GEODynamics®

CONVENTIONAL PERFORATING CATALOG

ISSUE 1 — August 20, 2025

About GEODynamics

GEODynamics is the global technology and manufacturing leader in perforating, downhole completion, intervention, and wireline-conveyed solutions. GEODynamics creates and delivers downhole solutions that enable unsurpassed well economics, performance, and lifespan.

Patents

www.perf.com/patents

Terms and Conditions

www.perf.com/terms-and-conditions

Revisions

ISSUE	DATE	NOTES
1	September 1, 2023	2023 release, issue 1: • Charge performance data updates throughout the catalog for 3-1/8" FracIQ (removed LD charges) and EC2-33A1921-E (perforating conditions). • Updated Detonators, Detonating Cord, and Accessories topic (removed inactive part numbers; added new items). • Added the following conventional long gun systems: 4-5/8" 5 spf HP, 4-3/4" 12 spf XDP, and 4-3/4" 16 spf SBH. • Removed slickwall carriers. • Reduced maximum tensile specification for 3-1/8" conventional (GA and GLB) gun systems (from 245,200 lbf to 202,300 lbf, calculated hardware breaking point). This change made on all relevant gun system pages and the Mechanical Performance Data pages. • Added GIC31-SO02 and GIC31-SO03 gun details (STRATX SandIQ). • Added several new part numbers to Centralizing Gun Connectors. • Added new catalog pages for the 4.50" Centralizing Break-Apart Tandem Sub. • Added new Super Good Hole (SGH) charge, EC2-40S4551, performance data to 7" 12 SPF catalog topic.
1	June 20, 2024	2024 release, Issue 1: • Added shaped charge tables for Bullseye™ PWC and ECLIPSE™ SGH (super good hole) charges in charge performance data by application. • ECLIPSE™ branding updated throughout for this family of gun systems and super good hole charges. • Updated gun swell data for 3-1/8" 12 spf, SBH system. • New catalog pages for 6-5/8" ECLIPSE™ SGH system, Wireline Top Subs, and TCP Transfer Kits. • Updated catalog pages for 7" 12spf DP, GH, PWC, SGH system (added Bullseye™ PWC and ECLIPSE™ SGH shaped charges). • Updated catalog pages for Advanced Eline Solutions (AEL) products. • Content related to EPIC systems (shooting panel, test box, addressable switches, integrated guns) moved to the new EPIC Perforating Catalog.
1	August 20, 2025	2025 release, Issue 1. • New catalog pages for the 3-1/8" SaberJet Flat Pack Ablation perforating system. • Updated all charge performance tables to include performance data updates and specific casing weights used in testing. • Conventional long guns offering streamlined with standard sizes and phasings; additional options available with special order and lead time. • Added long gun tables referencing internal hardware component part numbers: carriers, load tubes, endplates, snap rings, TCP transfer kits. • Added slickwall carriers and blank gun assemblies. • Added 7.11" OD gun systems and performance data for new shaped charges EC2-70D5231-DU and EC2-70D5232-DU.

Table of Contents

Mechanical Performance 5
General Data on Explosives 8
Shaped Charges 9
- Good Hole (GH) 9
- Perf, Wash, Cement (PWC) and Super Good Hole (SGH) 11
- Big Hole (BH) and Super Big Hole (SBH) 12
- Super Big Hole (SBH) and Dual Casing SBH 13
- Deep Penetrating (DP) and Extreme Deep Penetrating (XDP) 14
- Constant Entry Hole (CEH) and Penetration, Spiral Phasing 21
- Constant Entry Hole (CEH) and Penetration, Cluster/Planar Phasing 23
- Constant Entry Hole (CEH) and Penetration, 45° Tilt Angle 24
- Dual Casing 25
- Dynamic Underbalance (DUB) Punchers, Circulating (Tubing Punchers) 26
- Flat Pack Ablation (FPA) for Perf, Wash, Cement (PWC) 27

Detonators, Detonating Cord, and Accessories 28
Bi-Directional Boosters 30
- HMX, DT-BIDI-400 30
- HNS, DT-BIDI-475 31

Conventional Long Guns 32
- 1-9/16 in (40 mm), RTG, 4 and 6 SPF, DP 32
- 1-3/4 in (44 mm), RTG, 6 SPF, DP 35
- 2 in (51 mm), RTG, 4-6 SPF, GH and DP 37
- 2-3/8 in (60 mm), RTG, 5 and 6 SPF, XDP 40
- 2-1/2 in (64 mm), RTG, 4 and 6 SPF, XDP 43
- 2-3/4 in (70 mm), 4 and 6 SPF 46
- 2-7/8 in (73 mm), 4 and 6 SPF 49

SaberJet™ 52
- 3-1/8 in (79 mm), 5.14 SPF, Flat Pack Ablation 52

Conventional Long Guns 56
- 3-1/8 in (79 mm), 4-6 SPF 56
- 3-1/8 in (79 mm), 12 SPF, SBH 61
- 3-3/8 in (86 mm), 4-6 SPF 64
- 3-3/8 in (86 mm), 12 SPF, SBH 68
- 4 in (102 mm), 4-6 SPF, XDP 71

4-1/2 in (114 mm), 4-6 SPF, BH, GH, XDP 74
4-1/2 in (114 mm), 17 SPM 77
4-1/2 in (114 mm), 12 SPF, BH and XDP 80
4-1/2 in (114 mm), 12 SPF, SBH 83
4-5/8 in (117 mm), 5 SPF, BH and XDP, Standard and High-Pressure 85
4-5/8 in (117 mm), 12 SPF, XDP 88
4-5/8 in (117 mm), 12 SPF, SBH 90
4-5/8 in (117 mm), 16 SPF, SBH, Standard and High-Pressure 92
4-3/4 in (121 mm), 12 SPF, XDP 94
4-3/4 in (121 mm), 16 SPF, SBH 96
4-3/4 in (121 mm), 24 SPF, HPHF, SBH 98
5-1/8 in (130 mm), 12 SPF, XDP 100
5-1/8 in (130 mm), 12 SPF, SBH 102
5-1/8 in (130 mm), 16 SPF, SBH 104
5-1/8 in (130 mm), 22 SPF, GH and DP 106

ECLIPSE™ SGH 108
6-5/8 in (168 mm), 15 SPF, SGH 108

Conventional Long Guns 110
6-3/4 in (171 mm), 22 SPF, HPHF, SBH 110
7 in (178 mm), 12 SPF, DP, GH, PWC, SGH 112
7 in (178 mm), 12 SPF, SBH 115
7 in (178 mm), 15 SPF, SBH, Standard and High Pressure 118
7.11 in (181 mm), 15 SPF, SBH 121

ECLIPSE™ SBH 124
7 in (178 mm), 18 SPF, SBH, 360° Channel Finder 124
7 in (178 mm), 20 SPF, SBH 127
7.11 in (181 mm), 20 SPF, SBH 130

Blank Gun and Slickwall Systems 133
Blank Gun Assemblies 133
Slickwall Carriers and Gun Assemblies with Keyway 134

HELLFire® Perforating System 135
3-1/8 in (79 mm), Planar, External Scallops 135
3-3/8 in (86 mm), Planar, Internal and External Scallops 137
4 in (102 mm), Planar, Internal Scallops 140

SandIQ® PRO Perforating System 142
3-1/8 in (79 mm), GT Spiral 142

Conventional Short Guns 145
2-3/4 in (70 mm), GLB Spiral 145
3-1/8 in (79 mm), GLB Spiral 148
3-3/8 in (86 mm), GLB Spiral 153
Conventional Subs 157
Wireline Top Subs (GO Style Quick Change) 157
Booster to Booster Top Subs 158
Booster to Booster Tandem Subs 159
Booster to Booster Two-Piece Tandem Subs, 6-5/8", 6-3/4", and 7" Systems 160
Bull Plugs 161
TCP Transfer Kits 162
Centralizing Gun Connectors (Booster to Booster) 163
3-1/8" and 3-3/8" Conventional Gun Systems 163
4-1/2" and 4-5/8" Conventional Gun Systems 164
4-3/4" Conventional Gun Systems 166
5-1/8" Conventional Gun Systems 167
6-5/8" and 6-3/4" Conventional Gun Systems 169
7" Conventional Gun Systems 170
Centralizing Break-Apart Tandem Sub (Booster to Booster) 172
4-1/2", 4-5/8", and 4-3/4" Conventional Gun Systems 172
Centralizing Rings, 5-1/2" - 8-1/2" O.D. 173
Gun System Thread Protectors 174
Lifting Equipment 175
Lift Sub Assemblies 175
Lifting Clamp Assemblies 176
Support Plates 177
Advanced E-Line Solutions 178
Cableheads 178
Collar Locators (CCL) 179
Sinker Bars 180
Adaptors 181
Centralizers and De-Centralizers 183
Freepoint Tools 184
Additional AEL Parts and Accessories 185

PART NUMBER DESCRIPTIONS 186
LOADED GUN ASSEMBLIES, HELLFIRE®, GLB SHORT GUNS 186
SCALLOPED GUN SYSTEMS, CONVENTIONAL LONG GUNS 187
SHAPED CHARGES 188
NOMENCLATURE 189

