



# SwingJet II™ Technical Manual

## MAN-SWG2-000 (R04)

### Owen Oil Tools

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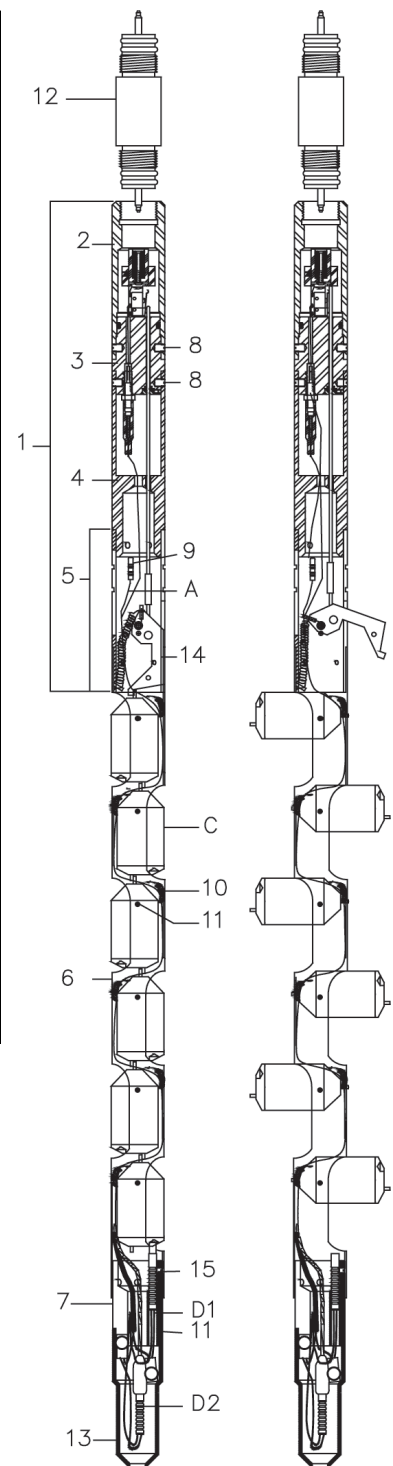
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## 1-11/16" Bom and Schematics

Item	Part No.	Description
1	SWG-1687-200	Firing Connection Assy, 1-11/16" Swing Jet II
2*	SWG-1687-001	Top Sub Adapter (1-3/16" - 12 thd), 1-11/16 - Swing Jet II
3*	SWG-1687-030	Firing Head Assembly, 1-11/16" - Swing Jet II
4*	SWG-1687-016	Connector Housing, 1-11/16 - Swing Jet II
5	SWG-1687-029	Trigger Housing Assembly
6	SWG-1687-140	Carrier, 10 foot, 4.4 spf, 1-11/16" x 3-7/8"
	SWG-1687-136	Carrier, 6 foot, 4.4 spf, 1-11/16" x 3-7/8"
	SWG-1687-134	Carrier, 4 foot, 4.4 spf, 1-11/16" x 3-7/8"
7	SWG-1687-090	Release Housing 1-11/16"
8	PUR-0504-024	1/4"x20 Socket Head Set Screws (1/4" long)
9	DET-0100-072	Rubber End Seal - for 50 or 60 grain Det Cord
10	SWG-1687-120	Charge Deployment Spring, 2 per charge
11	PUR-0504-020	#10x32 Socket Head Set Screws (5/16" long) (100 / box)
12	AES-AS50031	Double Male Adapter, 1-3/16" - 12 UN Threads, Sealing Type
13	SWG-1687-091	Bull Nose, 1-11/16" Swing Jet
14	PUR-0504-020	#10-32 Socket Head Set Screws (5/16" lng.) (100 / box)
15	PUR-0504-017	#10-32 Socket Head Set Screws (1/8" lng.)
A	A574017	Det Cord 60 Grain Round, HMX
	DET-0412-021	Det Cord 50 Grain Round Lead, HMX
--	DET-0100-018	Det Cord Adapter - 40/60 gr Round to 80 gr. Round
C	STK-4250-402SU	Un-capped Charge 1-11/16 x3-7/8" Swing Jet II, HMX
	STK-4250-402NTX	PERF - 1-11/16" X 3-7/8" Raptor NTX
D1	DET-3050-115S	E-86 SWG Release SJ II
D2	--	Resistorized Detonator (Ref. Detonator Sec.)
E	PUR-6122-012	Shielded Lead Wire Cable, 22 Ga. Red and Blue, twisted (1000' roll)
F	PUR-0210-001	Splice Boots (for wire) (100 qty)
G	PUR-0600-017	Connector, 317 Scotchlock UY
H	PUR-6000-005	Seizing Cord
I	SWG-0000-004	Ground Wire
J	PUR-6100-011	Mocap Rubber Tape
K	PUR-6100-001	Teflon Tape
--	SWG-1687-075	Redress Kit 1-11/16 in. SJ II F.H.
--	SWG-1687-077	Redress Kit 1-11/16 in. SJ FH - Kemlon
L	MAN-SWG2-000	Assembly Instructions Swing Jet II



Charge P/N	Charge Type	Weight (g)	Gun Size	Casing Size	PERFORMANCE	
					Hole (in)	Penetration Concrete (in)
STK-4250-402NTX	DP	15	1-11/16" X 3-7/8"	4-1/2"	0.30	30.73

O.D. Before Deployment	1-11/16"
O.D. After Deployment	3-7/8"
Pressure Rating	15,000 psi
Temperature Rating	375°F



## 1.0 Pre-Assembly



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



**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:** *Check all items against the parts list to ensure the components and quantities are correct.*



**Note:** *Visually inspect the Carrier and components for any defects. Check all remaining components for damage or problems which may impede the assembly and function of the gun system.*



**Note:** *The following precautions and inspection steps are necessary to ensure the gun system operates properly.*

## 1.0 Loading

1. Do not puncture the detonating cord. If the det cord is torn or punctured, at any time, replace the det cord with new det cord. Check for any sharp edges the det cord may contact.
2. Check the firing head circuit prior to each assembly.
3. Trigger must swing all the way out of the Trigger housing, even when released slowly.
4. As the gun is being loaded, check each charge for free pivotal movement to the full open position with no amount of drag.
5. Remove the locking pins on the bottom of the last charge so that they cannot interfere with the release squib.
6. If the well is above 310°F (154°C) in temperature , use the lead shielded det cord.

7. Before running the gun in the well, check that all of the pivot screws just slightly protrude through the outside of the carrier.
8. Do not over tighten the screw that holds the Release Squib in place.

