



StimGun™ Technical Manual

MAN-STIM-100 (R01)

OWEN OIL TOOLS

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Trade Policies



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!*



Warning: *This tool should only be assembled and operated by properly trained individuals!*

1.0 Warranty information

1.1 It is expressly agreed that there are no warranties, expressed or implied, of merchantability, fitness or otherwise, made by Owen (hereinafter referred to as "Manufacturer") on equipment, parts or expendable supplies (hereinafter collectively referred to as "Product") sold to the purchaser other than as expressly stated herein. Subject to the terms and conditions hereof, Manufacturer warrants each new piece of Product sold to Purchaser (including original equipment placed thereon by Manufacturer) to be free of defects in materials or workmanship, if, and only if, all of the following conditions are met:

- A. The Product claimed to be defective has been exposed only to normal use and service, has been maintained, and has been used only to Manufacturer's instructions.
- B. Manufacturer is given prompt notice of any such defect.
- C. Purchaser has taken all reasonable steps to mitigate any such defects.

In no event shall the Manufacturer be liable for any injury, loss or damage, direct or consequential, special, incidental, indirect or punitive, arising out of or inability to use the Product sold to Purchaser by Manufacturer.

- 1.2 The extent of Manufacturer's liability and the customer's sole and exclusive remedy hereunder or otherwise shall be the replacement of any such Product at no cost or expense to Purchaser. In no event shall Manufacturer be liable to Purchaser for indirect, punitive, special, incidental or consequential damages.
- 1.3 Each Product (including, without limitation, all perforating systems, StimGun™ Assembly, StimTube™ Tool, WST tool, detonators, boosters, detonating cord, wireline mechanical components, bridge plug systems and all other downhole tools manufactured by Owen Oil Tools) are designed, tested, and qualified to operate properly only when used pursuant to the recommendations that Owen provides to Purchaser. Incorporating any products supplied by third parties, whether ballistic or mechanical, into or while utilizing any Product is not recommended by Owen. Incorporating any third party products may be unsafe and unreliable. Any such incorporation by Purchaser of a third party product shall automatically void the warranties set forth above and Owen takes no responsibility for these products or possible results from using these products.
- 1.4 Each Product has specifications and ratings that are determined by testing, evaluation, or engineering analysis. Purchaser shall notify Manufacturer if use of such Products exceeds 80% of the pressure rating or anytime Purchaser has reason or should have reason to believe that the Product will be utilized in conditions outside the normal operating conditions of the Product. This includes, but is not limited to, pressure, temperature, fluid and time exposure conditions.
- 1.5 Only an officer of the Manufacturer has authority to alter or increase this warranty in any manner whatsoever, and no attempt to repair or promise to repair, replace or improve the Product covered by the warranty by any representative of the Manufacturer shall waive, change or extend this warranty in any manner whatsoever, unless such action, promise or other representation be in writing and signed by an officer of the manufacturer.
- 1.6 The Purchaser warrants through the purchase of the Product that he is familiar with the Product and its proper use. Before using the Product, Purchaser shall give the Product a reasonable and prudent examination and/or tests to determine the suitability of said Product for Purchaser's intended use, and Purchaser assumes all risk and liability whatsoever in connection therewith from the time of delivery to Purchaser.
- 1.7 The Purchaser agrees to indemnify and hold harmless the Manufacturer and its employees, officers, directors, parent, subsidiaries and affiliates, from liability against any and all claims, damages or assertions of liability of every nature whatsoever (other than the limits of liability defined hereunder) to persons or property arising out of or in connection with the sale, handling, use or malfunction of the Product which Manufacturer may deliver to the Purchaser, including but not limited to, any and all claims based upon asserted defects of

materials or workmanship in the manufacture or sale of Manufacturer's Product and any claims in connection with Purchaser's incorporation of any product manufactures by a third party into or while utilizing any Product.