Mechanical Performance
Data Summary

GEODynamics®

Carrier O.D. / System Type	SPF / Phasing *(tested)*	Maximum Pressure *(psi) [MPa]*	Maximum Tensile* *(lbf)[kN]*	Charge Size/Type	Charge Part Number	Perforating Condition	API Maximum Gun Swell *(in)[mm]*
1-9/16" GA Series, RTG	4 spf / 0°	20,000 [138]	88,100 [392]	3.2g, HMX, Razor® XDP	EC1-15A0322	In Fluid or Dry	1.69 [42.93]
	6 spf / 60°					Fluid	
	6 spf / 0°			2.9g, HMX, Razor XDP	EC1-15A0322-L	Dry	
1-3/4" GA Series, RTG	6 spf / 0°	20,000 [138]	88,100 [392]	5.1g, HMX, Razor XDP	EC1-17A0522	Fluid	1.91 [48.51]
2" GA Series, RTG	6 spf / 60°	20,000 [138]	153,100 [681]	6.8g, HMX, Razor XDP	EC1-20A0722	Fluid	2.14 [54.36]
	6 spf / 60°			6.5g, HMX, Razor XLS XDP	EC1-20B0722	In Fluid or Dry (6.5g)	2.22 [56.39]
	6 spf / 60°			6.8g, HMX, Connex®	EC1-20A0722-RC	Fluid	2.18 [55.37]
	6 spf / 60°			6.5g, HMX, Connex® XLS	EC1-20B0722-RC	In Fluid or Dry (6.5g)	2.29 [58.16]
2-3/8" GA Series, RTG	6 spf / 60°	20,000 [138]	153,100 [681]	11.0g, HMX, Razor XDP	EC2-23A1122	Fluid	2.56 [65.02]
	6 spf / 60°			11.0g, HMX, Connex	EC2-23A1122-RC		
	6 spf / 60°			10.5g, HMX, Connex XLS	EC2-23A1122-RC-LS	‡ Fluid or Dry (10.5g)	2.62 [66.55]
2-1/2" GA Series, RTG	6 spf / 60°	20,000 [138]	137,500 [612]	11.5g, HMX, Razor XDP	EC2-25A1122	Fluid	2.66 [67.56]
	6 spf / 60°			11.5g, HMX, Connex	EC2-25A1122-RC		
2-3/4" GLB27 Series	6 spf / 60°	25,000 [172]	176,600 [785]	15.0g, HMX, Razor XDP	EC2-27A1522	Fluid	2.90 [73.66]
						Dry	3.02 [76.71]
2-3/4" GA Series	6 spf / 60°	25,000 [172]	176,600 [785]	15.0g, HMX, Razor XDP	EC2-27A1522	Fluid	2.90 [73.66]
	6 spf / 60°					Dry	3.02 [76.71]
	6 spf / 60°			15.0g, HMX, Connex	EC2-27A1522-RC	Fluid	2.91 [73.91]
2-7/8" GA Series, Standard	6 spf / 60°	20,000 [138]	213,700 [950]	15.0g, HMX, Razor XDP	EC2-27A1522	Fluid or Dry	3.13 [79.50]
	6 spf / 60°			15.0g, HMX, Connex	EC2-27A1522-RC		
	6 spf / 60°			18.0g, HMX, Connex	EC2-28A1822-RC	Fluid	3.07 [77.98]
	6 spf / 60°			18.0g, HMX, Razor XDP	EC2-28A1822		
2-7/8" GA Series, HP	6 spf / 60°	25,000 [172]		15.0g, HMX, Razor XDP	EC2-27A1522	Fluid or Dry	3.13 [79.50]
	6 spf / 60°			15.0g, HMX, Connex	EC2-27A1522-RC		

**Hardware calculated breaking point*
‡ For 2-3/8" in dry gas, maximum shot density is 5 spf and limited to low-swell (LS) charges only. Refer to catalog pages for more details.

FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Mechanical Performance
Data Summary

GEODynamics®

Carrier O.D. / System Type	SPF / Phasing *(tested)*	Maximum Pressure *(psi) [MPa]*	Maximum Tensile* *(lbf)[kN]*	Charge Size/Type	Charge Part Number	Perforating Condition	API Maximum Gun Swell *(in)[mm]*
3-1/8" GA Series	6 spf / 60°	22,500 [155]	202,300 [900]	22.7g, HMX, Razor® XDP	EC2-33A2322	Fluid	3.41 [86.61]
	6 spf / 60°			22.7g, HMX, Connex®	EC2-33A2322-RC	Fluid	3.41 [86.61]
	6 spf / 60°			19.0g, HMX, Razor XDP	EC2-33A1922	Fluid	3.46 [87.88]
	5 spf / 60°					‡ Fluid or Dry	3.60 [91.44]
3-1/8" SaberJet™	5.14 spf / 0°-180° 5° rotation every two shots	18,700 [129]	202,300 [900]	23.0g, RDX, Razor FPA	EC2-33A2321-FPA	Fluid	3.33 [84.58]
3-1/8" GA Series, SBH	12 spf / 150°-30°	20,000 [138]	202,300 [900]	12.0g, RDX, Basix SBH	EC2-31B1231	Fluid	3.31 [84.07]
3-1/8" GLB31 Series	6 spf / 60°	22,500 [155]	202,300 [900]	Various Charge Options	See Catalog Pages	Fluid (22.7g)	3.46 [87.88]
	6 spf / 60°					‡ Dry (19.0g)	3.60 [91.44]
3-1/8" GT31, SandIQ® PRO	60° Phase/45° Charge Tilt	22,500 [155]	202,300 [900]	22.7g, RDX, SandIQ®	EC2-33A2371-SF	Fluid	3.46 [87.88]
3-1/8" GHF31 HELLFire	6 shot HELLFire	16,000 [110]	TBD	7.0g, RDX, HELLFire	EC2-31K Series	Fluid	3.46 [87.88]
3-3/8" GHF33, HELLFire	6 shot HELLFire	15,000 [103]	331,900 [1476]	7.0g, RDX, HELLFire	EC2-33K Series	Fluid	3.48 [88.39]
3-3/8" GA Series	6 spf / 60°	22,700 [156]	331,900 [1476]	25.0g, HMX, Razor XDP	EC2-33B2522	Fluid	3.56 [90.42]
	6 spf / 60°			22.7g, HMX, Razor XDP	EC2-33A2322	Fluid or Dry	3.62 [91.95]
	6 spf / 60°			25.0g, HMX, Connex	EC2-33B2522-RC	Fluid	3.56 [90.42]
	6 spf / 60°			22.7g, HMX, Connex	EC2-33A2322-RC	Fluid or Dry	3.63 [92.20]
3-3/8" GA Series, SBH	12 spf / 150°-30°	20,000 [138]	331,900 [1476]	12.0g, RDX, Basix SBH	EC2-31B1231	Fluid	3.46 [87.88]
3-3/8" GLB33 Series	6 spf / 60°	22,700 [156]	331,900 [1476]	Various Charge Options	See Catalog Pages	Fluid (25.0g)	3.56 [90.42]
	6 spf / 60°					Dry (22.7g)	3.63 [92.20]
4" HF Series	6 shot HELLFire®	15,000 [103]	318,000 [1414]	12.0g, RDX, HELLFire	EC2-40K1271	Fluid	4.60 [116.84]
4" GA Series	4 spf / 60°	19,700 [135]	434,400 [1932]	39.0g, HMX, Razor XDP	EC2-40A3922	Fluid	4.16 [105.66]
	4 spf / 60°			39.0g, HMX, Connex	EC2-40A3922-RC		
4-1/2" GA Series	5 spf / 60°	17,700 [122]	517,800 [2303]	39.0g, HMX, Razor XDP	EC2-40A3922	Fluid	4.67 [118.62]
	5 spf / 60°			39.0g, HMX, Connex	EC2-40A3922-RC		
	12 spf / 135°-45°	17,200 [118]		22.7g, HMX, Razor XDP	EC2-33A2322		4.64 [117.86]
	12 spf / 135°-45°			22.7g, HMX, Connex	EC2-33A2322-RC		4.69 [119.13]

**Hardware calculated breaking point*
‡ For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.

FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Mechanical Performance
Data Summary

GEODynamics®

Carrier O.D. / System Type	SPF / Phasing *(tested)*	Maximum Pressure *(psi) [MPa]*	Maximum Tensile* *(lbf)[kN]*	Charge Size/Type	Charge Part Number	Perforating Condition	API Maximum Gun Swell *(in)[mm]*
4-5/8" GA Series, Standard	5 spf / 60°	18,900 [130]	454,600 [2022]	39.0g, HMX, Razor® XDP	EC2-40A3922	Fluid	4.816 [122.33]
4-5/8" GA Series, HP		25,000 [172] @ 250°F					
4-5/8" GA Series, Standard	12 spf / 135°-45°	18,900 [130]	454,600 [2022]	22.7g, HMX, Razor XDP	EC2-33A2322	Fluid	4.69 [119.13]
	16 spf / 140°-20°			26.0g, RDX, Razor SBH	EC2-46A2631	Fluid	4.81 [122.17]
4-5/8" GA Series, HP	16 spf / 140°-20°	20,000 [138] @ 235°F	465,300 [2069]				
4-3/4" GA Series	12 spf / 135°-45°	25,000 [172] @ 260°F	454,600 [2022]	22.7g, HMX, Razor XDP	EC2-33Z2322-RC	Fluid	4.867 [123.62]
	16 spf / 140°-20°	23,000 [158] @ 260°F		26.0g, RDX, Razor SBH	EC2-46A2631	Fluid	4.828 [122.63]
4-3/4" GA Series, HPHF	24 spf / 90°-45°	30,000 [207]	688,000 [3060]	18.0g, HMX, Razor SBH	EC2-48K1832	Fluid	4.81 [122.17]
5-1/8" GA Series	12 spf / 135°-45°	17,200 [118]	461,800 [2054]	19.0g, RDX, Razor DP/GH	See Catalog Pages	Fluid	5.34 [135.64]
	16 spf / 140°-20°			32.0g, RDX, Razor SBH	EC2-51A3231	Fluid	5.33 [135.38]
	22 spf / 140°-20°	15,400 [106]		19.0g, RDX, Razor DP/GH	See Catalog Pages		5.34 [135.64]
6-5/8" ECLIPSE™, SGH	15 spf / 140°-20°	18,700 [129] @ 265°F	944,400 [4201]	45.0g, RDX, ECLIPSE™ SGH	EC2-66S4551	Fluid	6.75 [171.45]
6-3/4" GA Series, HPHF	22 spf / 90°-45°	30,000 [207]	1,229,000 [5466]	52.0g, Razor SBH	EC2-68K5232	Fluid	6.83 [178.48]
7" GA Series	12 spf / 135°-45°	13,500 [93]	770,700 [3428]	39.0g, RDX, Razor DP/GH	EC2-40A3922	Fluid	7.28 [184.91]
				52.0g, RDX, Razor SBH	EC2-70C5231		7.15 [181.61]
7" and 7.11 GA Series	15 spf / 140°-20°	13,500 [93]		52.0g, RDX, Razor SBH	EC2-70C5231	Fluid	7.23 [183.64]
7" GA Series, HP		14,600 [100]					
7" ECLIPSE, SGH 360° Channel Finder	18 spf / 90° Rotated Cluster	11,500 [79]	770,700 [3428]	39.0g, RDX, ECLIPSE SBH	EC2-70K3931	Fluid	7.22 [183.39]
				52.0g, RDX, ECLIPSE SBH	EC2-70K5232		
7" and 7.11" ECLIPSE, SGH	20 spf / 90°-45°	11,500 [79]		39.0g, RDX, ECLIPSE SBH	EC2-70K3931	Fluid	7.22 [183.39]
				52.0g, RDX, ECLIPSE SBH	EC2-70K5232		