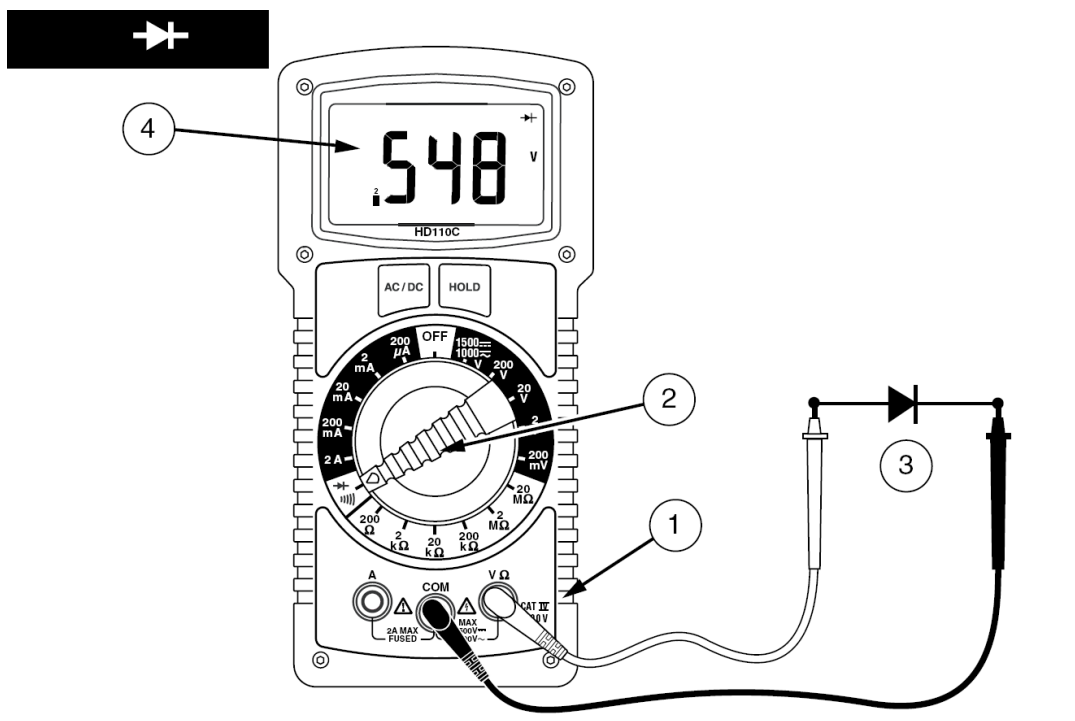
## 2.0 Assembly

### 2.1 Assembly of the Firing Head and Bench Test.

The Firing Head Assembly consists of the Top Sub Adapter, Firing Head, Switch Housing and Trigger Housing Assembly.

The following steps may be used to check the electrical circuit in the Firing Head. The Switch, SWG-1687-002, comes per-wired, see Figure A for wiring diagram. If checking an assembled Firing Head refer to Figures C and D.

A digital Blaster's Multimeter is recommended to check the diodes. The meter (1) shown below is set to measure continuity. This test measures the voltage drop across a diode junction. The dial (2) is set to measure continuity of the example diode (3). The display screen (4) shows a typical value for this type of test.



A. Set the digital Blaster's Multimeter to measure continuity (diode test). Connect the negative lead to the Contact (SWG-1687-028) in the top of the Firing Head. Connect the positive lead to the blue wire that runs to the squib. The meter will read "0.5-.0.6 volts" (if the diode is within specification and the circuit is properly assembled). Reverse the leads, the meter will read "1." (no continuity).

B. With the digital Blaster's Multimeter set the measure continuity (diode test). Connect the positive lead to the Contact (SWG-1687-028) in the top of the Firing Head. Connect the negative lead to the Positive Connector (red wire to the detonator), the meter will read "1." (no continuity). Depress the switch by sliding the rod into the head, the resistance will read "0.5 - 0.6 volts" (if the diode is within specification and the circuit is properly assembled). Reverse the leads and depress the switch by moving the rod and, the meter will read "1." (no continuity).



**Note:** Always replace the switch after each run.

## 2.2 Rebuilding the Firing Head Assembly

It is good practice to send the used Firing Heads back to Owen to be rebuilt. However, if the Firing Head is being rebuilt the following steps must be followed:

A. Replace the switch.

B. Replace the O-ring (OOO-V568-006), by loosening the #6-32 Set Screw, removing the retainer and old O-ring. Replace O-ring, Retainer, and Set Screw. Lightly lubricate O-ring deal and grease Rod before insertion.



**Caution:** If O-ring and Rod are not greased a mis-run may occur!

C. Attach two bare ground wires to the two grounding screws on the Firing Head.

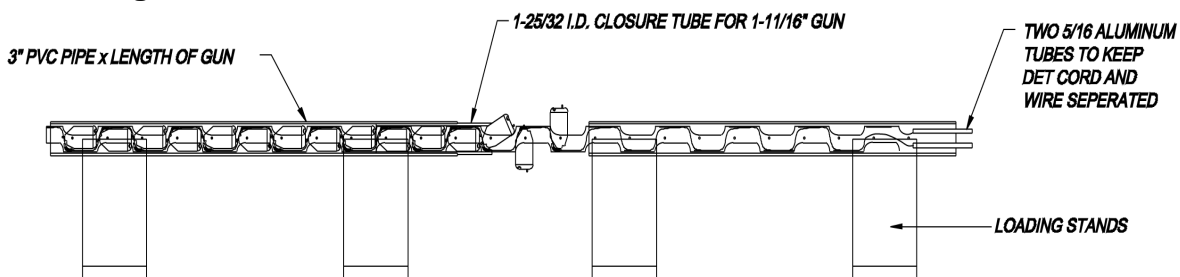
D. Replace Red and Blue wires (after firing, the connectors on the wires become loose and do not make positive contact).

E. Insert the Switch Rod through the Switch Housing and Firing Head (grease rod first), then attach the Trigger housing to the connector with four 1/4-20 Set Screws. The Switch Rod has been pre-assembled to approximately the correct

length, but it is very important that the switch rod be correctly adjusted. See Figure A for the correct setting, for example, with the Trigger in the folded position, the rod should be positioned over the red part of the switch. When the rod touches the stop, the Trigger will be in about the 70° position .

F. When the Firing Head is rebuilt it must be checked per step 2.1.

## 2.3 Loading the Carrier



A. Arrange the four support stands so that both PVC tubes are well supported allowing approximately 24 in (61 cm) between the tubes. Place the closure tube in the left hand tube. Slide the gun carrier in the right hand tube (top first) until approx. 6 in (15 cm) of carrier extends out of the tube. Measure the det cord to fit the length of gun being assembled. (12 in plus 4 in (30 cm plus 10 cm) for each charge being loaded. Although the det cord may be cut to length before loading, it is common practice to leave the det cord on the spool until the entire gun assembly has been loaded.

