

Shogun LINK System Technical Manual

1.562 - 2.500 inch

MAN-STP2-000 (R03)

OWEN OIL TOOLS

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1.0 Pre-Assembly



Warning: *Explosives are destructive by nature! Do not attempt to disassemble or alter explosive products in any manner! Do not crush, hammer, pinch, impact, pull wires or abuse any explosive product!*



Warning: *Be sure to follow safe operating practices as found in API RP-67 in accordance with governmental regulations, company policies and manufacturer's recommendations!*



Note: *At the Top Sub always skip 4 shots on single guns.*



Note: *Before loading and testing, visually inspect the components for any defects.*



Note: *When assembling this system always use supports until in upright position.*

2.0 Gun Assembly Instructions

- 2.1 Load the desired number of charges. Charges can be loaded into the links and locked into place with a retaining ring.
- 2.2 Connect the Charges together using Connecting Pins. Pliers can be used to bend the pins and lock them in place.
- 2.3 If a one shot per foot gun is desired, use a Spacer. If a blanked-off section is desired, use Spacers and thread the Detonating Cord through the loop formed by the bent Connecting Pins.
- 2.4 Place one Spacer on the top of the gun and attach it to the Shooting Adapter using a Connecting Pin.
- 2.5 Place a Guide Nose on the bottom of the gun.

- 2.6 Cut a piece of Detonating Cord (Using Owen Super Cutters) 25% longer than the gun. Place the Detonating Cord in the groove in the rear of the Charge and bend the wire retainer over the Detonating Cord.
- 2.7 Seal the end of the Detonating Cord at the top of the gun with a Detonating Cord End Seal by inserting the cord fully to the bottom of the seal, then crimping it (using Owen Super Crimpers).



Caution: *Make sure that the Detonating Cord Seal was not cut when the crimp was made!*

- 2.8 Attach a Lead Wire to the Pig-tail from the Contact Sub and seal it with a Rubber Splice Boot. Run the Lead Wire down to the bottom of the gun being sure it is pulled tight so it will not be subjected to wear while the gun is being run into the hole.
- 2.9 Place the detonator into a safety shield and then electrically arm the detonator to the Top Sub by attaching the red lead from the detonator to the hot lead from the Top Sub. Finally, attach the blue lead to the ground on the Guide Nose.
- 2.10 Only after attaching the detonator electrically to the line, attach the detonator to the det cord. Cut the Detonating Cord below the bottom charge (using Owen Super Cutters). Slide a Rubber Sealing Sleeve (PUR-0210-002) over the Detonating Cord and insert the smooth cut end fully into the detonator and crimp (using Owen Super Crimpers). Slide the Rubber Sealing Sleeve down, positioning it over the crimp and tie it with the Siezing Cord. Secure the Detonator tight to the stem of the Guide Nose with Siezing Cord.



Caution: *XHV Detonating Cord should not be used for exposed applications. Users should refer to the Detonating Cord selection chart to select a detonating cord rated for the intended application.*

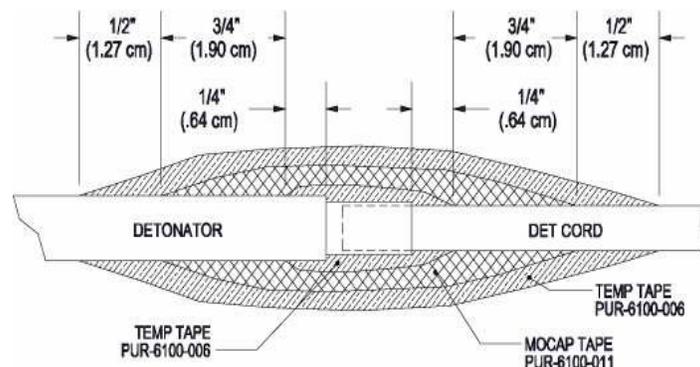
3.0 Exposed Detonator Sealing Instructions

3.1 The connection of the detonator and detonating cord must be sealed as well for an exposed well environment. Owen has developed and proven a best practice for sealing exposed detonator/detonating cord interface. Once the detonating cord has been crimped to the detonator;

- A. While stretching, tightly wrap the 1st layer of Temp Tape (PUR-6100-006) starting 0.250 in. (.64 cm) below the crimp on the Detonator Body and ending 0.250 in. (.64 cm) past the crimp on the det cord. Without cutting the tape, tightly wrap (while stretching) a 2nd layer of tape, following the above process, but in reverse. Now with the tape uncut, stretch and tightly wrap 2 more layers, by following the methods of the first 2 layers.
- B. Starting 0.750 in. (1.9 cm) past one end of the wrapped Temp Tape, begin tightly wrapping (while stretching) the Mocap Tape (PUR-6100-011) over the Temp Tape, until it extends 0.750 in. (1.9 cm) past the Temp Tape. Without cutting the tape, tightly wrap (while stretching) another layer of tape, following the above process, but in reverse.
- C. While stretching, tightly wrap 1 layer of Temp Tape, starting 0.500 in. (1.27) past one end of the Mocap Tape, then over the Mocap Tape until it extends 0.500 in. (1.27 cm) past the end of the Mocap Tape. Now, tightly wrap (while stretching) another layer of tape, following the above process, but in reverse.



Note: *It is essential that when wrapping the tape, that you make sure to overlap the wraps of each layer. This detonator was designed and qualified using the specified tape types and sealing method. All Quality Control (QC) tests are performed using these same procedures.*



Complete the mechanical assembly of the device and tool assembly by attaching the detonator to the toolstring, taking care not to force, pinch, crush, or impact the explosive components or wiring.