- 1.8** It is further understood that Manufacturer has no obligation under its contractual agreement(s) with customer (if any), to loan its employee(s) to customer as a "Loaned Employee(s) but will do so only at its option and only upon the request of customer. Further, in no event shall Manufacturer be liable for any damage, claim or cause of action resulting from the acts or omissions of "Loaned Employee(s)", and customers assume, and shall indemnify and hold harmless Manufacturer from and against, any such liability.
- 1.9** Owen does not warrant that the products described in this Manual will work properly in all environments and applications, and makes no representation or warranty, express or implied, with respect to their quality, performance, merchantability, or fitness for a particular purpose.
- 1.10** Because of a policy of continuous product improvements, we reserve the right to change designs, materials and/or specifications and to discontinue products without notice.
- 1.11** Failure to enforce any or all of the above terms and conditions in a particular instance or instances shall not constitute a waiver of or preclude subsequent enforcement of any or all of the above terms and conditions.

2.0 Software Modelling

Propellant technology used in the oil industry has had a very long and checkered history and has come a long way, however it is NOT suited to every wellbore. For the highest chance of a successful stimulation, the proposed propellant job should be modeled pre-job using the software model that was designed for StimGun™ and StimTube™ technology. The PulsFrac software is used to determine answers for the following questions.

- Will the stimulation using propellants be beneficial for my wellbore?
- How much propellant is required?
- Will the propellant damage any of the wellbore tubulars?
- If I run this on wireline, will there be any excessive tool jump that may damage the wireline or lose the tool string in the well?
- What will the peak pressure generated be?

Having answers to the above questions does not guarantee a successful job, however, history tells us that it will reduce most of the potential risks that would be encountered if modelling was not performed. The cost and time to run these models are insignificant compared to the total planned expenditure for the job.

3.0 General

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The information in this Manual is subject to change without notice, and Owen makes no commitment to update or keep current the information in this Manual, without regard to any modification or change made by Owen or any third party to the products described herein. It is the responsibility of the user to check for any updates on company website.

All users of the product must first develop their own instruction manual based on their company specific safety policies, procedures, and best practices. All users must also develop their own set of operational procedures for each specific well stimulation.

4.0 Description of Service

The StimGun™ has two major components, a conventional perforating gun and a sleeve made of a propellant. The perforating gun is detonated in the wellbore as normal and during the perforating process, the sleeve is initiated. The sleeve, which is a proprietary mix, burns quickly and produces a burst of high-pressure gas. This high-pressure gas enters the perforation and

creates fractures past damaged zones, etc., and creates an improved flow path for the formation to the wellbore. The sleeves are available to be used in conjunction with all commonly available hollow carrier scalloped perforating gun systems from 2 1/2" through 7" O.D. The StimGun™ can be lowered into the well on wireline, tubing or drill pipe, or with coiled tubing.

5.0 Safety Considerations

With any explosive device one should always follow the most recent guidelines contained in the American Petroleum Institute's Recommended Practice for Oilfield Explosive Safety (API RP-67), and your individual company Safety Policies and Procedures. Following API RP-67 will ensure that the StimGun™ will be handled safely. The StimGun™ utilizes a conventional perforating gun and as such should be handled with the same care given any perforating gun carrier.

The sleeve of the StimGun™ is exposed directly to the wellbore. It is not as rugged as the perforating gun carrier itself. The sleeve is similar to plastic pipe in strength. Care must be used when handling the assembly so as not to impact the sleeve.

The sleeve is brittle and any impact can cause the sleeve to fracture. NEVER secure lifting lines, etc. to the sleeve or allow the assembly to swing and strike the rig structure as this can cause damage to the sleeve. Also, NEVER place wrenches or tongs on the sleeve or set pipe slips on the sleeve. If the sleeve is damaged in any way, it should NOT be run into a wellbore.

The sleeve requires three conditions to ignite, these being: confinement, pressure, and temperature. The sleeve is inert on the surface because these three conditions do not commonly exist. However, there is a chance of a localized sleeve initiation - if the sleeve is impacted. In the wellbore, the sleeve is confined in the casing, there is pressure from the wellbore hydrostatic and sufficient temperature created by the detonation of the perforating charges will cause the sleeve to ignite and rapidly burn.