B. Push the det cord into one of the aluminum tubes until it just comes out the end. Cut length of lead wire allowing approximately 12 in (30 cm) extra over the length of the gun. Place the wire in the other aluminum tubes. These tubes can be taped together for easier placement in the carrier. Slide the det cord and wire tubes in the carrier from the bottom end until it comes out the top end of the carrier. Pull approximately 8-10 in (20-25 cm) of wire and det cord out of the tubes. Place the det cord and wire through the closure tube and slide carrier into the closure tube leaving the top shot position exposed.

C. Rotate carrier so that the top shot opening faces up. Holding exposed det cord and wire slide the 5/16 in aluminum tubes down, exposing det cord and wire over 6 charge positions. Position the first charge in the opening with the pens on the lower end of the charge down. The two pins in the top end of the charge must straddle the det cord and web of the gun. Insert the #10-32 Set Screw through the

carrier and into the charge holes provided. The charge should be pointing down and the two top pins should be exposed. Place the spring onto each pin with the loop against the charge. The springs should fit into the slots of the carrier.

D. Bend the spring tabs of the carrier down and using the spring loading pliers grasp the spring from below. Stretch the spring and hook the loop onto the tab. Sometimes the spring tabs may be burned off, in which case the spring hook can be deformed to hook on the edge of the carrier. With both springs attached fold the charge into the opening and release ensuring that the charge moves freely.

 **Caution:** *It is easy to puncture the det cord when folding in the first and/or second charge!*

E. Ensure that the det cord is between the pins and springs. Now take second charge and install in the same manner. Always ensure that the det cord is between the pins and the wire is below the studs. Load the second charge.

F. Now compress the top charge and slide the closure tube down. Repeat the charge installation procedure until all charges are loaded. Always be sure that each charge swings freely to the fully opened position as each charge is loaded. As the charges are being compressed into the gun housing, the det cord will weave over the charges. During loading ensure that the det cord is not punctured or cut by the pins. Do not attempt to pull the det cord against the charges once the charges are compressed. This could cause damage to the det cord and result in a mis-run. Continue the loading procedure until all the charges are installed. Remove cap pins on bottom charge. This drastically reduces the chance of the bottom charge hanging on the release detonator or carrier.

G. Check for continuity and insulation of both red and blue lead wires with an Ohmmeter.

## 2.4 Attachment of the Release Housing

A. Remove the pins from the last charge, as they are not needed and, when removed, assures the bottom charge will not be held down.

B. Slide the Release Housing in place and attach with set screws. Insert a 3/16 in. brass rod through the Release Housing and into the hole in the bottom of the charge. This holds all charges in the locked position for transportation in the PVC pipe. With all charges in the closed position, cut the det cord 6 in from the end of

the Release Housing and attach the Bull Nose to protect the det cod and wires if the gun is to be transported before further assembly.

## 2.5 Attaching the Trigger and Firing Head Assembly to the Gun

A. Thread the 8 in (20 cm) of detonating cord between the arms of the Trigger shaft. Thread the lead wires to one side of the Trigger and beneath the Trigger shaft. This assures that neither the detonator cord nor the lead wires can foul the Trigger or allow the wires to be cut when the gun is opened. Be sure to pull out any slack in the det cord or wire while the Gun Assembly and Firing Head assembly are joined together.

B. Check to be sure the Trigger moves freely from the closed position to the 70° full open position. Insert the Trigger assembly into the carrier, with the Trigger depressed. Ensure that the Trigger goes under the top pins on the top charge. Insert the four #10-32 x 5/16 in set screws\*. Cut the detonator cord as shown in Figure C, so that the detonator cord is no longer than the slot in the cast iron Trigger Housing.

C. Seal the detonating cord by installing the rubber End Seal and seizing the rubber End Seal 3/16 in. from the det cord with the seizing cord, using a clove hitch. Check that the blue and red wires are not shorted or cut. When using the lead ribbon cord, use the Lead Cord End Seal part number DET-0100-058.

D. Attach the lead wires to the blue lead wire from the gun to the blue (-) wire from the Firing Head and the red lead wire from the gun to the red (+) lead wire from the Firing Head using a UY connector PUR-0600-017 (do not use the UY connector above 275°F (135°C)). Crimp the connector with Connector Crimping Tool PUR-0600-018. Connect the ground wires from the Firing Head to the shielding over the lead wires. Tuck the wires and det cord in the housing and tie seizing cord in the grooves. For temperatures above 275°F (135°C), use splice boots for sealing the joints instead of the UY connector.




**Caution:** *Keep wires and connectors clear of the Trigger!*


## 2.6 At the Wellsite: Attaching the Gun to the Cablehead (refer to Figure “C”)

A. Observe all of your company safety rules before beginning, such as, never attach a live gun to the cable head. Be sure all Cable Head and insulation continuity checks are conducted and satisfactory. Be sure all check fire and Casing Collar Locator checks have been completed and firing circuits are in the “safe” position. After the gun is attached to the tool string, the detonator may be attached. It is recommended that the Owen Sealed Pressure Sub be used rather than the standard Double Male Adapter sub. The sealed pressure sub protects the Casing Collar Locator in the event that the SwingJet II™ Subs leak after the gun has been fired.


## 2.7 At the Wellsite: Attaching the Release Squib

A. Slide the gun out of the PVC pipe and slide the Closure Sleeve over the end of the gun. Remove the brass rod holding the last charge in place. Attach one red lead wire from the E-86 SWG Squib to the blue lead wire and the other blue lead wire to ground with the squib inside a detonator safety shield. Insert the E-86 SWG Release Squib through the Release Housing. Sometimes it is easier to insert the Release Squib into the Charge if the Release Housing is not fully in the up position. Insert the brass plug of the squib into the locking hole in the bottom of the charge.

 **Caution:** *The squib should move freely through the Release Housing hole!*

 **Note:** *Be sure to remove the locking pins from the bottom of the last charge.*

B. Screw in the Set Screw that pushes down the squib.

 **Caution:** *Tighten the #10-32 Set Screw very lightly, only enough to make the bottom charge move very slightly! If the Set Screw is over-tightened, it could dog the Squib, preventing it from releasing the bottom charge and causing a mis-run!*

## 2.8 At the Wellsite: Attaching the Detonator

With the Closure Sleeve still in place, make one last check of the red lead wire to be sure it has continuity (it should be shorted). With the detonator in the detonator safety shield, attach the RED lead wire from the detonator to the red lead wire from the gun. Attach the BLUE detonator lead wire to the lead wire shielding. Remove the detonator from the safety shield.

