BILL OF MATERIALS:

ITEM	DESCRIPTION	2.375"	2.875"	3.500"
1	Aluminum Shock Sub - Open Bore	CUT-0100-079	CUT-0100-079	CUT-0100-079
	Steel Extension Adapter	CUT-0100-087	CUT-0100-087	CUT-0100-087
2	O-Ring for Adapter	000-V569-214	000-V569-214	000-V569-214
3	Splice Boot	PUR-0210-001	PUR-0210-001	PUR-0210-001
C	Tubing Cutter	1.687" / CUT-1687-409	2.062" / CUT-2062-409	2.500" / CUT-2500-409
D	Detonator	DET-3050-009L or DET-3050-409	DET-3050-009L or DET-3050-409	DET-3050-009L or DET-3050-409
-	RP-67 Arming Shield (not shown)	CUT-1687-046	CUT-2062-047	CUT-2500-047
-	Shunt Plug (Not Shown)	CUT-0100-016		
-	1.687" Bowspring Centralizer (Not Shown)	AES-AS60066-6		



Items 1 - 3 and detonator must be ordered separately from cutter assembly. Alternate arming assembly available, using JRC style extension adapter with button contacts, CUT-0100-078 and detonator with spring contacts, DET-3050-009E for 1.56" and larger cutters.

NOTES:

Explosive cutters may create large amounts of debris after firing! Should retrievable devices be set below the planned cutting depth, then it must be noted that these devices may not be retrievable after cutting operations.

WARNING:

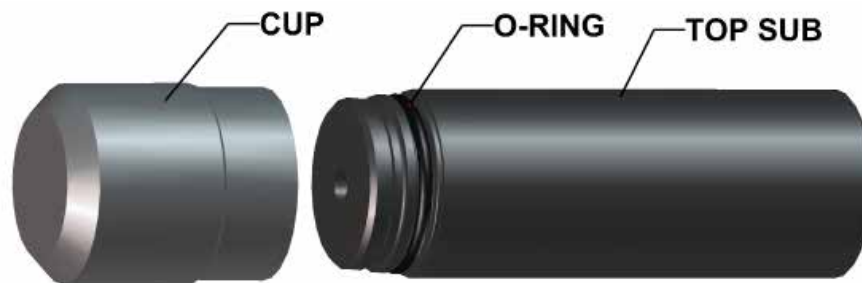
Use of Owen equipment contrary to manufacturer's specifications may result in property damage, serious injury or fatality. If you are not trained in the handling and use of explosive devices, do not attempt to assemble any Owen Perforating Systems or Owen Firing Devices.



Note: Explosive cutters may create large amounts of debris after firing! Should retrievable devices be set below the planned cutting depth, then it must be noted that these devices may not be retrievable after cutting operations.

Recommendation

When running any explosive cutting device, it must be noted that significant debris could be left in the well. This debris may make re-entry into the pipe stub below the cut depth difficult. Retrieval of any temporary set device in the pipe below cutting depth may not be possible until this debris has been removed. Always consult with Owen Oil Tools should you need to clarify any of these recommendations.



1.0 Assembly and Arming of Tubing Cutter Using DET-3050-009L or DET-3050-409



WARNING: Always follow API RP-67 guidelines when arming electrical detonators!

Figure 1: Exploded Assembly View of Tubing Cutter

CUTTER PART #	O-RING
CUT-1687-409	218
CUT-2062-409	223
CUT-2500-409	226



Note: The Tubing Cutter will normally be shipped assembled, but must be disassembled to install the O-Ring and to arm the tool.

- 1.1 Visually inspect the O-Ring for cuts or cracks and lightly lubricate it with grease.
- 1.2 Install the O-Ring onto the Top Sub as shown in Figure 1.