**Hardware calculated breaking point*

FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Explosives Supplied by GEODynamics

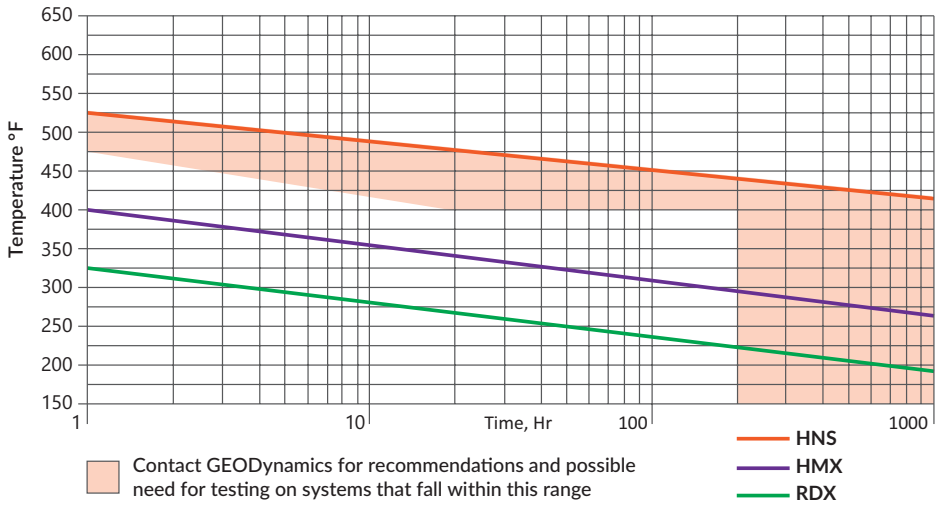
GEODynamics manufactures and supplies an extensive line of high quality, high performance explosive products for use in oil and gas well completions. These products include:

- Shaped charges
- Primer cords (Primacord™)
- Detonators
- Cutters and severing tools
- Setting tools

When loading perforating guns, the explosive materials used in primer cord and shaped charges should be matched. For example, when using HMX shaped charges, HMX primer cord should be used.

Temperature vs. Exposure Time for Common Explosive Materials

The following chart illustrates the maximum temperature and exposure time above which explosive material will exhibit significant degradation and performance will suffer. Effects should be considered irreversible and exposure time is therefore cumulative in case multiple exposure periods occur.



Common Explosive Materials Used in Charges and Primer Cords

RDX (Cyclotrimethylene Trinitramine)

Economical material with good performance. RDX is usually pink in color. Maximum application temperature* is 325°F for one hour or less. Density is 1.82 g/cc. Melting point is 399°F. Detonation velocity is approximately 28,709 ft/sec.

HMX (Cyclotetramethylene Trinitramine)

Used when an explosive with a higher temperature rating and higher performance than RDX is required. HMX is usually white in color. Maximum application temperature* is 400°F for one hour or less. Density is 1.9 g/cc. Melting point is 536°F. Detonation velocity is approximately 29,857 ft/sec.

HNS (Hexanitrosilbene)

Used for applications in which the material will be subjected to high temperatures. HNS is substantially more expensive than RDX or HMX, and performance is less than that of RDX or HMX. HNS is usually pale yellow in color. Maximum application temperature* is 520°F for one hour or less. Density is 1.75 g/cc. Melting point is 600°F. Detonation velocity is approximately 22,967 ft/sec.

**See chart for maximum application temperature ranges*

- Connex® delivers clean, open tunnels independent of rock type. Every tunnel receives its own cleaning action, independent of other perforations, resulting in a much greater percentage of clean tunnels and ideal flow path between undamaged reservoir and the wellbore. Connex charges create a secondary reaction to clear out the compaction zone in a perforating zone. Patented charge liner material deposited along the tunnel reacts exothermically when introduced to heat and pressure. This creates significant pressure within and around the tunnel, breaking up and expelling the crushed zone compacted debris back into the well bore. In sufficiently competent rock, fractures are also formed at the tunnel tip.
- Basix™ delivers impressive quality at an equally impressive price point. High-performing and budget-conscious Basix takes conventional shaped charge technology and kicks it up a notch. Basix charges are available for good hole, big hole, super big hole, and deep-penetration perforating applications.

CONVENTIONAL/UNCONVENTIONAL GOOD HOLE, 2” - 3-1/8” GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2” 6.8g	2007 Basix GH	EC1-20A0742	In Fluid or Dry	6.8g, HMX	4 spf / 0°	3-1/2" 9.2# L-80	0.36 [0.91]	20.52 [52.12]		
2-7/8” 15g	2715 Connex XEH	EC2-27A1541-RC	In Fluid or Dry	15.0g, RDX	6 spf / 60°	4-1/2”			0.30 [0.76]	12.30 [31.24]
		EC2-27A1542-RC		15.0g, HMX					0.35 [0.89]	11.60 [29.46]
3-1/8” 19g	3319 Connex XEH	EC2-33A1941-RC	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
	3319 Basix GH	EC2-33A1941		19.0g, RDX			0.60 [1.52]	28.60 [72.64]		
		EC2-33A1942		19.0g, HMX						
3-1/8” 23g	3323 Connex XEH	EC2-33A2341-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2”			0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341-E		22.7g, RDX		5-1/2" 17.0# L-80	0.43 [1.09]	44.00 [111.76]		
		EC2-33A2342-E		22.7g, HMX						

‡ For 3-1/8” 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500” 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL GOOD HOLE, 3-3/8" - 7" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-3/8" 19g	3319 Connex XEH	EC2-33A1941-RC	In Fluid or Dry	19.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
3-3/8" 23g	3323 Connex XEH	EC2-33A2341-RC	In Fluid or Dry	22.7g, RDX					0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341		22.7g, RDX			0.52 [1.32]	33.58 [85.29]		
		EC2-33A2342		22.7g, HMX						
3-3/8" 25g	3325 Connex XEH	EC2-33B2541-RC	Fluid	25.0g, RDX						
		EC2-33B2542-RC		25.0g, HMX					0.40 [1.02]	14.92 [37.90]
	3325 Basix GH	EC2-33B2541		25.0g, RDX			0.57 [1.45]	25.91 [65.81]	0.50 [1.27]	16.50 [41.91]
4-1/2" 23g	3323 Connex XEH	EC2-33A2341-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	7.0"			0.34 [0.86]	14.72 [37.39]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
5-1/8" 19g	3319 Razor GH	EC2-33A1941-G	Fluid	† 19.0g, RDX	22 spf / 140°-20°	7-5/8"			0.37 [0.94]	12.10 [30.73]
		EC2-33A1942-G		† 19.0g, HMX						
	3319 Basix GH	EC2-33A1941-EG		† 19.0g, RDX			0.37 [0.94]	25.20 [64.01]		
		EC2-33A1942-EG		† 19.0g, HMX						
7" 39g	4039 Basix GH	EC2-40A3941	Fluid	39.0g, RDX	12 spf / 135°-45°	9-5/8" 47.0# L-80	0.80 [2.03]	15.42 [39.17]		
		EC2-40A3942	Fluid	39.0g, HMX						

† 33A charge case must be grooved. For 5-1/8" 22 spf, max. explosive load is 19g.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Shaped Charges
Perf, Wash, Cement (PWC) and Super Good Hole (SGH)

GEODynamics' super good hole (SGH) charges maintain hole size with more penetration compared to big hole charges.

- Bullseye™ shaped charges are tailored to optimize effective perf, wash, and cement operations in multiple casing sizes and weights.
- ECLIPSE™ and Razor® 39- and 45-gram charges provide a superior alternative to big hole/deep penetrating charges for wash out and dual casing applications.

CONVENTIONAL PERF, WASH, AND CEMENT, 7" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Casing O.D.	Performance in Concrete	
						Application	**Avg. EHD** *(in)[cm]*	**Avg. Penetration** *(in)[cm]*
7" 39g	4039 Bullseye SGH, RDX 40A, *Steel Case*	EC2-40S3991	Fluid	39.0g, RDX	12 spf / 135° - 45°	9-5/8", 53.5# L-80	0.61 [1.55]	23.4 [59.44]
						9-5/8", 53.5# P-110	0.59 [1.50]	
						9-5/8", 53.5# HCG-125	0.55 [1.40]	
						13-3/8", 72# L-80	0.51 [1.30]	17.6 [44.70]
						13-3/8", 72# P-110	0.48 [1.22]	
						13-3/8", 72# HCG-125	0.43 [1.09]	

Above data is based on centralized gun position and a general selection of casing options. Charges are available in RDX, HMX, and HNS, and also with zinc cases (e.g., EC2-40SZ3991).