- **For 50 or 60 grain Det. Cord** - Wrap a 3-1/2 in length of 1/2 in wide Teflon© tape or det cord adaptor, DET-0100-018, on the end of the detonating cord and crimp on the detonator (preferably with Owen Super Crimpers) along the 1/2 in crimp area.
- **Sealing instructions** - refer to detonator manual (these recommendations are included with all exposed detonators manufactured by Owen). This method seals at 475°F (246°C) and 25,000psi).
- **For 40 Lead Ribbon Det. Cord** - Insert the det cord and det cord adapter (DET-0100-018) into the Unidet detonator and crimp in place, tape as per the recommendations that are included with all exposed detonators manufactured by Owen.
- **BHT greater than 310°F (154°C)** - use lead cord. You can use 80 grain cord (of any type) anytime you prefer, but it will cause the gun to swell slightly so that it may not pass thru a small nipple. Anytime you use lead cord you must allow for some shrinkage. To do this, be sure to push down on the lead cord just before you push the charge down.



**Caution:** *The Closure Sleeve should remain in place over the end of the gun while the detonator is being attached so that even if someone should accidentally apply power to the line, the detonator would not be connected to the circuit until the gun is opened, and the Closure Sleeve will prevent the gun from being opened!*


## 3.0 Deployment of the Gun System



**Note:** *This gun system must be run in clean fluid.*



**Note:** *The cable head / logging cable continuity and insulation checks MUST be performed prior to the run to ensure the wireline string is in optimal condition to complete the perforating.*

 **Note:** *When the following recommendations are followed during SwingJet II™ assembly and usage, the possibility of misruns is greatly reduced.*

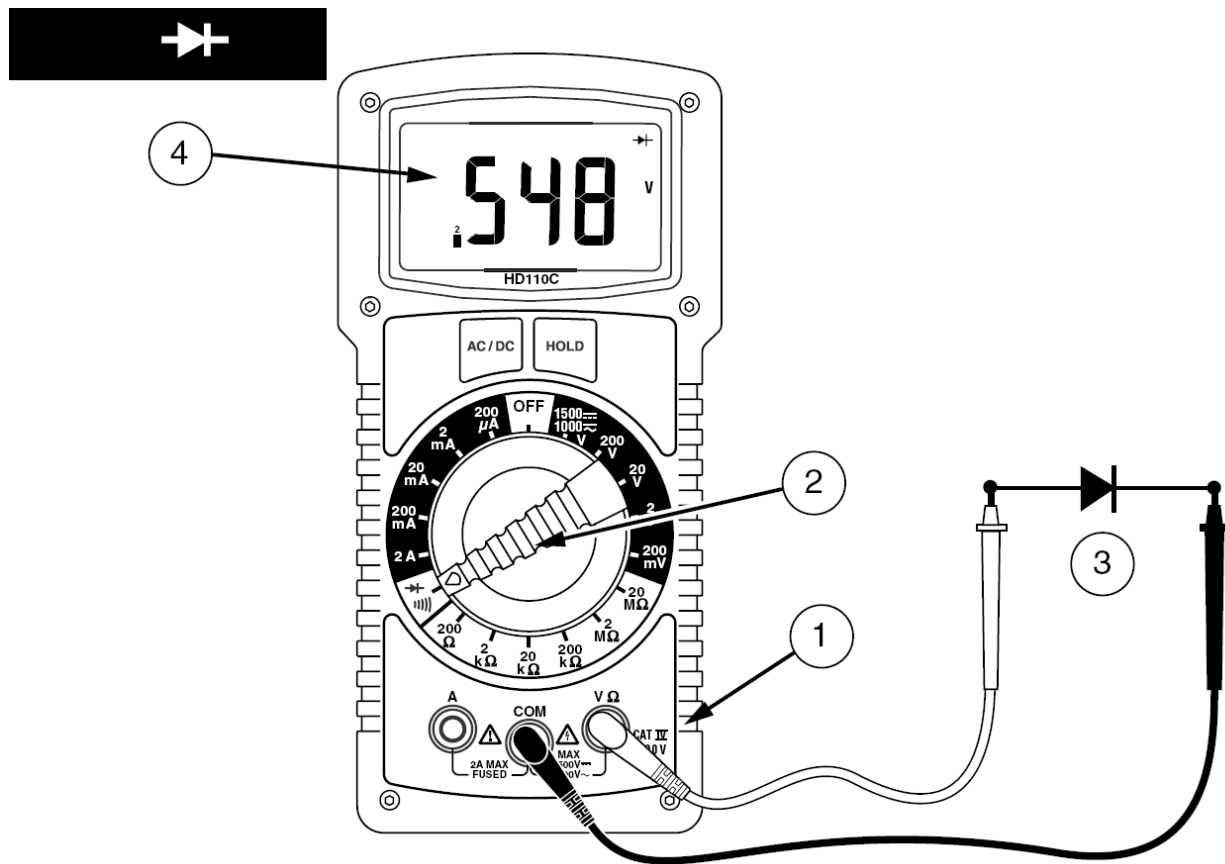
1. Always make a gauge run first before running the SwingJet II™ assembly in the well. If a customer insists on running the gun without making the gauge run first - that customer must buy the gun if there is a misrun because of an obstruction.
2. Use good judgement when running in hole - a maximum speed of 50 ft. per minute is recommended. Care must be taken when running through seating nipples, side pocket mandrels, packers, etc to avoid damaging the gun system.
3. Do not run down into a zone previously perforated with the SwingJet II™. Do not tag bottom. This will cause the gun to bend, which will cause a misrun. If the gun is accidentally tagged on bottom, the gun must be brought out of the hole and replaced with another one.
4. It is advisable to be able to check the line with a digital Blaster's Multimeter, as soon as the gun is attached to the wireline, as soon as the gun is in the hole and immediately before firing the squib. After the charges have been deployed, check again. See procedures throughout this manual.
5. Always pick up guns longer than 6 ft. (1.8 m) long in a lubricator. If a gun is bent in any way, **DO NOT RUN THE GUN.**

## 3.1 Meter Readings from the Line, Gun On Perforating Depth

**Caution:** *The following steps must be followed when the gun is run to perforating depth.*

**Note:** *The following tests must be conducted by connecting the Digital Blaster's Meter or Simpson Meter to the Surface Unit Patch Panel.*

- The gun circuit may be checked with a digital Blaster's Multimeter configured as shown. This meter must be set to test continuity, the continuity test measures the voltage drop across a diode junction.