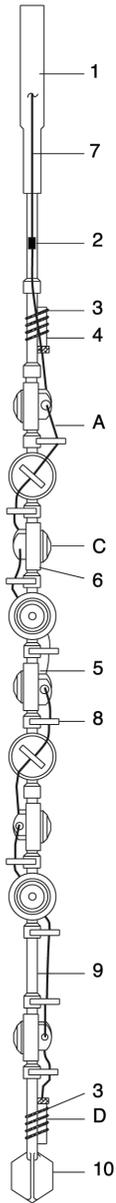
4.0 Running Guidelines

- 4.1 Always run a gauge thru the tubing before running any gun. On this run any correlating logs necessary can be done which saves time on bottom, especially in cases where high temperature and pressure exists.
- 4.2 Slowly insert the gun in the lubricator being careful not to bump the back edge of the charges. This could knock a charge loose and cause it to hang the gun in the tubing. Never try to raise the gun without using the lubricator or rigid support, this could cause a misrun or a fishing job. This system is brittle in the horizontal and will break with the weight of the string if not properly supported.



Caution: *Do NOT lift this system without the proper rigid support. The side load of this system is NOT rated. Without proper support when lifting to the vertical, this system can fail or be pre-stressed to fail when running in hole.*

- 4.3 The gun can be run lower at any reasonable speed except when lowering through some trouble spot or seating nipple, packers etc....
- 4.4 When collars have been checked and the gun is in zone. The firing power is gradually raised to max of one amp or the gun fires.



BILL OF MATERIALS:

ITEM	PART NO.	DESCRIPTION
1	LNK-1437-001	Top Sub
2	PUR-0210-001 PUR-6100-001	Lead Wire Splice Boot, Splice Tape, Teflon
3	PUR-6000-005	Seizing Cord, Nylon
4	DET-0010-001	Detonator Cord End Seal
5	PUR-5000-125 PUR-5000-150	Retaining Ring - 1-11/16" Holder (1 each per charge holder) Retaining Ring - 2-1/8" Holder (1 each per charge holder)
6	--	Charge Holder Shogun Link (See Ref. Chart)
7	PUR-6122-001 PUR-0600-003	Lead Wire, Teflon Lead Wire, Nylon
8	PUR-0506-052B	Connecting Pin, 1/8" O.D.
9	LNK-0001-002 LNK-0001-003	Spacer, 3" Long for 90° phasing Spacer, 3" Long for 0° and 180° phasing
10	LNK-1687-005 LNK-2125-005	Guide Nose, 1-11/16" O.D. Guide Nose, 2-1/8" O.D.
A	A580010 A571010	Detonating Cord, 80 gr., RDX Detonating Cord, 80 gr., HMX
C	STP-1687-301E STP-1687-401NB STP-1687-401NT STP-1687-401NTX STP-2125-301E STP-2125-301BE STP-2125-401NB STP-2125-401NT STP-2125-401NTX	1-11/16" Shogun II, DP Charge, RDX 1-11/16" Shogun NT- BH Charge, HMX 1-11/16" Shogun NT, SDP Charge, HMX 1-11/16" Shogun NTX, SDP Charge, HMX 2-1/8" Shogun II, DP Charge, RDX 2-1/8" Shogun BH Charge, RDX 2-1/8" Shogun NT- BH Charge, HMX 2-1/8" Shogun NT, SDP Charge, HMX 2-1/8" Shogun NTX, SDP Charge, HMX
D	--	Resistorized Detonator (See Det. Ref. Sec.)

PART NO.	CHARGE DESCRIPTION	PRESSURE RATING
STP-1687-401NTX	Charge, 1-11/16" HMX, Shogun NT, DP	20,000 psi (138 Mpa)
STP-1687-401NT	Charge, 1-11/16" HMX, Shogun NT, DP	
STP-1687-401NB	Charge, 1-11/16" HMX, Shogun NT, BH	
STP-1687-301E	Charge, 1-11/16" RDX, Shogun II DP	15,000 psi (103 Mpa)
STP-2125-401NTX	Charge, 2-1/8" HMX, Shogun NTX, DP	20,000 psi (138 Mpa)
STP-2125-401NT	Charge, 2-1/8" HMX, Shogun NT, DP	
STP-2125-401NB	Charge, 2-1/8" HMX, Shogun NT, BH	
STP-2125-301E	Charge, 2-1/8" RDX, Shogun II DP	15,000 psi (103 Mpa)
STP-2125-301BE	Charge, 2-1/8" RDX, Shogun II BH	

SPECIFICATIONS:

TEMPERATURE	177 C	350 F
TENSILE STRENGTH	44 daN	100 lbf
GUN WEIGHT LOADED (1-11/16)	2.79 kg/m	1.87 lb/ft
GUN WEIGHT LOADED (2-1/8)	3.09 kg/m	2.07 lb/ft

CHARGE HOLDER SELECTION CHART

1-11/16"	PHASED				
	30°	45°	60°	90°	0°-180°
4 spf	LNK-1687-140	LNK-1687-142	LNK-1687-144	LNK-1687-138	LNK-1687-145
6 spf	LNK-1687-139	LNK-1687-141	LNK-1687-143	LNK-1687-137	LNK-1687-146
2-1/8"	30° Phased	45° Phased	60° Phased	90° Phased	0°-180° Phased
4 spf	LNK-2125-140	LNK-2125-142	LNK-2125-144	LNK-2125-138	LNK-2125-146
5 spf	LNK-2125-139	LNK-2125-141	LNK-2125-143	LNK-2125-137	LNK-2125-145

Note: When assembling this system always use supports until in upright position.