Note: *The sleeve is impact sensitive, even at surface.*

6.0 Operational Notes

The StimGun™ Assembly consists of the following components:

- A. Perforating gun
- B. Sleeve of Propellant (Explosive 1.4S)
- C. Sleeve retaining rings (OD > sleeve OD) every 3' of sleeve.
- D. Finned subs (OD > sleeve OD) fitted on every gun with sleeve



Warning: *Do not run the job without the correct number of retaining rings and finned subs of the correct OD. This will result in the sleeve igniting while RIH, instead of resulting in sleeve ignition by perforating gun activation!*

The StimGun™ sleeve is rated at 400 degrees F for 1 hour and 342 degrees F for 100 hours.

A minimum perforation density of four shots per foot (spf) is required to adequately ignite the sleeve. However, it is recommended to use at least 6 spf or more when possible.

The StimGun™ should be run at less than 60 ft/min. on wireline. Slow down to <30 ft/min. when passing through fluid level or casing ID changes. If the StimGun™ is run on wireline, the line should be re-headed before each run. This will minimize tool loss upon detonation.

For TCP operations, Owen recommends the pipe used for running is all the same. If Drill Pipe is used, then Owen recommends at least 3 full joints of tubing between the guns and packer. Tubing must be N-80/L-80 or better and in good condition to prevent collapse from the stimulation pressures. The tubing size should be 2 7/8" (at a minimum) for guns 2 1/2" – 4", gun sizes 4 1/2" and larger should be 3 1/2" tubing or larger. Running speed on TCP operations should be <30 ft/min. For vertical wells (defined as any angle between 0 – 45 degrees), the standard finned subs and retaining rings can be used. For Horizontal wells (defined as any deviation >45 degrees), extended range finned subs and retaining rings should be used.



Note: *Do not position retaining rings at the very top and / or the very bottom of gun scallop.*

Check that the sleeves and retaining rings will slide easily over the perforating gun before traveling to location. Remove the sleeves after testing, re-package, and transport to location separately. Prior to fit testing the sleeve on the gun, first inspect the gun for any imperfections (rust, mechanical damage, coatings) that may be larger than the ID of the sleeve. Resolve any of these conditions before sliding sleeve onto gun.



Warning: *NEVER cut the propellant sleeve. The standard length is 36" (3 feet). All lengths must be ordered from Owen in 1ft, 2ft or 3ft lengths (specified in inches)!*

Transportation of Product to Wellsite

The StimGun™ sleeve is a Dangerous Goods (1.4S Explosive). Therefore, whenever the product is transported, it must be in the original PGI packaging. Follow all governmental regulations for the secure transportation and storage of this product.

Wellsite Procedures

The sleeve for a particular operation normally covers approximately 50% of the perforated interval. Sleeves are added as required to provide sufficient coverage. The mid-point of the sleeve should be positioned at the middle of the loaded perforating interval.

The sleeve can be attached to the perforating guns either lying horizontally or on the rig floor hanging vertically (this may or may not be practical), each scenario requires careful appraisal and planning. Each particular operation will differ but as a rule of thumb, short wireline or TCP operations would most likely be done horizontally and longer TCP applications might benefit from the vertical make-up method. The decision of which method to use should rest with the service provider.

Vertical Assembly

Refer to service company specific policies and procedures. The service company responsible for providing this service must be experienced in vertical makeup procedures. If not, then this procedure should not be undertaken until a full Risk Assessment has been conducted.

Horizontal Assembly

1. Place the perforating gun on stands. If there will be only one perforating gun, the finned bull plug will need to be removed.
2. Slide one retaining ring over the gun from the bottom and position the ring just above the top mark on the perforating gun (the top mark will be measured from the center of the proposed sleeve length). Lock the retaining ring in place. Use thread sealant (Loctite) on set screw threads and shoot thru stud.
3. Slide one sleeve section onto the perforating gun from the bottom and rest against the retaining ring. Take care not to damage the sleeve. Do not set the sleeve on loading stands.
4. Slide second retaining ring over the gun from the bottom. Position it on the gun body so that it rests on the bottom of the sleeve. Lock the ring in place and use thread sealant (Loctite) on set screw threads and shoot thru stud.
5. Repeat steps 2-4 until the gun section has the appropriate amount of sleeve attached. A retaining ring is required above and below every 3 feet of sleeve (1 piece). Repeat as necessary to prepare additional gun sections.
6. Attach finned bull plug or additional gun section as required.