### 3.1.1 Before the Gun is Opened (Squib Not Initiated)

Connect the positive lead (red wire) to the wireline and the negative lead (black wire) to the ground. Measure the continuity, the meter will read about 1.232 volts to confirm the Squib has not been activated. Remove the meter and continue operations as per Section 5.0.

### 3.1.2 Before the Gun is Detonated (Squib Initiated)

After the Squib has been activated the charges will be deployed and the Firing Head will be activated. Reconnect the Digital Blaster's Meter to the wireline, the positive lead (red wire) to the wireline and the negative lead (black wire) to the ground. Measure the continuity, the meter should read a lower value of about 1.048 volts. If the meter still reads the higher value of about 1.232 volts, the gun has not opened. This change in voltage indicates the squib has activated and the gun is ready to fire.

Example of a typical system test with the Blaster's Multimeter set to test diode;

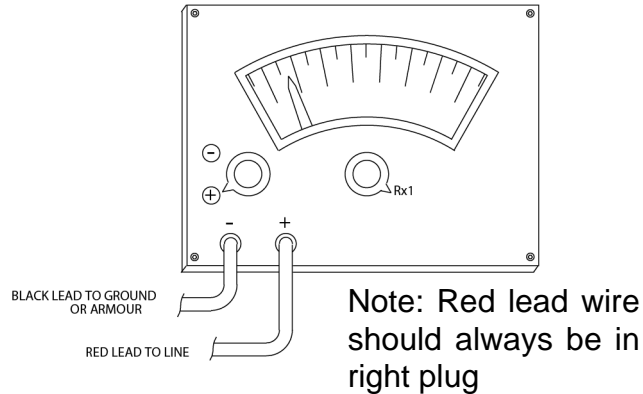
Wireline setup with an Applied Electronics CCL and 100 Ohm wireline resistance, connect the red wire (positive) to the line and the black wire (negative) to the armor/ground. The following readings will be observed:

1. The meter reads 1.232 volts before the gun is opened (prior to firing squib).
2. The meter reads 1.048 volts before the gun is detonated (the squib has fired and operator is ready to fire the gun).

**3.2** If a digital Blaster's Multimeter is not available, the gun circuit may be checked with a Simpson Meter as follows:

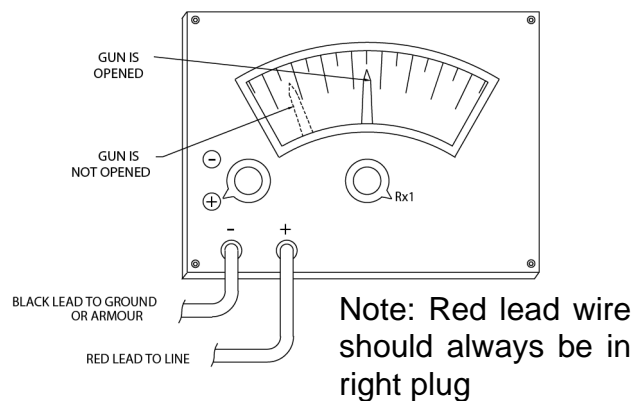
### 3.2.1 Before the Gun is Opened (Squib Not Initiated)

Set the Simpson Meter to measure resistance and switch to -DC. Connect the positive lead (red wire) to the wireline and the negative lead (black wire) to the ground. Measure the resistance, the meter will read as shown to confirm the Squib has not been activated. Remove the meter and continue operations as per Section 5.0.



### 3.2.2 Before the Gun is Detonated (Squib Initiated)

After the Squib has been activated the charges will be deployed and the Firing Head will be activated. With the Simpson Meter set to measure resistance, set the switch to +DC. Reconnect the Simpson Meter to the wireline, the positive lead (red wire) to the wireline and the negative lead (black wire) to the ground. Measure the resistance, the meter should read as shown. If the meter reads high, the gun has not opened. This change in resistance indicates the squib has activated and the gun is ready to fire.



Example of a typical system test with the Simpson Meter set to measure resistance.

Wireline setup with an Applied Electronics CCL with a 100 Ohm wireline resistance, connect the red wire (positive) to the line and the black wire (negative) to the armor/ground. The following readings will be observed:


3. The meter reads 2,100 Ohms before the gun is opened (prior to firing squib).
4. The meter reads 1,900 Ohms before the gun is detonated (the squib has fired and operator is ready to fire the gun).

## 4.0 Running Guidelines

### 4.1 Placing the Gun in the Well

A. Do not place the gun in the well unless a gauge run has been previously run. It cannot be over-stressed that this gun can be easily bent and must be slid from the PVC protective sleeve into the lubricator and must not be allowed to hit bottom anytime, even while in the lubricator, especially if heavy sinker bars are on top of the gun. Do not be tempted to try to attach the gun without laying the lubricator down; the gun is often damaged when trying to attach it in the vertical position.

### 4.2 Running in the Well

 **Caution:** *Do not tag bottom and always make a gauge run first!*

**4.3** It is recommended that a gauge run be made with a rigid string the same OD and 5 ft. (1.5 m) of length before running the first gun in the well.

A. If a gauge run has been made, then the gun can be run in at any reasonable speed, but run very slowly through packers and nipples.

B. Never run a live Swing Jet into a zone previously perforated with a Swing Jet system. The debris previously left in hole may cause damage to the live Swing Jet.

C. Never allow the well to flow after the first run. Debris could flow up and cause a mis-run on subsequent runs.

## 5.0 Firing the Gun

A. After the collar check and the gun is correctly positioned in the shooting zone, the gun is opened by applying negative power. Check the line with a meter (refer to step 2.0) on negative (-) and (+) positive mid range. Slowly raise the current until one amp is applied. The E-86SWG Squib should fire by 0.4 amps (a hesitation of ammeter is an indication the squib fired).

B. Upon firing the release Squib, check gun with meter as before on positive to determine if all charges are successively released, followed by the Trigger being released, which activates the switch in the Firing Head. If the truck is equipped with an Ohm meter to the line, on positive the line will read lower value than the negative leg, until the gun is opened, the meter will read the same resistance as it did on the negative, before the gun was opened (refer to step 3.2).

C. Positive current is then slowly applied until the gun fires or until 1.0 amp has been applied. The E-10 or Unidet should fire at about 0.4 amps (the E-86SWG, E-10, and Unidet are 51 Ohm resistorized caps). Observe the weight indicator for loss of weight.

D. It is often difficult to know whether a gun fires (unless you can electrically check as above). So it is good practice to drop down just deep enough to check

E. If perforations are not detected, then the gun should be raised about 20 ft. (6.1 m) and quickly dropped several times (while monitoring line Ohm meter). This may allow the charges to deploy, in case something has hindered their deployment.