CONVENTIONAL SUPER GOOD HOLE, 6-5/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
6.625" 45g	6625 ECLIPSE SGH 66S, *Steel Case*	EC2-66S4551	Fluid	45g, RDX	15 spf / 140°-20°	9-5/8" 47# L-80	0.87 [2.21]	15.00 [38.10]		
		EC2-66S4552		45g, HMX						
		EC2-66S4553		45g, HNS						

66S SGH charges also available with zinc cases (e.g., EC2-66SZ4551). Contact your sales representative for additional testing services.

CONVENTIONAL SUPER GOOD HOLE, 7" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" 45g	4045 Razor SGH 40A, *Steel Case*	EC2-40S4551	Fluid	45g, RDX	12 spf / 135°-45°	9-5/8" 47# L-80	0.90 [2.29]	22.01 [55.91]		
		EC2-40S4552		45g, HMX						
		EC2-40S4553		45g, HNS						

40S SGH charges available with 39 gram or 45 gram explosive loads, and with zinc cases (e.g., EC2-40SZ3951, EC2-40SZ4551). Contact your sales representative for additional testing services.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:32 PM

Patents: www.oilstatesintl.com/patents

Shaped Charges
Big Hole (BH) and Super Big Hole (SBH)

- Basix™ delivers impressive quality at an equally impressive price point. High-performing and budget-conscious Basix takes conventional shaped charge technology and kicks it up a notch. Basix charges are available for good hole, big hole, super big hole, and deep-penetration perforating applications.
- Razor® delivers industry-leading shaped charge performance, achieved by combining cutting-edge designs, state-of-the-art production processes, and rigorous quality control. When the amount of area open to flow is critical, Razor SBH leads the way with the industry's largest entry hole and flow area performance.

CONVENTIONAL/UNCONVENTIONAL BIG HOLE, 3-1/8" - 4-1/2" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80	0.78 [1.98]	7.60 [19.30]		
		EC2-33A2332		22.7g, HMX			0.79 [2.01]	7.80 [19.81]		
3-3/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	5-1/2" 17.0# L-80	0.70 [1.78]	5.79 [14.71]	0.69 [1.75]	4.05 [10.29]
		EC2-33A2332		22.7g, HMX						
4-1/2" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	12 spf/135°-45°	7.0" 32.0# L-80	0.81 [2.06]	5.28 [13.41]	0.78 [1.98]	5.00 [12.70]
		EC2-33A2332		22.7g, HMX					0.80 [2.03]	5.30 [13.46]
4-1/2" 39g	4039 Basix BH	EC2-40A3931	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80	0.86 [2.18]	6.13 [15.57]		
		EC2-40A3932		39.0g, HMX						

CONVENTIONAL/UNCONVENTIONAL SUPER BIG HOLE, 3-1/8" - 4-5/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 12g	3112 Basix SBH *Steel Case*	EC2-31B1231	Fluid	12.0g, RDX	12 spf/150°	5.0" 15.0# L-80	0.70 [1.78]	5.60 [14.22]	0.65 [1.65]	4.60 [11.68]
		EC2-31B1232		12.0g, HMX						
3-3/8" 12g	3112 Basix SBH *Steel Case*	EC2-31B1231	Fluid	12.0g, RDX	12 spf/150°	5-1/2" 17.0# L-80	0.71 [1.80]	5.88 [14.94]	0.66 [1.68]	4.70 [11.94]
		EC2-31B1232		12.0g, HMX						
4-1/2" 26g	4526 Basix SBH TL *Steel Case*	EC2-45B2631	Fluid	26.0g, RDX	12 spf/135°-45°	7.0" 32.0# L-80	0.87 [2.21]	5.67 [14.40]		
		EC2-45B2632		26.0g, HMX	16 spf/ 140°-20°		0.93 [2.36]	5.77 [14.66]		
4-5/8" 26g	4626 Razor SBH TL LD *Zinc Case*	[1] EC2-46A2631	Fluid	26.0g, RDX	16 spf/ 140°-20°	7.0" 32.0# L-80	0.90 [2.29]	5.50 [13.97]		
		[1] EC2-46A2632		26.0g, HMX						
		[1] EC2-46A2631		26.0g, RDX		7-3/4" 46.1# C-110	0.96 [2.44]	5.40 [13.72]		
	4526 Basix SBH TL *Steel Case*	EC2-45B2631		26.0g, RDX		7.0" 32.0# L-80	0.94 [2.39]	6.27 [15.93]		
		EC2-45B2632		26.0g, HMX						
	4626 Basix SBH TL *Steel Case*	EC2-46B2631		26.0g, RDX			0.94 [2.39]	6.27 [15.93]		
		EC2-46B2632		26.0g, HMX						

Maximum shot density in 4-1/2" carrier is 12 spf. Charge cases 45B, 46A, 46B with 26g load are compatible with 4-1/2" carrier and 4046A load tube.
[1] Blank charge case P/N: EP-1085-100-D (4-1/2" BH LD, zinc).

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:32 PM

CONVENTIONAL/UNCONVENTIONAL SUPER BIG HOLE, 4-3/4" - 7" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-3/4" 18g	4818 Razor SBH *Steel Case*	EC2-48K1831	Fluid	18.0g, RDX	24 spf/ 90°-45°	7.0" 31.7# L-80				
		EC2-48K1832		18.0g, HMX			0.73 [1.85]	4.81 [12.22]		
						7-3/4" 45.51# Q-125	0.63 [1.60]	3.70 [9.40]		
5-1/8" 32g	5132 Razor SBH TL LD *Zinc Case*	EC2-51A3231	Fluid	32.0g, RDX	16 spf / 140°-20°	7-5/8" 33.7# L-80	1.07 [2.72]	6.60 [16.76]		
		EC2-51A3232		32.0g, HMX						
	5132 Razor SBH LD *Steel Case*	EC2-51B3231		32.0g, RDX	12 spf/135°-45°		1.05 [2.67]	7.08 [17.98]		
				32.0g, RDX	16 spf / 140°-20°		1.05 [2.67]	6.88 [17.48]		
6-3/4" 52g	6852 Razor SBH *Steel Case*	EC2-68K5231	Fluid	52.0g, RDX	22 spf/ 90°-45°	9-5/8" 46.18# L-80				
		EC2-68K5232		52.0g, HMX			1.08 [2.74]	5.62 [14.27]		
						9-7/8" 61.80# Q-125	0.97 [2.46]	5.35 [13.59]		
7" or 7.11" 39g	7039 Razor SBH TL LD *Zinc Case*	EC2-70C3931	Fluid	39.0g, RDX	15 spf / 140°-20°	9-5/8" 47.0# L-80	1.24 [3.15]	7.08 [17.98]		
		EC2-70C3932		39.0g, HMX						
	7039K ECLIPSE SBH *Steel Case*	EC2-70K3931		39.0g, RDX	20 spf / 90°-45°		1.04 [2.64]	6.31 [16.03]	1.10 [2.79]	4.40 [11.18]
		EC2-70K3932		39.0g, HMX					1.18 [3.00]	4.60 [11.68]
7.11" 52g	7052 Razor SBH TL LD *Zinc Case*	EC2-70C5231	Fluid	52.0g, RDX	15 spf / 140°-20°	9-5/8" 47.0# L-80	1.39 [3.53]	6.50 [16.51]		
		EC2-70C5232		52.0g, HMX						
		EC2-70C5231	Fluid	52.0g, RDX	15 spf / 140°-20°	10-1/8" 79.75# SM-125S	1.12 [2.84]	6.60 [16.76]		
7.11" 52g	7052K ECLIPSE SBH *Steel Case*	EC2-70K5231	Fluid	52.0g, RDX	20 spf / 90°-45°	9-5/8" 47.0# L-80	1.41 [3.58]	5.67 [14.40]		
		EC2-70K5232		52.0g, HMX		9-5/8" 53.5# L-80	1.42 [3.61]	7.06 [17.93]		

DUAL CASING SUPER BIG HOLE, 7.11" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing		*Penetration
						OD/Wt/ Material	**Exit Hole** *(in)[cm]*	**OD/Wt/ Material**	**Exit Hole** *(in)[cm]*	*(in)[cm]*
7.11" 52g	7052 Razor Dual Casing SBH 70D, *Steel Case*	EC2-70D5231-DU	Fluid	52g, RDX	15 spf / 140°-20°	9-7/8" 62.8# Q-125	0.75 [1.91]	11-7/8" 71.8# Q-125	0.63 [1.60]	10.00 [25.40]
		EC2-70D5232-DU		52g, HMX		9-7/8" 62.8# Q-125	0.76 [1.93]	11-7/8" 71.8# Q-125	0.64 [1.63]	10.60 [26.92]

**Coupon tests; penetration through cement target. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

- Connex® delivers clean, open tunnels independent of rock type. Every tunnel receives its own cleaning action, independent of other perforations, resulting in a much greater percentage of clean tunnels and ideal flow path between undamaged reservoir and the wellbore.
- Connex charges create a secondary reaction to clear out the compaction zone in a perforating zone. Patented charge liner material deposited along the tunnel reacts exothermically when introduced to heat and pressure. This creates significant pressure within and around the tunnel, breaking up and expelling the crushed zone compacted debris back into the well bore. In sufficiently competent rock, fractures are also formed at the tunnel tip.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 1-9/16" - 1-3/4" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
1-9/16" 3.2g	1503 Connex SDP	EC1-15A0321-RC	Fluid	3.2g, RDX	6 spf / 60°	2-7/8" 6.5# L-80			0.17 [0.43]	4.90 [12.45]
		EC1-15A0322-RC		3.2g, HMX					0.17 [0.43]	6.80 [17.27]
	1503 Razor XDP	EC1-15A0321	Fluid	3.2g, RDX	6 spf / 60°		0.17 [0.43]	12.13 [30.81]	0.13 [0.33]	5.30 [13.46]
		EC1-15A0322	In Fluid or Dry	3.2g, HMX	4 spf / 0°		0.19 [0.48]	13.09 [33.25]		
			Fluid		6 spf / 60°		0.19 [0.48]	13.09 [33.25]	0.13 [0.33]	5.23 [13.28]
		EC1-15A0323		3.2g, HNS					0.11 [0.28]	5.00 [12.70]
1-9/16" 2.9g	1503 Razor XDP LS	EC1-15A0321-L	Dry	2.9g, RDX	6 spf / 0°					
		EC1-15A0322-L		2.9g, HMX			0.19 [0.48]	12.80 [32.51]	0.18 [0.46]	6.50 [16.51]
1-3/4" 5.1g	1705 Connex SDP	EC1-17A0521-RC	Fluid	5.1g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.21 [0.53]	7.40 [18.80]
		EC1-17A0522-RC		5.1g, HMX					0.21 [0.53]	8.70 [22.10]
	1705 Razor XDP	EC1-17A0521		5.1g, RDX	6 spf / 0°					
		EC1-17A0522		5.1g, HMX			0.26 [0.66]	21.63 [54.94}	0.20 [0.51]	7.70 [19.56]
		EC1-17A0523		5.1g, HNS					0.19 [0.48]	6.20 [15.75]
	1705E Basix XDP	EC1-17A0521-E		5.1g, RDX	6 spf / 60°					
		EC1-17A0522-E		5.1g, HMX						