Figure 2: Finger Spring Washer Installation



Note: *The Tubing Cutter Cartridges and Booster are pre-assembled and inside the cutter Cup.*

- 1.3 Thread the cup retaining the explosive cutter load onto the bottom of the Top Sub. Make sure the cup shoulders out on the Top Sub and the O-Ring seal is sufficiently formed. Make sure the finger spring washer is installed as shown in Figure 2. It does not matter if the fingers on the spring are pointing up or down.
- 1.4 Remove the detonator from its package.
- 1.5 Insert the detonator into a safety shield.
- 1.6 Measure the resistance of the detonator between the two lead wires with a blaster's multimeter. Please refer to the User Manual specific to the detonator being used to determine what the resistance value should read.
- 1.7 Remove the O-Ring from package. Inspect it visually for cuts or cracks. Lightly lubricate the O-Ring with grease.
- 1.8 Install the O-Ring onto the Extension Adapter.

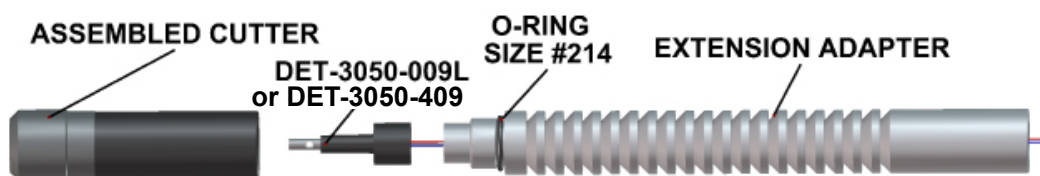


Figure 3: Exploded Arming View of Tubing Cutter

- 1.9 Ensure the wireline is shunted through the shooting panel.
- 1.10 Insert the detonator lead wires through the hole in the Extension Adapter.
- 1.11 Electrically connect the detonator lead wires to the wireline or toolstring.
- 1.12 Mechanically connect the Extension Adapter to the wireline toolstring.
- 1.13 Remove the detonator from the safety shield and install the booted portion of the detonator over the end of the Extension Adapter.
- 1.14 Thread the Top Sub onto the Extension Adapter with the detonator fitting inside the bore of the Top Sub.



- 1.15 The tool is armed and ready to run in hole.

2.0 Assembly and Arming of Tubing Cutter Using DET-3050-009E



Warning: Always follow API RP-67 guidelines when arming electrical detonators.

Figure 4: Exploded Assembly View of Tubing Cutter

CUTTER PART #	O-RING
CUT-1687-409	218
CUT-2062-409	223
CUT-2500-409	226



Note: The Tubing Cutter will normally be shipped assembled, but must be disassembled to install the O-Ring and to arm the tool.

- 2.1 Visually inspect the O-Ring for cuts or cracks and lightly lubricate it with grease. Make sure the Cup that retains the explosive cutter load is removed from the Top Sub.



Note: The Tubing Cutter Cartridges and Booster are pre-assembled and inside the cutter Cup.

2.2 Remove the detonator from its package, disconnect the ground wire from the spring and wrap it around the rubber sleeve of the detonator. The detonator will still be shunted because the temporary shunt has not been removed.



Note: Refer to the 009 Cutter Detonator manual (MAN-DET-009) for more information about the proper use of the detonator.

2.3 Thread the Shunt Plug into the Shock Sub with Contacts



Figure 5: Exploded Arming View of Tubing Cutter Using DET-3050-009E

2.4 Install the detonator onto the bottom nose of the Shock Sub with Contacts so that the detonator's rubber boot fits snug around the nose. Take caution not to roll the rubber boot and disrupt the contact between the detonator and internal contact of the Shock Sub with Contacts.

2.5 With the system shunted by the Shunt Plug, remove the temporary shunt wire from the detonator.

2.6 Install the Arming Sub onto the Top Sub.

2.7 Make sure the #214 O-Ring is lightly lubricated with grease and install the Shock Sub with Contacts with the detonator installed on the nose into the top end of the Top Sub, detonator first.

2.8 Now that the detonator is safely contained within the Arming Sub, remove the Shunt Plug from the top end of the Shock Sub with Contacts.

2.9 Make sure the wireline is shunted and connect the Shock Sub with Contacts to the wireline. This will electrically connect the detonator to the wireline, while the detonator is still in the confined hardware.