F. If the gun does not fire, then bring the gun out of the hole, slowly through the end of the tubing, nipples, and packers. The charges should be folded back into the folded and locked position when pulling through tubing or a sealing nipple, leaving the last charge to drag. As soon as the gun is removed from the lubricator, place the closure sleeve over the gun, then detach the detonator from the cord then cut the lead wires.



**Note:** *When retrieving an opened gun, the lubricator must be slid down off the gun. The gun will not drop out of the lubricator.*

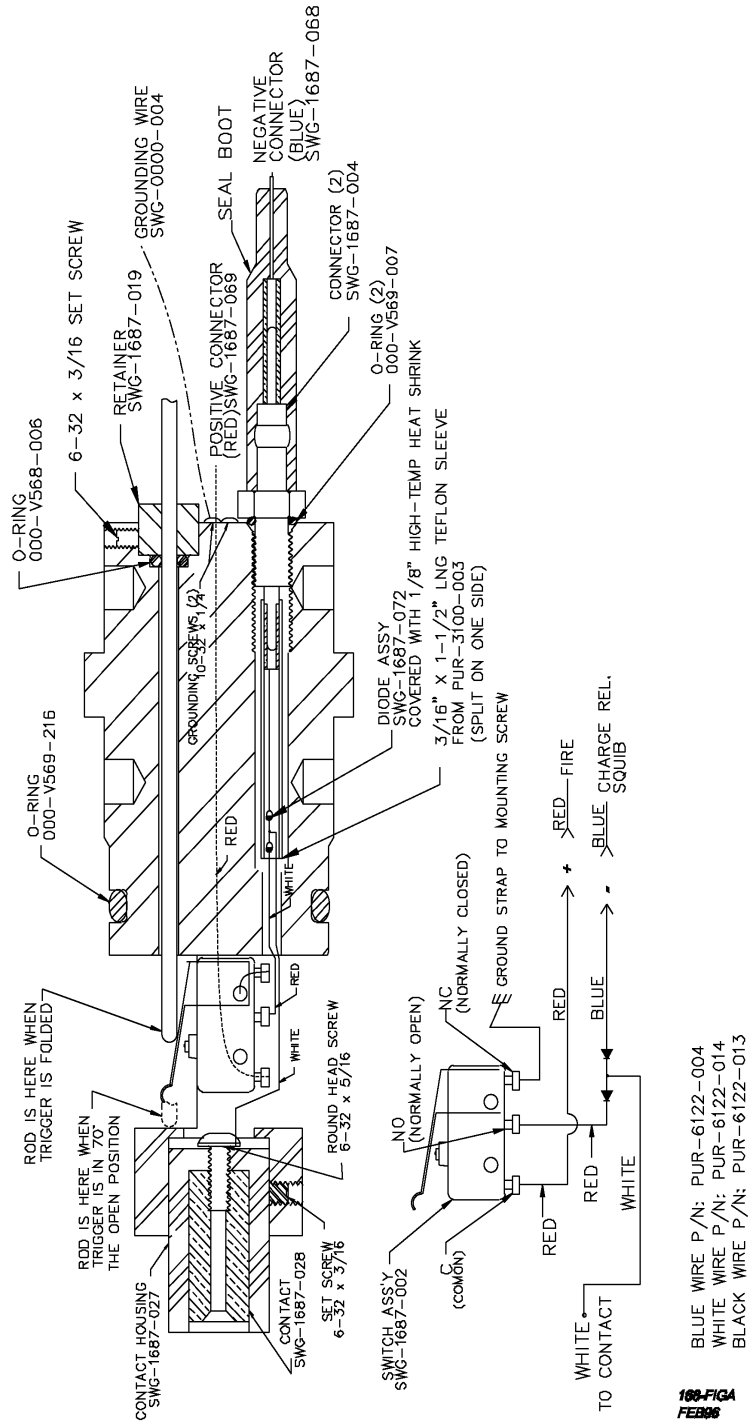
G. A fired gun will leave nothing below the Connector Housing (Item 3) or perhaps 1-1/2 in of the cast iron Trigger Housing (item 4).

H. Sometimes the debris will not fall to the bottom, which will prevent a second run at or below the same depth where the first gun was fired.

### **5.1 Using a Cut-Off Carrier**

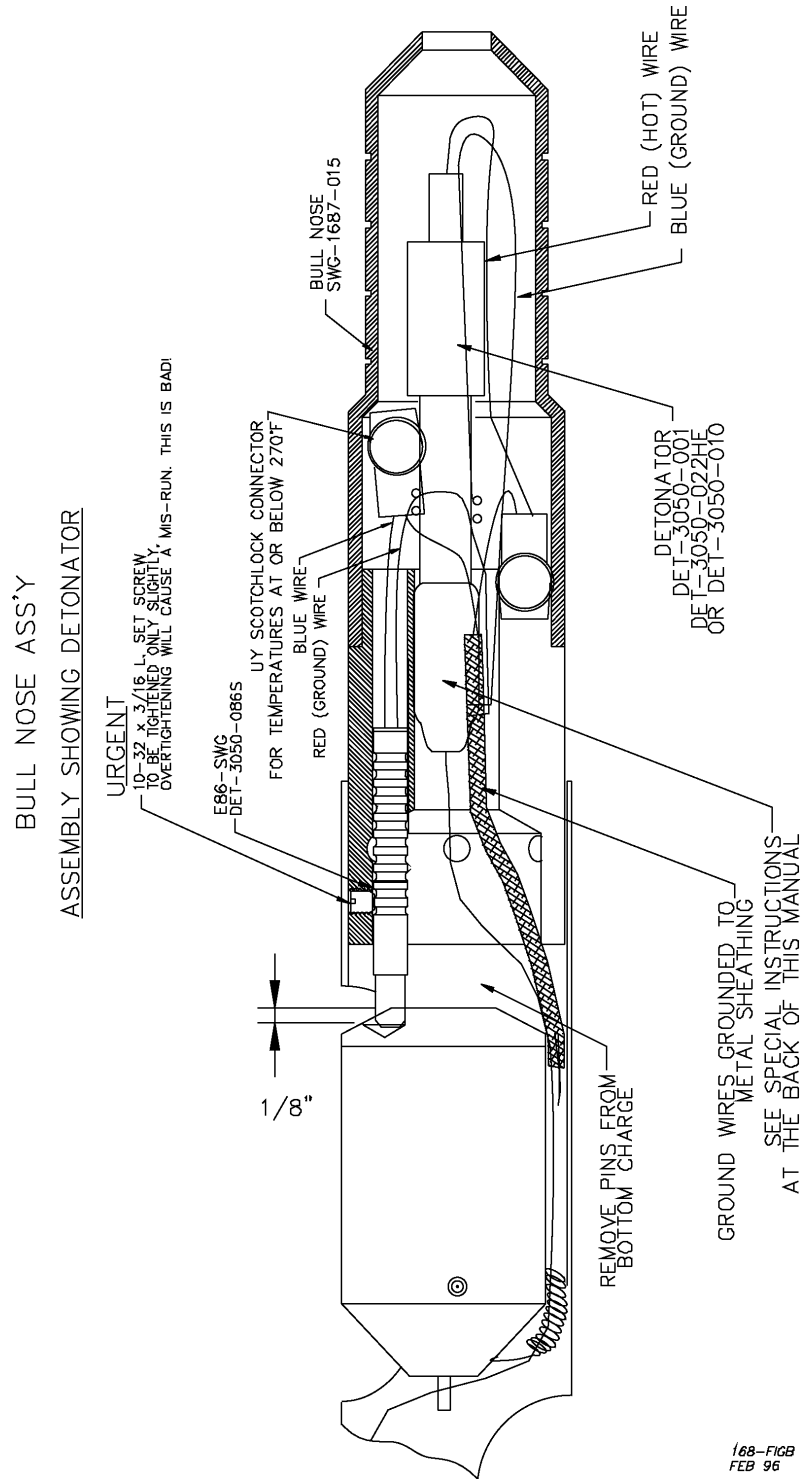
A. Carriers are normally available in lengths of 10, 8, 6, and 4 feet. If the desired length of carrier is not available, cut the bottom of the carrier as shown in Figure F. This is just above the two slots so that a full circumference of tubing is left to attach to.