Note: *Never place wrenches on sleeve.*

7. Complete system arming and pick up assembly for running in the well. Take care not to damage the sleeve while lifting the StimGun™.
8. The StimGun™ should be lowered into the well at less than 60 ft/min on wireline or less than 30 ft/min for TCP.

Remember, every well is different. For example, pulling out of a deep horizontal well with multiple casing ID changes with an unfired StimGun™ is not the same as a shallow vertical well. The USER of the product must prepare specific procedures based on wellbore configuration, formation parameters, fluid level and other possible scenarios prior to running the job.

7.0 Firing

After the StimGun™ is properly positioned across the perforating interval, the perforating gun is fired as normal. As the perforating jets exit the gun the sleeve will ignite and will be consumed in less than 250 milliseconds.



Warning: *Keep all personnel away from the wellhead when firing the gun! Propellants release large amounts of energy, and if this force is transferred to the surface then problems could arise. It is for this reason that the wellbore must be full of fluid with a minimum 100 foot air gap on top of fluid. Failure to follow this recommendation can result in injury or damage to wellbore asset.*

8.0 Disassembly and Cleaning

The perforating gun can be raised to the surface as normal (follow company specific live- gun procedures if there is no indication of gun detonation, EBBA in reverse as per API RP67). The finned subs may be re-used after cleaning, however, the running diameter of the finned subs must be checked after each run to ensure that the OD of the finned section has not worn below the minimum recommended running diameter O.D, specific to the sleeve OD. The fins are designed to provide protection for the sleeve while lowering into the well.

The remainder of the assembly will be discarded.

If the assembly is brought back to the surface unfired, all of the components of the assembly may be cleaned and re-used/re-run. This is only after all components (finned subs, retaining rings and sleeve), are inspected for any damage or wear. If the sleeve is damaged (cracked), it must be discarded and can return to Owen for disposal (a fee may be charged). If any of the finned subs or retaining rings have worn below their minimum OD, they need to be replaced or repaired.

9.0 Safety Data Sheet (SDS) - provided by Owen

These are available on the OCS website (www.ocsresponds.com), if additional copies are required.

10.0 StimGun™ Job Checklist

StimGun™ job checklist

Use this checklist as an aid to successful job planning and execution.

Pre-job planning

- Request PulsFrac model be run
- Complete Data Input form
- Provide completion details
- Provide any OH logs available