2.10 Remove the Arming Sub.

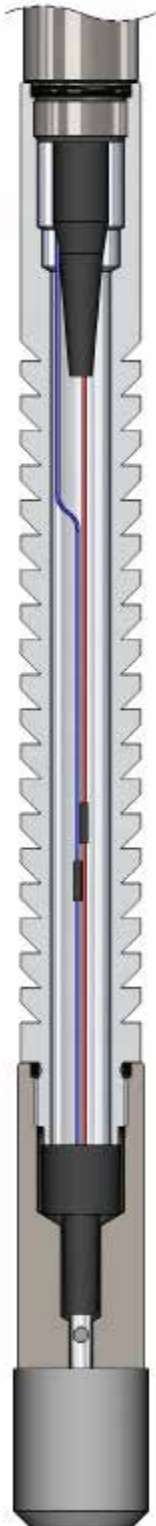
2.11 Reapply a light coating of grease to the O-Ring on the bottom of the Top Sub. Then, thread the cup retaining the explosive cutter load onto the bottom of the Top Sub. Make sure the cup shoulders out on the Top Sub and the O-Ring seal is sufficiently formed. Make sure the finger spring washer is installed as shown in Figure 6. It does not matter if the fingers on the spring are pointing up or down.

2.12 The tool is armed and ready to run in hole.



Figure 6: Finger Spring Washer Installation

PRODUCT INFORMATION:



BENEFITS:

Extended Range Tubing Cutters are designed for use in Pipe Recovery Operations as a final solution. The cutter is undersized to get through tight restrictions where a conventional cutter is not an option.

Extended Range Tubing Cutters provide a quick and effective solutions to sever tubing. Extended Range Tubing Cutters utilize unique manufacturing and packaging processes to allow easy shipment and fast delivery to the customer.

The cutter with the largest possible diameter capable of running in the well should be chosen to achieve maximum performance. A gauge run is recommended prior to running the tool to insure the cutter can get to proper depth. This will prevent any safety concerns like sticking a live cutter in the well or spudding with explosive tools. Extended Range Tubing Cutters are to be shot in the tubing, but not at the collar. To maintain the maximum allowable performance from the cutter, it should be centralized. A de-centralized cutter may result in a partial cut and/or damage to the casing. It is also recommended that tension be applied to the tubing prior to detonation of the Tubing Cutter to assist in the removal of tubulars.

Extended Range Tubing Cutters utilize explosive technology and are designed to explosively sever tubular members when initiated by an Owen's Resistorized Bridge™ Detonator or RF-Safe "Green DET™" Detonator.. Owen's electrical detonators adhere to API RP-67 specifications. All safety rules and regulations should be strictly followed when storing, handling, assembling, and using these cutters and/or detonators. Safety precautions should be taken in accordance with your company's safety policies, governmental regulations, and the American Petroleum Institute Recommended Practice 67 (API RP-67).

Extended Range Tubing Cutters come standard with HMX explosive powder rated to 400° F (204° C) for 1 hour.

ADVANTAGES:

- Reduces fishing costs by utilizing the ACE™ cutting technology to minimize flare.
- Capable of cutting multiple weights and grades, including chrome
- Conforms to API RP-67 arming requirements
- "Air shippable" as Class 1.4D

PRODUCT INFORMATION:

SPECIFICATIONS:

OUTER DIA IN (MM)	TEMP. °F (°C)	PRESSURE PSI (MPA)	EXPLOSIVE WEIGHT LB (KG) (G)	RECOMMENDED APPLICATION	PART NUMBER
1.687 (42.9)	400 (204)	5,000 (34.5)	.04 (.019) (19)	2.875" 6.5# - 8.7#	CUT-1687-429
1.875 (47.6)	400 (204)	15,000 (103.4)	.032 (.015) (15)	2.875" 6.5# - 8.7#	CUT-1875-419
2.188 (55.6)	400 (204)	15,000 (103.4)	.064 (.029) (29)	3.500" 9.3# - 12.95#	CUT-2188-419

BILL OF MATERIALS:

ITEM	DESCRIPTION	2.875"	3.500"
1	Aluminum Shock Sub - Open Bore	CUT-0100-079	CUT-0100-079
	Steel Extension Adapter	CUT-0100-087	CUT-0100-087
2	O-ring for Adapter	OOO-V569-214	OOO-V569-214
3	Splice Boot	PUR-0210-001	PUR-0210-001
C	Tubing Cutter	1.687" / CUT-1687-429	2.188" / CUT-2188-419
		1.875" / CUT-1875-419	
D	Detonator	DET-3050-009L or DET-3050-409	DET-3050-009L or DET-3050-409
-	RP-67 Arming Shield (Not shown)	CUT-1687-046	CUT-2062-047
-	Shunt Plug (Not Shown)	CUT-0100-016	
-	1.687" Bowstring Centrizer (Not Shown)	AES-AS60066-6	

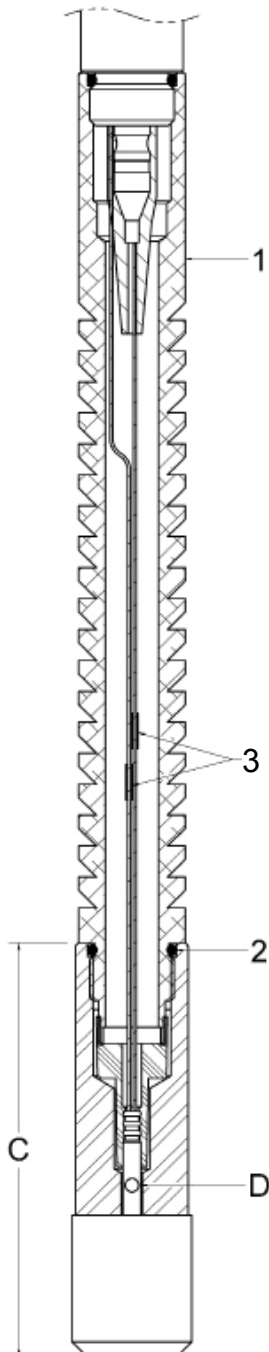
- Items 1 - 3 and detonator must be ordered separately from cutter assembly.
- Alternate arming assembly available, using JRC style extension adapter with button contacts, CUT-0100-078 and detonator with spring contacts, DET-3050-009E for 1.56" and larger cutters.
- ACE™ Extended Range Cutter is not intended to replace standard cutter application.

NOTES:

Explosive cutters may create large amounts of debris after firing! Should retrievable devices be set below the planned cutting depth, then it must be noted that these devices may not be retrievable after cutting operations.

WARNING:

Use of Owen equipment contrary to manufacturer's specifications may result in property damage, serious injury or fatality. If you are not trained in the handling and use of explosive devices, do not attempt to assemble any Owen Perforating Systems or Owen Firing Devices.



3.0 Assembly and Arming of Tubing Cutter Using DET-3050-009LS



Warning: Always follow API RP-67 guidelines when arming electrical detonators!

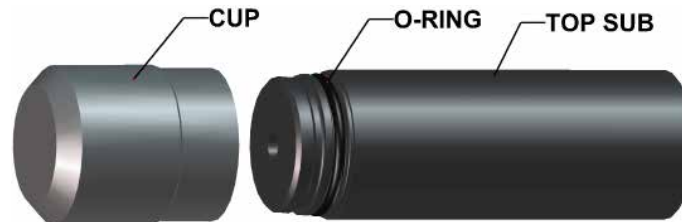


Figure 7: Exploded Assembly View of Tubing Cutter

CUTTER PART #	O-RING
CUT-1437-419FG	213
CUT-1875-419	218
CUT-2188-419	223



Note: The Tubing Cutter will normally be shipped assembled, but must be disassembled to install the O-Ring and to arm the tool.

- 3.1 Visually inspect the O-Ring for cuts or cracks and lightly lubricate it with grease.
- 3.2 Install the O-Ring onto the top Sub as shown in Figure 7.
- 3.3 Thread the cup retaining the explosive cutter load onto the bottom of the Top Sub. Make sure the cup shoulders out on the Top Sub and the O-Ring seal is sufficiently formed. Make sure the finger spring washer is installed as shown in Figure 2. It does not matter if the fingers on the spring are pointing up or down.