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 2” - 2-3/8” GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2” 6.8g	2007 Connex SDP	EC2-20A0721-RC	Fluid	6.8g, RDX	6 spf / 60°	2-7/8”			0.22 [0.56]	8.94 [22.71]
		EC2-20A0722-RC		6.8g, HMX					0.22 [0.56]	9.37 [23.80]
		EC2-20A0723-RC		6.8g, HNS					0.20 [0.51]	7.30 [18.54]
	2007 Razor XDP	EC1-20A0721	Fluid	6.8g, RDX	6 spf / 60°	3-1/2" 9.2# L-80	0.25 [0.64]	21.83 [55.45]	0.22 [0.56]	9.55 [24.26]
		EC1-20A0722		6.8g, HMX			0.24 [0.61]	24.40 [61.98]		
		EC1-20A0722		6.8g, HMX		2-7/8” 6.4# L-80	0.25 [0.64]	22.30 [56.64]		
	2007E Basix XDP	EC1-20A0721-E	Fluid	6.8g, RDX	6 spf / 60°	3-1/2" 9.2# L-80	0.25 [0.64]	16.42 [41.71]		
		EC1-20A0722-E		6.8g, HMX			0.25 [0.64]	20.70 [52.58]	0.24 [0.61]	8.40 [21.34]
2” 6.5g	2007 Connex SDP XLS	EC2-20B0721-RC	In Fluid or Dry	6.5g, RDX	6 spf / 60°	2-7/8” 6.4# L-80			0.23 [0.58]	8.70 [22.10]
		EC2-20B0722-RC		6.5g, HMX					0.21 [0.53]	9.80 [24.89]
	2007 Razor XLS XDP	EC1-20B0721		6.5g, RDX						
		EC1-20B0722		6.5g, HMX			0.25 [0.64]	22.30 [56.64]	0.19 [0.48]	10.80 [27.43]
2-3/8” 11g	2311 Connex SDP	EC2-23A1121-RC	Fluid	11.0g, RDX	6 spf /60°	3-1/2" 9.2# L-80			0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC		11.0g, HMX					0.31 [0.79]	11.35 [28.83]
		EC2-23A1123-RC		11.0g, HNS					0.23 [0.58]	8.70 [22.10]
	2311 Razor XDP	EC2-23A1121		11.0g, RDX					0.25 [0.64]	12.70 [32.26]
		EC2-23A1122		11.0g, HMX			0.31 [0.79]	30.11 [76.48]	0.24 [0.61]	11.40 [28.96]
		EC2-23A1123		11.0g, HNS			0.25 [0.64]	22.70 [57.68]	0.23 [0.58]	9.20 [23.37]
	2311 Basix XDP	EC2-23A1121-E		11.0g, RDX					0.30 [0.76]	9.00 [22.86]
		EC2-23A1122-E		11.0g, HMX						
2-3/8” 10.5g	2311 Razor XDP LS	EC2-23A1121-LS	Dry	10.5g, RDX	‡ 5 spf / 0°	3-1/2” 9.2# L-80				
		EC2-23A1122-LS		10.5g, HMX			0.31 [0.79]	30.11 [76.48]		
		EC2-23A1121-LS	Fluid	10.5g, RDX	6 spf / 0°					
		EC2-23A1122-LS		10.5g, HMX			0.31 [0.79]	30.11 [76.48]		
2-3/8” 10.5g	2311 Connex SDP XLS	EC2-23A1121-RC-LS	Dry	10.5g, RDX	‡ 5 spf / 60°	3-1/2”			0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC-LS		10.5g, HMX					0.31 [0.79]	11.35 [28.83]
		EC2-23A1121-RC-LS	Fluid	10.5g, RDX	6 spf / 60°				0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC-LS		10.5g, HMX					0.31 [0.79]	11.35 [28.83]

‡ *For 2-3/8” in dry gas, maximum shot density is 5 spf and limited to low-swell (LS) charges only.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500” 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 2-1/2" - 2-7/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2-1/2" 11.5g	2511 Connex SDP	EC2-25A1121-RC	Fluid	11.5g, RDX	6 spf /60°	3-1/2" 9.2# L-80			0.28 [0.71]	11.50 [29.21]
		EC2-25A1122-RC		11.5g, HMX					0.29 [0.74]	12.00 [30.48]
	2511 Razor XDP	EC1-25A1121		11.5g, RDX					0.26 [0.66]	13.00 [33.02]
		EC1-25A1122		11.5g, HMX			0.32 [0.81]	31.10 [78.99]	0.24 [0.61]	12.23 [31.06]
	2511 Basix XDP	EC2-25A1121-E		11.5g, RDX					0.30 [0.76]	9.10 [23.11]
		EC2-25A1122-E		11.5g, HMX						
2-3/4" 15g	2715 Connex SDP	EC2-27A1521-RC	In Fluid or Dry	15.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.30 [0.76]	11.70 [29.72]
		EC2-27A1522-RC		15.0g, HMX					0.31 [0.79]	12.18 [30.94]
	2715 Razor XDP	EC2-27A1521		15.0g, RDX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1522		15.0g, HMX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1523		15.0g, HNS					0.31 [0.79]	10.50 [26.67]
	2715 Basix XDP	EC2-27A1521-E		15.0g, RDX			0.39 [0.99]	31.80 [80.77]	0.32 (0.81)	9.40 [23.88]
		EC2-27A1522-E		15.0g, HMX			0.38 [0.97]	32.75 [83.19]	0.35 [0.89]	10.60 [26.92]
2-7/8" 15g	2715 Connex SDP	EC2-27A1521-RC	In Fluid or Dry	15.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.30 [0.76]	11.70 [29.72]
		EC2-27A1522-RC		15.0g, HMX					0.31 [0.79]	12.18 [30.94]
		EC2-27A1523-RC		15.0g, HNS					0.25 [0.64]	9.90 [25.15]
	2715 Razor XDP	EC2-27A1521		15.0g, RDX					0.26 [0.66]	13.50 [34.29]
		EC2-27A1522		15.0g, HMX			0.34 [0.86]	42.46 [107.85]	0.30 [0.76]	13.13 [33.35]
		EC2-27A1523		15.0g, HNS					0.31 [0.79]	10.50 [26.67]
	2715 Basix XDP	EC2-27A1521-E		15.0g, RDX					0.32 (0.81)	9.40 [23.88]
		EC2-27A1522-E		15.0g, HMX						
2-7/8" 18g	2818 Connex SDP	EC2-28A1821-RC	Fluid	18.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.42 [1.07]	13.00 [33.02]
		EC2-28A1822-RC		18.0g, HMX					0.40 [1.02]	14.02 [35.61]
		EC2-28A1823-RC		18.0g, HNS					0.33 [0.84]	10.55 [26.80]
	2818 Razor XDP	EC2-28A1821		18.0g, RDX			0.43 [1.09]	40.05 [101.73]	0.41 [1.04]	14.10 [35.81]
		EC2-28A1822		18.0g, HMX			0.43 [1.09]	40.05 [101.73]	0.37 [0.94]	15.33 [38.94]
		EC2-28A1823		18.0g, HNS			0.32 [0.81]	32.38 [82.25]	0.33 [0.84]	10.95 [27.81]
	2818 Basix XDP	EC2-28A1821-E		18.0g, RDX					0.47 [1.19]	10.70 [27.18]
		EC2-28A1822-E		18.0g, HMX						

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

- Connex® delivers clean, open tunnels independent of rock type. Every tunnel receives its own cleaning action, independent of other perforations, resulting in a much greater percentage of clean tunnels and ideal flow path between undamaged reservoir and the wellbore. Connex charges create a secondary reaction to clear out the compaction zone in a perforating zone. Patented charge liner material deposited along the tunnel reacts exothermically when introduced to heat and pressure. This creates significant pressure within and around the tunnel, breaking up and expelling the crushed zone compacted debris back into the well bore. In sufficiently competent rock, fractures are also formed at the tunnel tip.
- Razor® delivers industry-leading shaped charge performance, achieved by combining cutting-edge designs, state-of-the-art production processes, and rigorous quality control. When it is critical that your perforation tunnel escapes near-wellbore damage and contacts the formation, Razor XDP's best-in-class penetration pushes your perforations to new depths.
- Basix™ delivers impressive quality at an equally impressive price point. High-performing and budget-conscious Basix takes conventional shaped charge technology and kicks it up a notch. Basix charges are available for good hole, big hole, super big hole, and deep-penetration perforating applications.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 3-1/8" GUN SYSTEMS