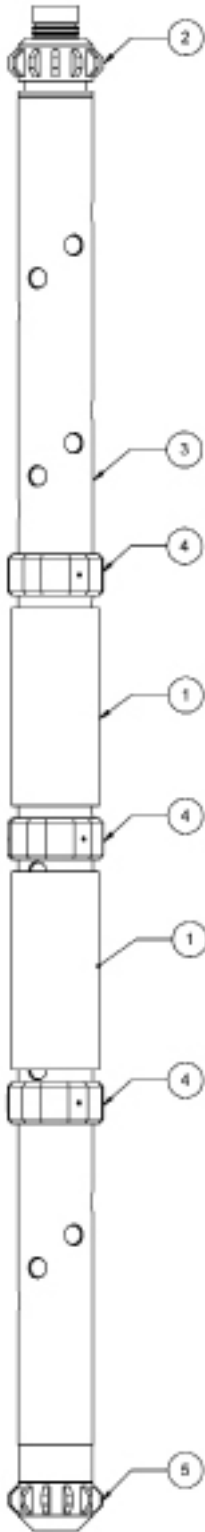
Job plan

- Guns loaded at minimum 4 SPF, 6 SPF recommended
- Check OD of all finned subs and retaining rings.
 - For low angle wells, standard clearance of 1/8" is sufficient.
 - For high angle and Horizontal wellbores, extended range subs are recommended. These have 1/4" clearance.
- Inspect gun for OD defects, inspect sleeve and then fit onto gun.
 - Take care when removing sleeve from cardboard tube.
 - NEVER upend the tube and drop the sleeve onto the floor, this may damage the sleeve.
 - If sleeve is damaged (cracked), do not use.
 - Sleeve must be positioned to be in center of perforated interval.
- Lock in place with retaining rings.
 - Use Loctite on the shoot thru stud and set screws
- Install finned subs at top and bottom of gun
 - Never wrench across or on the sleeve
- When lifting guns, do not sling on material and avoid excessive bending of gun.

- Run the gun assembly into the wellbore at a speed of <60 FPM.
 - For TCP, running speed <30 FPM.
- Reconfirm fluid level in well.
 - If fluid is to surface, make sure all valves are open.
 - Prior to firing gun, clear all people from rig floor and wellhead area
- When spent gun is returned to surface, verify all shots fired and no stim material left on gun.

TECHNICAL INFORMATION:

11.0 BOM and Schematic



BILL OF MATERIAL: 2.5

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T312-25A	STIMGUN™ SLEEVE, 3-1/8" OD X 2-1/2" ID
2A	SGS-2500-280	TOP SUB FINNED, 3.375" OD
2B	SGS-2500-280EX	TOP SUB FINNED, 3.625" OD
3	S25-XXXX-XXXX	OWEN SCALLOPPED GUN, 2-1/2" OD
4A	SGS-2500-075	RETAINING RING ASSY, 3.375" OD
4B	SGS-2500-075EX	RETAINING RING ASSY, 3.625" OD
5A	SGS-2500-078	BULL PLUG FINNED, 3.375" OD
5B	SGS-2500-078EX	BULL PLUG FINNED, 3.625" OD
6A	SGS-2500-281	TANDEM SUB FINNED, 3.375" OD (NOT SHOWN)
6B	SGS-2500-281EX	TANDEM SUB FINNED, 3.625" OD (NOT SHOWN)

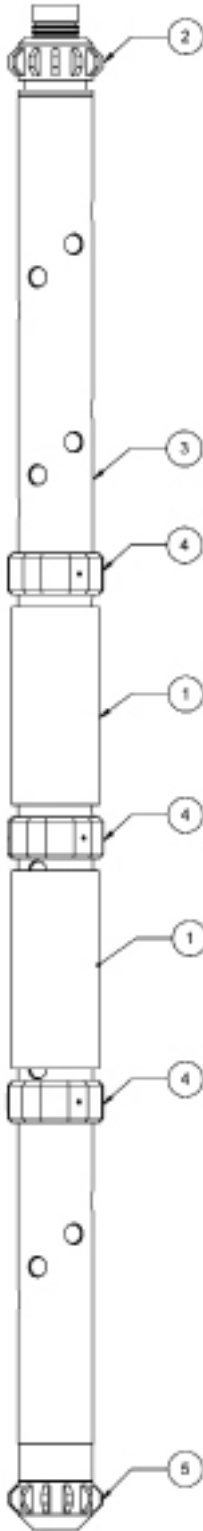
BILL OF MATERIAL: 2.75

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T337-27A	STIMGUN™ SLEEVE, 3-3/8" OD X 2-3/4" ID
2A	SGS-2750-280	TOP SUB FINNED, 3.625" OD
2B	SGS-2750-280EX	TOP SUB FINNED, 3.875" OD
3	S27-XXXX-XXXX	OWEN SCALLOPPED GUN, 2-3/4" OD
4A	SGS-2750-075	RETAINING RING ASSY, 3.625" OD
4B	SGS-2750-075EX	RETAINING RING ASSY, 3.875" OD
5A	SGS-2750-078	BULL PLUG FINNED, 3.625" OD
5B	SGS-2750-078EX	BULL PLUG FINNED, 3.875" OD
6A	SGS-2750-281	TANDEM SUB FINNED, 3.625" OD (NOT SHOWN)
6B	SGS-2750-281EX	TANDEM SUB FINNED, 3.875" OD (NOT SHOWN)