## Figure A



189-FIGA  
FEB06

Figure B



## Figures C and D

FIGURE "C"

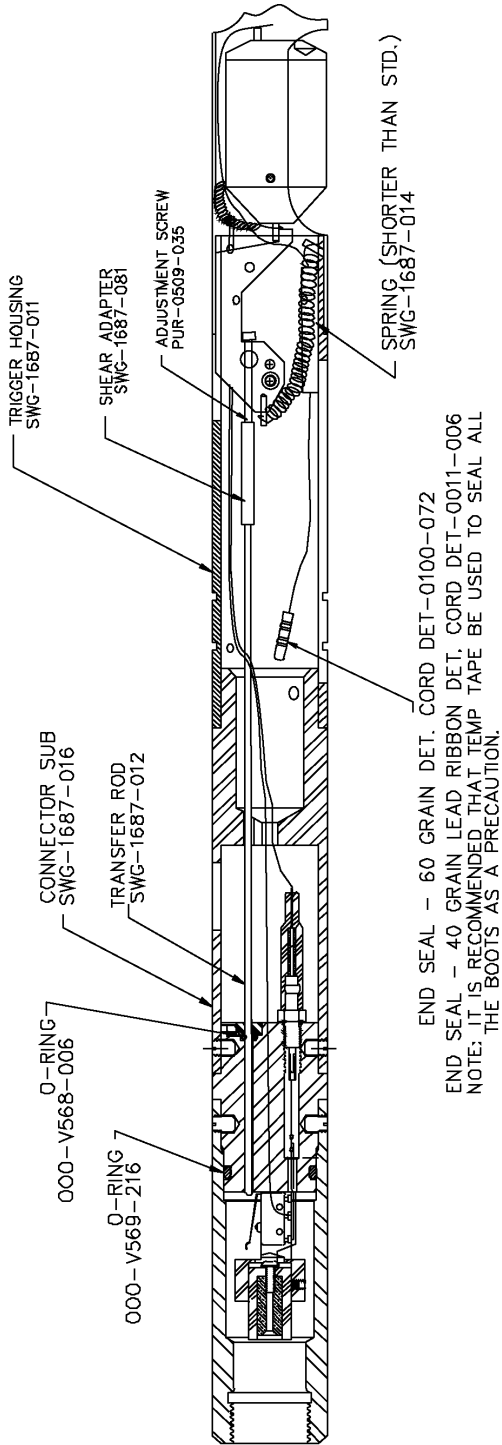
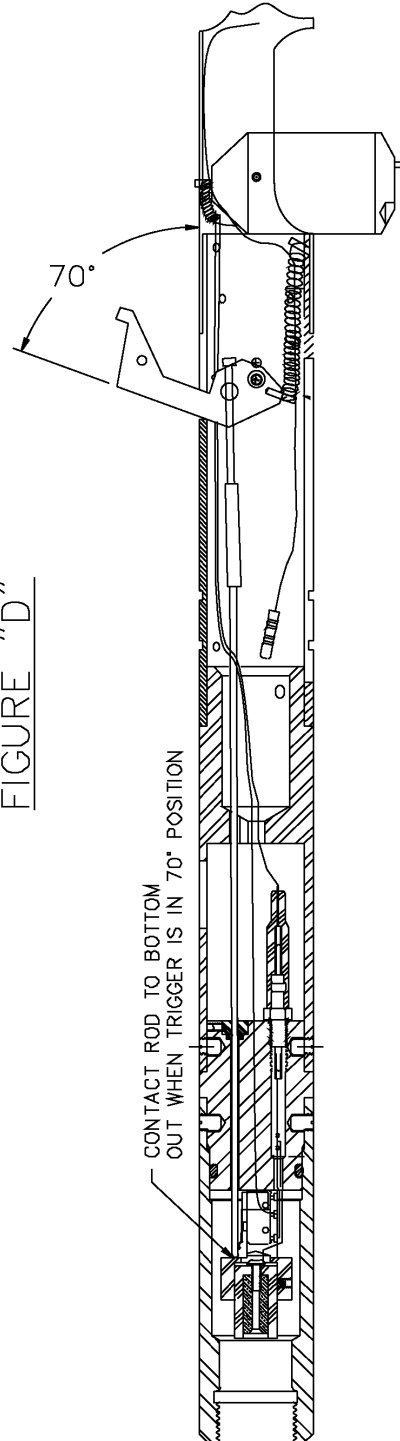
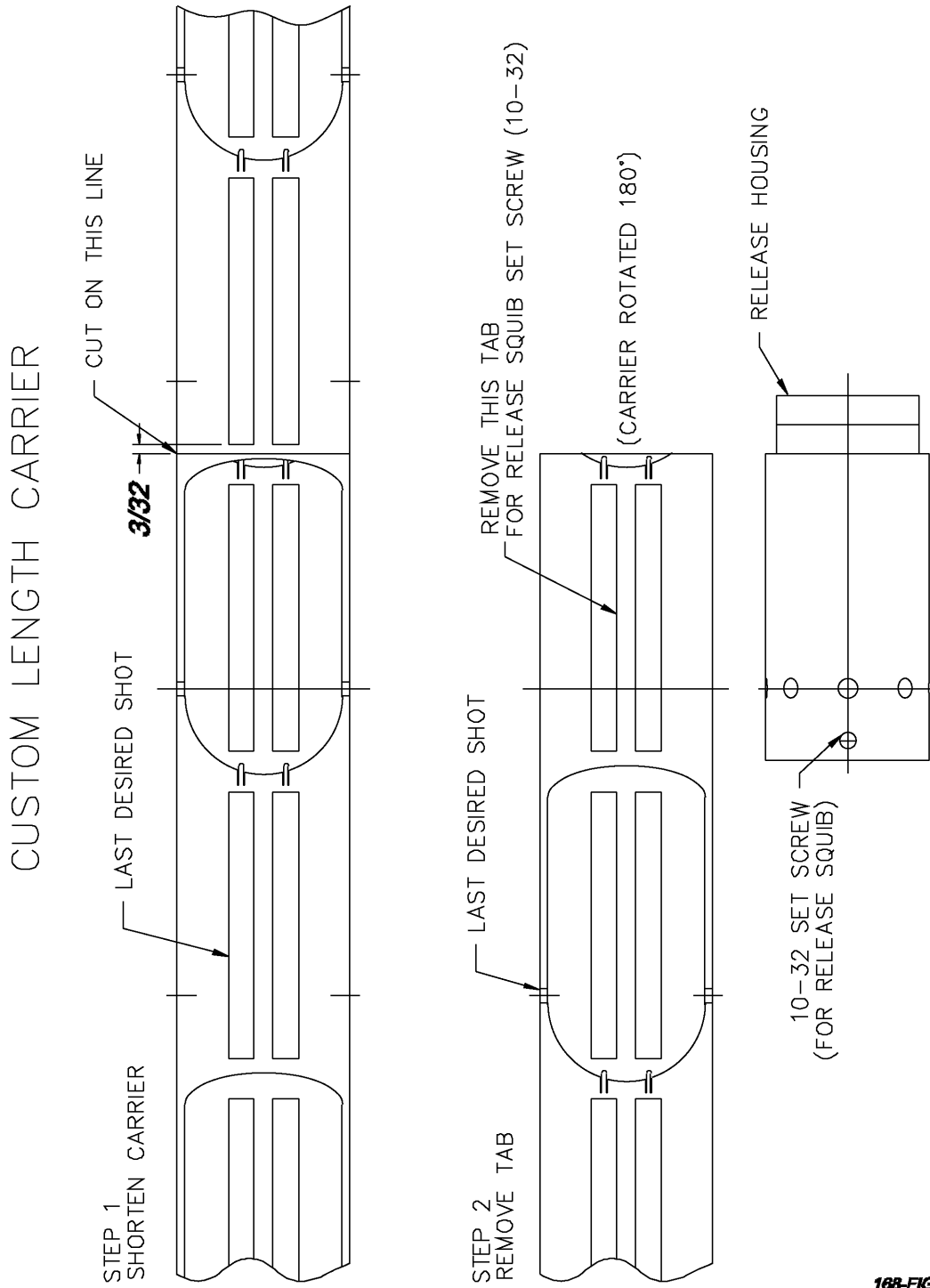