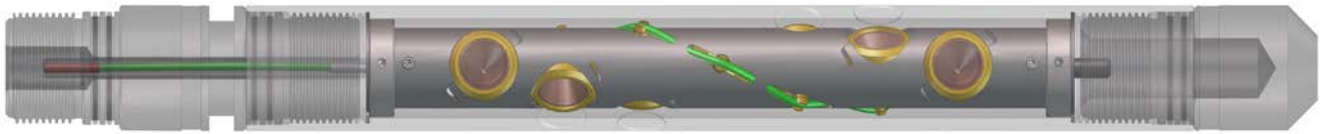
Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 19g	3319 Connex RX	EC2-33A1991-RX	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921	‡ Fluid or Dry	19.0g, RDX			0.51 [1.30]	42.10 [106.93]		
		EC2-33A1922		19.0g, HMX			0.49 [1.24]	41.10 [104.39]	0.43 [1.09]	14.60 [37.08]
	3319 Basix XDP	EC2-33A1921-E	‡ Fluid or Dry	19.0g, RDX			0.43 [1.09]	35.80 [90.93]		
		EC2-33A1922-E		19.0g, HMX						
	3319 Basix XDP	EC2-33A1921-EG	Fluid	19.0g, RDX			0.43 [1.09]	35.70 [90.68]		
	3319 Basix DP	EC2-33A1951	‡ Fluid or Dry	19.0g, RDX			0.54 [1.37]	29.20 [74.17]		
		EC2-33A1952		19.0g, HMX						
3-1/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.42 [1.07]	39.02 [99.11]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS			0.35 [0.89]	26.05 [66.17]	0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E		22.7g, RDX			0.42 [1.07]	46.00 [116.84]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.43 [1.09]	46.37 [117.78]		
	3323 Basix GH	EC2-33A2321-EG		22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX			0.43 [1.09]	45.70 [116.08]	0.40 [1.02]	11.90 [30.23]

‡ *For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 3-3/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-3/8" 19g	3319 Connex RX	EC2-33A1991-RX	In Fluid or Dry	19.0g, RDX	6 spf / 60°	5-1/2"			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921		19.0g, RDX		4-1/2" 11.6# L-80	0.51 [1.30]	42.07 [106.86]		
		EC2-33A1922		19.0g, HMX					0.43 [1.09]	14.60 [37.08]
3-3/8" 23g	3323 Connex SDP	EC2-33A2321-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.45 [1.14]	46.32 [117.65]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS					0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E	In Fluid or Dry	22.7g, RDX			0.45 [1.14]	46.32 [117.65]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.44 [1.12]	46.90 [119.13]		
	3323 Basix GH	EC2-33A2321-EG	Fluid	22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX					0.40 [1.02]	11.90 [30.23]
	3323 Basix DP	EC2-33A2351	In Fluid or Dry	22.7g, RDX			0.47 [1.19]	32.10 [81.53]		
		EC2-33A2352		22.7g, HMX						
3-3/8" 25g	3325 Connex SDP	EC2-33B2521-RC	Fluid	25.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.10 [38.35]
		EC2-33B2522-RC		25.0g, HMX					0.48 [1.22]	15.45 [39.24]
		EC2-33B2523-RC		25.0g, HNS					0.35 [0.89]	12.30 [31.24]
	3325 Razor XDP	EC2-33B2521		25.0g, RDX			0.45 [1.14]	44.58 [113.23]	0.39 [0.99]	17.10 [43.43]
		EC2-33B2522		25.0g, HMX			0.53 [1.35]	47.30 [120.14]	0.50 [1.27]	16.27 [41.33]
		EC2-33B2523		25.0g, HNS			0.37 [0.94]	30.20 [76.71]	0.36 [0.91]	13.20 [33.53]
	3325 Basix XDP	EC2-33B2521-E		25.0g, RDX			0.45 [1.14]	50.10 [127.25]	0.40 [1.02]	12.30 [31.24]
		EC2-33B2522-E		25.0g, HMX			0.47 [1.19]	47.42 [120.45]		



Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 4" - 4-1/2" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4" 23g	3323 Connex SDP	EC2-33A2322-RC	Fluid	22.7g, HMX	6 spf / 60°	5-1/2" 17.0# L-80			0.46 [1.17]	15.31 [38.89]
4" 25g	3325 Razor XDP	EC2-33B2521	In Fluid or Dry	25.0g, RDX						
		EC2-33B2522		25.0g, HMX			0.47 [1.19]	46.11 [117.12]		
	3325 Basix XDP	EC2-33B2521-E	Fluid	25.0g, RDX					0.44 [1.18]	12.50 [31.75]
		EC2-33B2522-E		25.0g, HMX					0.44 [1.18]	12.70 [32.26]
4" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	4 spf / 60°	5-1/2" 17.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX	4 spf / 60°		0.39 [0.99]	53.00 [134.62]	0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX	4 spf / 90°		0.39 [0.99]	53.00 [134.62]	0.37 [0.94]	19.10 [48.51]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX	4 spf / 60°		0.45 [1.14]	51.50 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX					0.44 [1.12]	16.30 [41.40]
4-1/2" 23g	3323 Connex SDP	EC2-33A2321-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	7.0"			0.34 [0.86]	14.75 [37.47]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	10.50 [26.67]
	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	12 spf / 135°-45°	7.0" 32.0# L-80				
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.43 [1.09]	15.70 [39.88]
		EC2-33A2322		22.7g, HMX			0.38 [0.97]	34.90 [88.65]		
4-1/2" 25g	3325 Razor XDP	EC2-33B2521	In Fluid or Dry	25.0g, RDX	6 spf / 60°	7.0"			0.44 [1.12]	16.30 [41.40]
		EC2-33B2522		25.0g, HMX					0.34 [0.86]	15.70 [39.88]
4-1/2" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX			0.44 [1.12]	58.59 [148.82]	0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX			0.45 [1.14]	72.93 [185.24]	0.37 [0.94]	19.10 [48.51]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX			0.45 [1.14]	51.50 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX			0.44 [1.12]	51.97 [132.00]	0.44 [1.12]	16.30 [41.40]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

CONVENTIONAL/UNCONVENTIONAL DP/XDP, 4-5/8" - 7" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-5/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	12 spf / 135°-45°	7.0" 32.0# L-80				
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX						
		EC2-33A2322		22.7g, HMX			0.37 [0.94]	35.03 [88.98]		
4-5/8" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX					0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX					0.37 [0.94]	19.10 [48.51]
		EC2-40A3923		39.0g, HNS					0.33 [0.84]	16.40 [41.66]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX			0.45 [1.14]	51.50 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX					0.44 [1.12]	16.30 [41.40]
5-1/8" 19g	3319 Basix DP	EC2-33A1921-EG	Fluid	† 19.0g, RDX	22 spf / 140°-20°	7-5/8" 33.7# L-80	0.36 [0.91]	26.30 [66.80]		
5-1/8" 23g	3323 Razor XDP	EC2-33A2321	Fluid	† 22.7g, RDX	12 spf / 135°-45°	7-5/8"				
		EC2-33A2322		† 22.7g, HMX					0.38 [0.97]	12.60 [32.00]
	3323 Basix XDP	EC2-33A2321-E	Fluid	† 22.7g, RDX	12 spf / 135°-45°	7-5/8" 33.7# L-80	0.38 [0.97]	28.10 [71.37]		
		EC2-33A2322-E		† 22.7g, HMX						
7" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	12 spf / 135°-45°	9-5/8" 47.0# L-80			0.46 [1.17]	16.50 [41.91]
		EC2-40A3922-RC		39.0g, HMX					0.42 [1.07]	17.50 [44.45]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX					0.38 [0.97]	16.90 [42.93]
		EC2-40A3922		39.0g, HMX			0.41 [1.04]	53.59 [136.12]	0.44 [1.12]	17.65 [44.83]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX					0.50 [1.27]	15.70 [39.88]
		EC2-40A3922-E		39.0g, HMX						

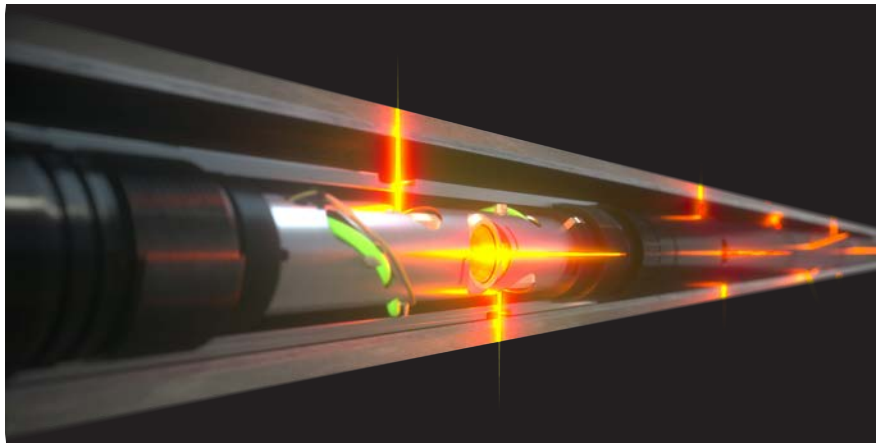
† 33A charge case must be grooved. For 5-1/8" 12 spf, max. explosive load is 22.7g. For 22 spf, max. explosive load is 19g.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Shaped Charges
Constant Entry Hole (CEH) and Penetration, Spiral Phasing

GEODynamics delivers several Limited Entry Perforating System options for unconventional reservoirs.

- FracIQ® provides constant casing hole sizes, regardless of decentralized position, casing size, weight, and grade, for optimal pressure drop during Frac. With a constant entry hole and penetration, each cluster can be treated more efficiently. Subsequent stages and wells can then be further optimized for limited entry fracture stimulation. FracIQ provides superior perforation efficiency during fracture stimulation when compared to conventional perforators which traditionally exhibit a higher entry hole diameter variance across shot phasings.
- FracIQ® Connex® combines FracIQ performance with Connex® Clean Perforation Technology, which delivers clear, open tunnels independent of rock type.
- Basix™ Frac delivers cost-effective constant entry hole and limited penetration to improve the productivity of your well and reduce your completion costs.