BILL OF MATERIAL: 2.875

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T337-29A	STIMGUN™ SLEEVE, 3-3/8" OD X 2-7/8" ID
2A	SGS-2875-280	TOP SUB FINNED, 3.625" OD
2B	SGS-2875-280EX	TOP SUB FINNED, 3.875" OD
3	S28-XXXX-XXXX	OWEN SCALLOPPED GUN, 2-7/8" OD
4A	SGS-2875-075	RETAINING RING ASSY, 3.625" OD
4B	SGS-2875-075EX	RETAINING RING ASSY, 3.875" OD
5A	SGS-2875-078	BULL PLUG FINNED, 3.625" OD
5B	SGS-2875-078EX	BULL PLUG FINNED, 3.875" OD
6A	SGS-2875-281	TANDEM SUB FINNED, 3.625" OD (NOT SHOWN)
6B	SGS-2875-281EX	TANDEM SUB FINNED, 3.875" OD (NOT SHOWN)

TECHNICAL INFORMATION:



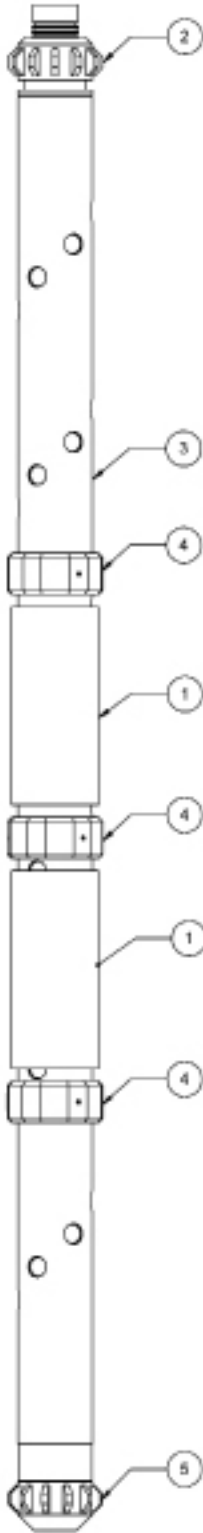
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ITEM	PART NUMBER	DESCRIPTION
1	SGS-T372-31A	STIMGUN™ SLEEVE, 3-3/4" OD X 3-1/8" ID
2A	SGS-3125-280	TOP SUB FINNED, 4.00" OD
2B	SGS-3125-280EX	TOP SUB FINNED, 4.25" OD
3	S31-XXXX-XXXX	OWEN SCALLOPPED GUN, 3-1/8" OD
4A	SGS-3125-075	RETAINING RING ASSY, 4.00" OD
4B	SGS-3125-075EX	RETAINING RING ASSY, 4.25" OD
5A	SGS-3125-078	BULL PLUG FINNED, 4.00" OD
5B	SGS-3125-078EX	BULL PLUG FINNED, 4.25" OD
6A	SGS-3125-281	TANDEM SUB FINNED, 4.00" OD (NOT SHOWN)
6B	SGS-3125-281EX	TANDEM SUB FINNED, 4.25" OD (NOT SHOWN)

BILL OF MATERIAL: 3.375

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T412-33A	STIMGUN™ SLEEVE, 4.026" OD X 3-3/8" ID
2A	SGS-3375-280	TOP SUB FINNED, 4.25" OD
2B	SGS-3375-280EX	TOP SUB FINNED, 4.50" OD
3	S33-XXXX-XXXX	OWEN SCALLOPPED GUN, 3-3/8" OD
4A	SGS-3375-075	RETAINING RING ASSY, 4.25" OD
4B	SGS-3375-075EX	RETAINING RING ASSY, 4.50" OD
5A	SGS-3375-078	BULL PLUG FINNED, 4.25" OD
5B	SGS-3375-078EX	BULL PLUG FINNED, 4.50" OD
6A	SGS-3375-281	TANDEM SUB FINNED, 4.25" OD (NOT SHOWN)
6B	SGS-3375-281EX	TANDEM SUB FINNED, 4.50" OD (NOT SHOWN)