Note: The Tubing Cutter Cartridges and Booster are pre-assembled and inside the cutter Cup DO NOT ATTEMPT TO DISASSEMBLE.

- 3.4 Remove the detonator from its package.
- 3.5 Insert the detonator into a safety shield.

- 3.6 Measure the resistance of the detonator between the two lead wires with a Blaster's Multi meter. The detonator should read 51 Ohms \pm 5 Ohms.
- 3.7 Remove the O-Ring from package. Inspect it visually for cuts or cracks. Lightly lubricate the O-Ring with grease.
- 3.8 Install the O-Ring onto the Extension Adapter.

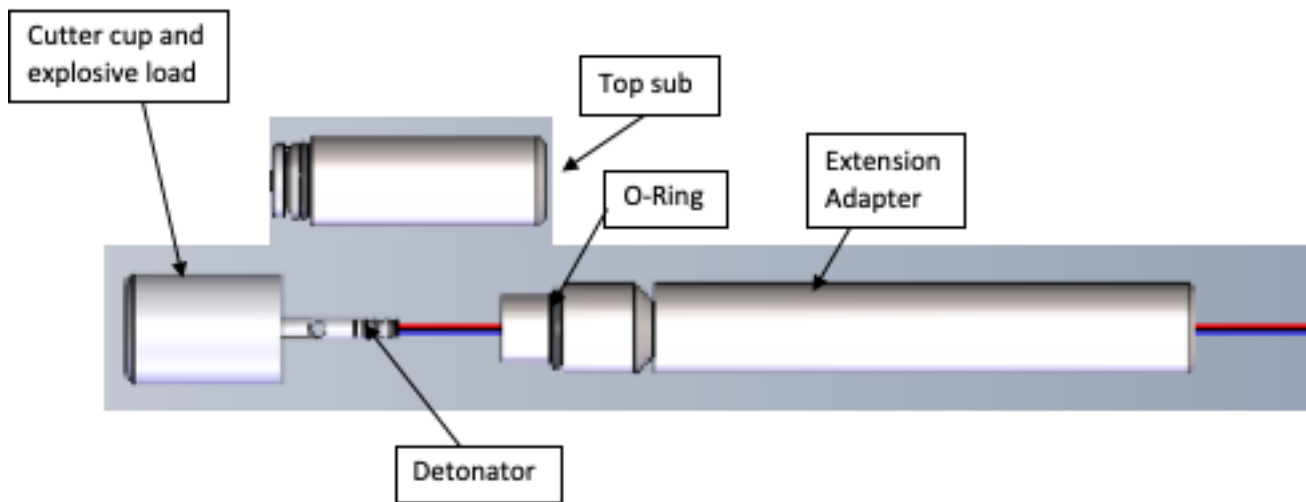


Figure 8: Exploded Arming View of Tubing Cutter Using DET-3050-009LS

- 3.9 Insure the wireline is shunted through shooting panel.
- 3.10 Insert the detonator lead wires through the hole in the Extension Adapter.
- 3.11 Electrically connect the detonator lead wires to the wireline or toolstring.
- 3.12 Mechanically connect the Extension Adapter to the wireline toolstring.
- 3.13 Remove the detonator from the safety shield and install the booted portion of the detonator over the end of the Extension Adapter.
- 3.14 Thread the Top Sub onto the Extension Adapter with the detonator fitting inside the bore of the Top Sub.
- 3.15 The tool is armed and ready to run in hole.

4.0 Frequently Asked Questions

4.1 What grades of tubing can ACE Tubing Cutters cut?

- ACE Tubing Cutters are capable of cutting all material grades ranging from J-55 up to Q-125 as well as 13Cr through 25Cr tubular. The chrome grades should range from 80 grade up to 100 grade.
- ACE Extended Range Tubing Cutters are capable of cutting all material grades ranging from J-55 up to P-110, as well as 13Cr and 22Cr tubulars. The chrome grades range from 80 grade up to 110 grade.