CONVENTIONAL/UNCONVENTIONAL CONSTANT ENTRY HOLE, 2-3/4" - 2-7/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD^ *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
2-3/4" 11g-15g	FracIQ 30	EC2-27A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD, P110	0.30 [0.76]	13.0 [33.02]	0.30 [0.76]	2.7 %	5.0 [12.70]
	FracIQ 35	EC2-27A1271		12.0g, RDX			0.35 [0.89]		0.35 [0.89]	5.9 %	
	FracIQ 40	EC2-27A1571		15.0g, RDX			0.40 [1.02]		0.40 [1.02]	6.3 %	
2-7/8" 11g-16g	FracIQ 35	EC2-28A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD, P110	0.36 [0.91]	13.0 [33.02]	0.36 [0.91]	3.3 %	5.0 [12.70]
		EC2-28A1172		11.0g, HMX			0.36 [0.91]		0.36 [0.91]	2.1 %	
	FracIQ 40	EC2-28A1671		16.0g, RDX			0.40 [1.02]		0.40 [1.02]	2.7 %	
		EC2-28A1672		16.0g, HMX			0.40 [1.02]		0.40 [1.02]	2.7 %	

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:32 PM

CONVENTIONAL/UNCONVENTIONAL CONSTANT ENTRY HOLE, 3-1/8" - 3-3/8" GUN SYSTEMS

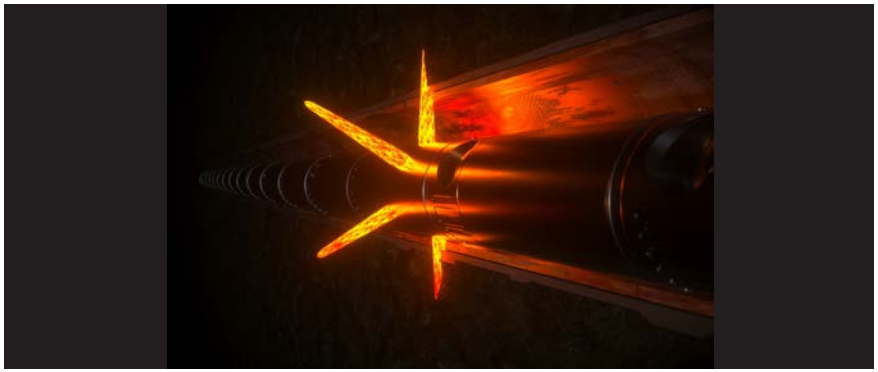
Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110			0.22 [0.56]	5.5%	5.0 [12.70]
	Basix Frac 25	EC2-33A1271-BF		12.0g, RDX			0.26 [0.66]	12.0 [30.48]	0.26 [0.66]	2.4 %	4.0 [10.16]
	FracIQ 25	EC2-33A1371		13.0g, RDX			0.26 [0.66]	13.0 [33.02]	0.26 [0.66]	4.1 %	5.0 [12.70]
3-1/8" 13g-16g	FracIQ Connex 30 †	EC2-33A1471-FRX	Fluid	14.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110			0.31 [0.79]	6.0 %	
	Basix Frac 30	EC2-33A1471-BF		14.0g, RDX			0.31 [0.79]	12.0 [30.48]	0.31 [0.79]	4.0 %	4.0 [10.16]
	FracIQ 30	EC2-33A1671		16.0g, RDX			0.31 [0.79]	13.0 [33.02]	0.31 [0.79]	3.1 %	5.0 [12.70]
	FracIQ 30	EC2-33A1672		16.0g, HMX			0.34 [0.86]		0.34 [0.86]	3.8 %	
3-1/8" 16g-20g	FracIQ Connex 35 †	EC2-33A1671-FRX	Fluid	16.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110			0.36 [0.91]	5.0 %	
	Basix Frac 35	EC2-33A1871-BF		18.0g, RDX			0.36 [0.91]	12.0 [30.48]	0.36 [0.91]	3.4 %	4.0 [10.16]
	FracIQ 35	EC2-33A2071		20.0g, RDX			0.36 [0.91]	13.0 [33.02]	0.36 [0.91]	2.5 %	5.0 [12.70]
	FracIQ 35	EC2-33A2072		20.0g, HMX			0.37 [0.94]		0.37 [0.94]	3.0 %	
3-1/8" 19g-23g	FracIQ Connex 40 †	EC2-33A1971-FRX	Fluid	19.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110			0.41 [1.04]	6.5 %	5.0 [12.70]
	FracIQ 40	EC2-33A2371		23.0g, RDX			0.40 [1.02]	13.0 [33.02]	0.40 [1.02]	3.3 %	
	FracIQ 40	EC2-33A2372		23.0g, HMX			0.41 [1.04]		0.41 [1.04]	3.8 %	
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX			0.40 [1.02]	12.0 [30.48]	0.40 [1.02]	6.6 %	4.0 [10.16]
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX		6.0" OD, P110	0.40 [1.02]		0.40 [1.02]	7.5 %	
	Basix Frac 40	EC2-33A2372-BF		23.0g, HMX		4.5"-5.5" OD, P110					
3-1/8" 20g-23g	FracIQ 45	EC2-33A2071-45	Fluid	20.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110	0.45 [1.14]	13.0 [33.02]	0.45 [1.14]	5.6 %	5.0 [12.70]
	FracIQ Connex 45 †	EC2-33A2371-FRX		21.0g, RDX					0.45 [1.14]	3.2 %	
	Basix Frac 45	EC2-33A2371-BF45		23.0g, RDX			0.45 [1.14]	12.0 [30.48]	0.45 [1.14]	5.9 %	4.0 [10.16]
3-1/8" 23g	FracIQ 50	EC2-33A2371-50 †† EC2-33A2371-50G	Fluid	23.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110	0.50 [1.27]	13.0 [33.02]	0.50 [1.27]	1.5 %	5.0 [12.70]
	FracIQ 50	EC2-33A2372-RX		23.0g, HMX		5.5" OD, P110	0.50 [1.27]		0.50 [1.27]	4.6 %	
	Basix Frac 50	EC2-33A2371-BF50		23.0g, RDX		4.5"-5.5" OD, P110	0.50 [1.27]	12.0 [30.48]	0.50 [1.27]	4.8 %	4.0 [10.16]
	FracIQ 55	EC2-33A2371-55		23.0g, RDX		4.5" OD, P110	0.55 [1.40]	13.0 [33.02]	0.55 [1.40]	3.8 %	
3-3/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4.5"-5.5" OD, P110	0.22 [0.56]	13.0 [33.02]	0.22 [0.56]	5.5%	5.0 [12.70]
	FracIQ 25	EC2-33A1371		13.0g, RDX		6.0" OD, P110	0.26 [0.66]		0.26 [0.66]	2.3 %	

†FracIQ® Connex® charges (part numbers ending with -FRX) designate charges that combine FracIQ technology with Connex Clean Perforation Technology to achieve a constant hole size and tunnel cleaning action in one shaped charge. ††EC2-33A2371-50G has a custom, externally-grooved case (special application).
**3-1/8" FracIQ charge performance is compatible in 4.5" 11.6-15.1# and 5.5" 17-23# P-110 casing.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

HELLFire® allows more effective multi-stage plug-and-perf operations. HELLFire's three- or six-shot cluster options unlock stage completions not possible with lengthy conventional spiral-phased technology.

The short-bodied HELLFire system minimizes wireline tool string length and delivers more clusters per stage. HELLFire's flexible design options allow engineers to specify ideal cluster count and spacing, resulting in lower costs, fewer stages, maximized injectivity, and optimal proppant placement, all with less equipment and a smaller crane.



UNCONVENTIONAL CLUSTER/PLANAR, 3-1/8" - 4" HELLFire® GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe	Performance in Stressed Berea		
							EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" External Scallops 6g-7g	HELLFire 26	EC2-31K0671-26	Fluid	6.0g, RDX	1 to 6 shots per cluster	4-1/2" OD, P110	0.26 [0.66]	7.4 %	3.2 [8.13]
	HELLFire 28	EC2-31K0671-28		6.0g, RDX			0.28 [0.71]	5.5 %	
	HELLFire 33	EC2-31K0771-33		7.0g, RDX			0.33 [0.84]	2.9 %	
	HELLFire 36	EC2-31K0771-36		7.0g, RDX			0.36 [0.91]	1.6 %	
	HELLFire 42	EC2-31K0771-42		7.0g, RDX			0.42 [1.07]	3.8 %	
3-3/8" Internal Scallops 5g-7g	HELLFire 25	EC2-33K0571	Fluid	5.0g, RDX	1 to 6 shots per cluster	5-1/2" - 6.0" OD, P110	0.25 [0.64]	4.3 %	3.5 [8.89]
	HELLFire 30	EC2-33K0771		7.0g, RDX			0.30 [0.76]	2.7 %	
	HELLFire 36	EC2-33K0771-RX		7.0g, RDX			0.36 [0.91]	4.6 %	
3-3/8" External Scallops 6g-7g	HELLFire 25	EC2-33K0671-25	Fluid	6.0g, RDX	1 to 6 shots per cluster	5-1/2" OD, 23# P110	0.25 [0.64]	3.9%	3.5 [8.89]
	HELLFire 30	EC2-33K0771-30		7.0g, RDX			0.30 [0.76]	5.5%	
	HELLFire 33	EC2-33K0771-33		7.0g, RDX			0.33 [0.84]	3.6%	
	HELLFire 34	EC2-33K0771-34		7.0g, RDX			0.34 [0.86]	5.8%	
4" Internal Scallops 12g	HELLFire 40	EC2-40K1271	Fluid	12.0g, RDX	1 to 6 shots per cluster	6.0" OD, 26# P110	0.40 [1.02]	3.9%	3.0 [7.62]

HELLFire 31K and 33K charges are NOT interchangeable. EC2-31K series are for 3-1/8" HELLFire; EC2-33K series are for 3-3/8" HELLFire.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Shaped Charges
Constant Entry Hole (CEH) and Penetration, 45° Tilt Angle

SandIQ® charges provide an "off ramp" for more efficient diversion of proppant. Perforating tunnels are tilted 45 degrees in direction of fluid flow. Angled holes are engineered to create a physical diversion on toe side of casing for proppant to naturally flow into the formation.