FIGURE "D"



168-FIGC  
JAN96

**Figure F**



168-FIGF  
JAN96

## Recommended Tools

SWG-0000-030		
Part Number	Description	Qty
PUR-0600-049	TOOL BOX - 20IN	1
PUR-0600-005	WIRE STRIPPER (AUTOMATIC)IDEAL45097	1
PUR-0600-021	WRENCH 1/8IN ALLEN FOR 1/4-20IN SET	2
PUR-0600-022	WRENCH 3/32IN ALLEN FOR 10/32IN SET	2
PUR-0600-023	WRENCH 1/16IN ALLEN FOR 8/32IN SET	1
PUR-0600-024	HAMMER - SMALL - 8OZ. MARTIN 103G	1
PUR-0600-025	NEEDLE NOSE PLIERS - SMALL	1
PUR-0600-026	HACK SAW	1
PUR-0600-027	WIRE CUTTERS	1
PUR-0610-003	MULTIMETER BLASTING	1
SWG-0000-003	PLIERS - NEEDLE NOSE GROOVED SJ II	2
SWG-0000-011	WRENCH ADJUSTABLE 8IN MARTIN A8	2
PUR-0600-028	TAPE MEASURE - 16FT	1
PUR-0600-045	SCREWDRIVER - MARTIN SDR8	1
PUR-0600-030	FILE - 8IN	1
TCP-0010-011	KNIFE - RETRACTABLE BLADE UTILITY	1
PUR-0600-034	TAP 10-32	2
PUR-0600-036	TAP 1/4-20	2
PUR-0600-035	WRENCH TAP - SMALL - 0 TO 1/4IN	1
PUR-0600-047	PORTABLE DRILL - SKILL SUPER-TWIST	1
PUR-0600-018	CRIMPER - 317 SCOTCHLOCK UY E-9Y	1
PUR-0600-044	SCREWDRIVER - MARTIN SDR6	1
OOO-V568-006	O-RING VITON-90 DURO PC-#006	25
OOO-V569-216	O-RING VITON-90 DURO PC-#216	25
DET-1687-080	BOOSTER TRANSFER TUBE 5/16INX1IN	10
PUR-6000-005	SEIZING CORD NYLON	1
SWG-0000-004	GROUND WIRE - SJ II BUS WIRE 500/RL	1
PUR-0506-013	ROLL PIN 3/32X1/4IN	200
PUR-0600-038	SET SCREWS #10-32X3/16IN	100
PUR-0600-017	CONNECTOR - 317 SCOTCHLOCK UY	100
SWG-0000-008	PIN TOOL SET	2
SWG-1687-075	REDRESS KIT - 1-11/16IN SJ II F.H.	2
PUR-0210-001	SPLICE BOOT - LEAD WIRE 100/PK 400D	1
SWG-0000-010	WISE & GUIDES - 1-11/16 & 2-1/8 SJ	1
PUR-0006-010	SOLDER ALLOY HMP ERSIN MULTI CORE	1
PUR-0006-021	TOOL - SOLDERING IRON 45W	1
Not included in SWG-0000-030		
SWG-0000-005	SLEEVE TO CLOSE & GAUGE GUN 1-11/16	--
SWG-0000-008B	TOOL 1/8 INSTALL PIN	--