TECHNICAL INFORMATION:



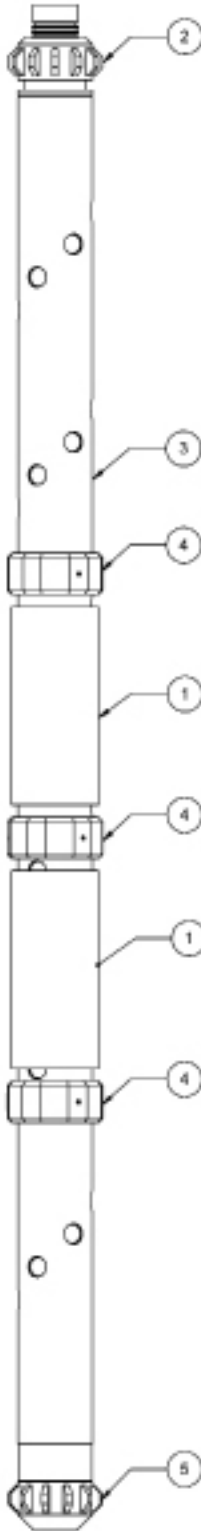
BILL OF MATERIAL: 4.0

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T472-40A	STIMGUN™ SLEEVE, 4-3/4" OD X 4.0" ID
2A	SGS-4000-280	TOP SUB FINNED, 5.00" OD
2B	SGS-4000-280EX	TOP SUB FINNED, 5.25" OD
3	S40-XXXX-XXXX	OWEN SCALLOPPED GUN, 4.00" OD
4A	SGS-4000-075	RETAINING RING ASSY, 5.00" OD
4B	SGS-4000-075EX	RETAINING RING ASSY, 5.25" OD
5A	SGS-4000-078	BULL PLUG FINNED, 5.00" OD
5B	SGS-4000-078EX	BULL PLUG FINNED, 5.25" OD
6A	SGS-4000-281	TANDEM SUB FINNED, 5.00" OD (NOT SHOWN)
6B	SGS-4000-281EX	TANDEM SUB FINNED, 5.25" OD (NOT SHOWN)

BILL OF MATERIAL: 4.625

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T525-46A	STIMGUN™ SLEEVE, 5-1/4" OD X 4-5/8" ID
2A	SGS-4625-280	TOP SUB FINNED, 5.50" OD
2B	SGS-4625-280EX	TOP SUB FINNED, 5.75" OD
3	S46-XXXX-XXXX	OWEN SCALLOPPED GUN, 4-5/8" OD
4A	SGS-4625-070	RETAINING RING ASSY, 5.50" OD
4B	SGS-4625-070EX	RETAINING RING ASSY, 5.75" OD
5A	SGS-4625-078	BULL PLUG FINNED, 5.50" OD
5B	SGS-4625-078EX	BULL PLUG FINNED, 5.75" OD
6A	SGS-4625-281	TANDEM SUB FINNED, 5.50" OD (NOT SHOWN)
6B	SGS-4625-281EX	TANDEM SUB FINNED, 5.75" OD (NOT SHOWN)

TECHNICAL INFORMATION:



BILL OF MATERIAL: 4.5

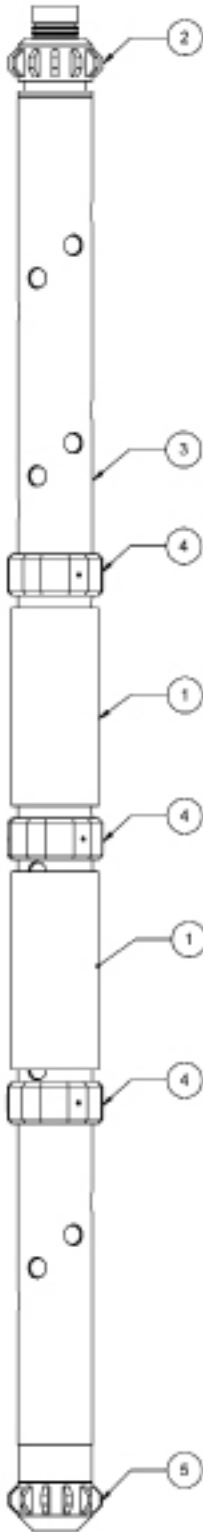
ITEM	PART NUMBER	DESCRIPTION
1	SGS-T525-45A	STIMGUN™ SLEEVE, 5-1/4" OD X 4.50" ID
2A	SGS-4500-280	TOP SUB FINNED, 5.50" OD
2B	SGS-4500-280EX	TOP SUB FINNED, 5.75" OD
3	S45-XXXX-XXXX	OWEN SCALLOPPED GUN, 4.50" OD
4A	SGS-4500-175	RETAINING RING ASSY, 5.50" OD
4B	SGS-4500-175EX	RETAINING RING ASSY, 5.75" OD
5A	SGS-4500-078	BULL PLUG FINNED, 5.50" OD
5B	SGS-4500-078EX	BULL PLUG FINNED, 5.75" OD
6A	SGS-4500-281	TANDEM SUB FINNED, 5.50" OD (NOT SHOWN)
6B	SGS-4500-281EX	TANDEM SUB FINNED, 5.75" OD (NOT SHOWN)

NOTES:

Please note the following critical changes:

1. All new finned subs and rings have a 5.75" OD. The new part number for Rings is SGS-4500-175EX. The new Top Sub, Tandem and Bull Plugs (SGS-4500-280EX, -281EX, -078EX, -078SEX) are marked R1 and have an OD of 5.75".
2. DO NOT use undersized Subs or Rings with the 5-1/4" Sleeve.
3. Owen Oil Tools assumes no responsibility for the use of incorrect or old-design hardware when using the new items referenced above.

TECHNICAL INFORMATION:



BILL OF MATERIAL: 5.125

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T588-51A	STIMGUN™ SLEEVE, 5-7/8" OD X 5-1/8" ID
2A	SGS-5125-280	TOP SUB FINNED, 6.06" OD
2B	SGS-5125-280EX	TOP SUB FINNED, 6.375" OD
3	S51-XXXX-XXXX	OWEN SCALLOPPED GUN, 5-1/8" OD
4A	SGS-5125-070	RETAINING RING ASSY, 6.06" OD
4B	SGS-5125-070EX	RETAINING RING ASSY, 6.375" OD
5A	SGS-5125-078	BULL PLUG FINNED, 6.06" OD
5B	SGS-5125-078EX	BULL PLUG FINNED, 6.375" OD
6A	SGS-5125-281	TANDEM SUB FINNED, 6.06" OD (NOT SHOWN)
6B	SGS-5125-281EX	TANDEM SUB FINNED, 6.375" OD (NOT SHOWN)

BILL OF MATERIAL: 7

ITEM	PART NUMBER	DESCRIPTION
1	SGS-T787-70A	STIMGUN™ SLEEVE, 7-7/8" OD X 7.07" ID (18" long)
2A	SGS-7000-280	TOP SUB FINNED, 8.16" OD
2B	SGS-7000-280EX	TOP SUB FINNED, 8.375" OD
3	S70-XXXX-XXXX	OWEN SCALLOPPED GUN, 7.00" OD
4A	SGS-7000-070	RETAINING COLLAR, 8.16" OD
4B	SGS-7000-070EX	RETAINING COLLAR, 8.375" OD
5A	SGS-7000-078	BULL PLUG FINNED, 8.16" OD
5B	SGS-7000-078EX	BULL PLUG FINNED, 8.375" OD
6A	SGS-7000-281	TANDEM SUB FINNED, 8.16" OD (NOT SHOWN)
6B	SGS-7000-281EX	TANDEM SUB FINNED, 8.375" OD (NOT SHOWN)