SandIQ shaped charges are engineered to produce precision holes in casing size, weights, and grades which are used in unconventional wells.

UNCONVENTIONAL 45° CHARGE TILT ANGLE, 3-1/8" SandIQ® GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Phasing / Charge Tilt Angle	API 19B Targeted Pipe*	Performance in Stressed Berea		
							EHD^ at 45° *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" 13g	SandIQ B	EC2-33A1371-SB	Fluid	13.0g, RDX	60° / 45°	5-1/2" OD, 23# P-110	0.28 [0.71]	4.2 %	5.0 [12.70]
3-1/8" 16g	SandIQ C	EC2-33A1671-SC		16.0g RDX			0.31 [0.79]	3.8 %	
	SandIQ D	EC2-33A1671-SD		16.0g, RDX			0.38 [0.97]	2.6 %	
		EC2-33A1672-SD		16.0g, HMX			0.35 [0.89]	1.7 %	
3-1/8" 20g	SandIQ E	EC2-33A2071-SE		20.0g, RDX			0.42 [1.07]	3.7 %	
		EC2-33A2072-SE		20.0g, HMX			0.41 [1.04]	4.8 %	
3-1/8" 23g	SandIQ F	EC2-33A2371-SF		23.0g, RDX			0.44 [1.12]	1.0 %	
		EC2-33A2372-SF		23.0g, HMX			0.43 [1.09]	6.0 %	
	SandIQ G	EC2-33A2371-SG		23.0g, RDX			0.51 [1.30]	5.2 %	

**3-1/8" SandIQ charge performance is compatible in 4.5" 11.6-15.1# and 5.5" 17-23# P-110 casing.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:32 PM

Refrax™ shaped charges allow operators to optimize depleted wells while providing constant entry hole size and penetration through two strings of casing. Initially, this technology was developed for clients utilizing expandable liners inside existing casing. Now, the perforating system has been further developed for various refracturing applications with several entry hole diameter (EHD) options.

The system's performance is independent of gun position, casing specifications, or target formation. Perforating performance results in optimal pressure diversion and repeatable breakdown pressures that ultimately correlates to better fracturing treatments, lower costs, and more productive wells.

CONVENTIONAL/UNCONVENTIONAL DUAL CASING, 2-3/8" - 3-1/8" GUN SYSTEMS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing				Outer Casing			
						OD/Wt/ Material	EHD Range *(in)[cm]*	EHD Avg *(in)[cm]*	EHD Variance*	OD/Wt/ Material	EHD Range *(in)[cm]*	EHD Avg *(in)[cm]*	EHD Variance*
2-3/8" 11g	2311 Refrax	EC2-23A1171-R	Fluid	11.0g, RDX	6 spf / 60°	3.5" P110	0.33-0.38 [0.84-0.95]			4-1/2" P110	0.33-0.35 [0.84-0.89]		
2-1/2" 11.0g	2511 Refrax	EC2-25A1171-R	Fluid	11.0g, RDX	6 spf / 60°	3-1/2" 9.2# P110	0.39-0.41 [0.99-1.04]	0.40 [1.02]	2.23 %	4-1/2" 13.5# P110	0.43-0.49 [1.09-1.24]	0.46 [1.17]	5.68 %
						4" 9.5# P110	0.37-0.45 [0.94-1.14]	0.40 [1.02]	8.25 %	5-1/2" 23# P110	0.38-0.48 [0.97-1.22]	0.43 [1.09]	8.26 %
	2511 Connex	EC2-25A1121-RC	Fluid	11.0g, RDX		3-1/2" 9.2# P110	0.34-0.40 [0.86-1.02]	0.36 [0.91]	4.69 %	4-1/2" 13.5# P110	0.28-0.33 [0.71-0.84]	0.31 [0.79]	6.53 %
	2511 Basix	EC2-25A1121-E	Fluid	11.0g, RDX		3-1/2" 9.2# P110	0.37-0.41 [0.94-1.04]	0.39 [0.99]	3.47 %	4-1/2" 13.5# P110	0.32-0.37 [0.81-0.94]	0.33 [0.84]	5.49 %
2-3/4" 11g-15g	2711 Refrax	EC2-27A1171-R	Fluid	11.0g, RDX	6 spf / 60°	4.0" P110	0.29-0.30 [0.74-0.76]			5-1/2" P110	0.37-0.41 [0.94-1.04]		
	2715 Refrax	EC2-27A1571-R		15.0g, RDX			0.34-0.36 [0.86-0.91]				0.34-0.42 [0.86-1.07]		
3-1/8" 14g-23g	3314 Refrax	EC2-33A1471-D	Fluid	14.0g, RDX	6 spf / 60°	Expanded 4.0" P110	0.33-0.33 [0.84-0.84]			5-1/2" P110	0.30-0.30 [0.76-0.76]		
	3316 Refrax	EC2-33A1671-D		16.0g, RDX			0.37-0.38 [0.94-0.95]				0.35-0.35 [0.89-0.89]		
	3320 Refrax	EC2-33A2071-D		20.0g, RDX			0.41-0.42 [1.04-1.07]				0.40-0.40 [1.02-1.02]		
	3316 Refrax	EC2-33A1671-D		16.0g, RDX	6 spf / 60°	4-1/2" P110	0.30-0.32 [0.76-0.81]			7.0" P110	0.39-0.41 [0.99-1.04]		
	3323 Refrax	EC2-33A2371-D		23.0g, RDX			0.41-0.42 [1.04-1.07]				0.35-0.35 [0.89-0.89]		

**EHD variation decentralized.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

GEOPunch™ minimizes or eliminates perforation damage by optimizing the well's dynamic underbalance, which is the transient underbalance that occurs just after creation of the perforation cavity.

Proprietary design software specifies a custom perforating configuration and the optimal completion process. This approach generates and controls the dynamic underbalance, rather than relying on the estimated reservoir pressure to create underbalance.

GEOPunch perforating is successfully performed in hard- and soft-rock formations, oil and gas reservoirs, and sandstones and carbonates and it also minimizes disruption of the cement/sandface hydraulic bond.

CONVENTIONAL/UNCONVENTIONAL DYNAMIC UNDERBALANCE PUNCHERS, 1-9/16" - 7" GUN SYSTEMS

Circulating Charges (Tubing Punchers)		Explosive *(g), load*	Tubing/Drill Pipe Wall Thickness *(in)[cm]*	Entrance Hole *(in)[cm]*	Penetration *(in)[cm]*
Carrier O.D.	Part Number				
1-9/16"	TG39CS2	2.7g, HMX	0.190 [0.4826]	0.45 [1.1430]	<=0.100 [0.254]
			0.375 [0.9525]	0.31 [0.7874]	
	TG39CM2	3.4g, HMX	0.375 [0.9525]	0.43 [1.0922]	<=0.100 [0.254]
			0.500 [1.2700]	0.24 [0.6096]	
	TG39CL2	3.4g, HMX	0.500 [1.2700]	0.21 [0.5334]	<=0.100 [0.254]
			0.580 [1.4732]	0.18 [0.4572]	
	TG39CM2-78	3.4g, HMX	0.625 [1.5875]	0.28 [0.7112]	<=0.100 [0.254]
			0.785 [1.9939]	0.17 [0.4318]	
	TG39CL2-88	3.4g, HMX	0.750 [1.9050]	0.20 [0.5080]	<=0.100 [0.254]
			0.885 [2.2479]	0.17 [0.4318]	

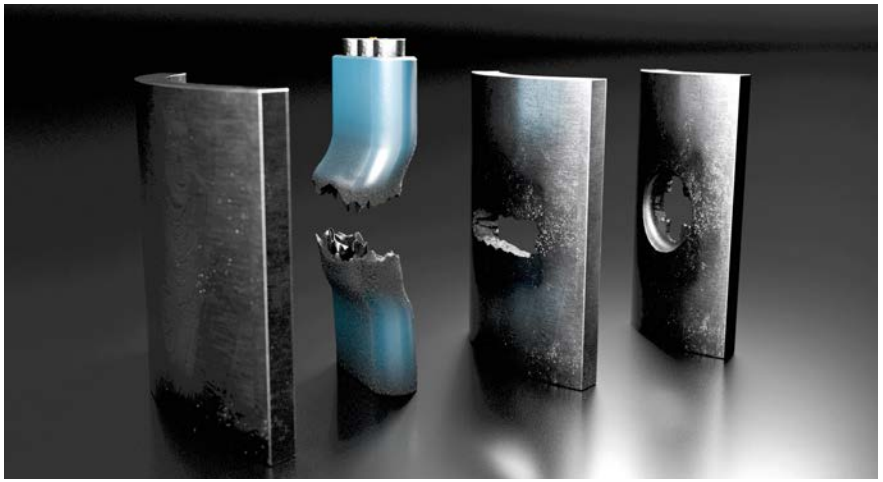
Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
2-3/4", 2-7/8"	2708 GEOPunch RDX	EC2-27A0861	8.0g, RDX	1.05 [2.67]
	2708 GEOPunch HMX	EC2-27A0862	8.0g, HMX	
	2708 GEOPunch HNS	EC2-27A0863	8.0g, HNS	
2-7/8"	2808 GEOPunch RDX	EC2-28A0861	8.0g, RDX	1.05 [2.67]
	2808 GEOPunch HMX	EC2-28A0862	8.0g, HMX	
	2808 GEOPunch HNS	EC2-28A0863	8.0g, HNS	
3-1/8", 3-3/8"	3308 GEOPunch RDX	EC2-33A0861	8.0g, RDX	1.05 [2.67]
	3308 GEOPunch HMX	EC2-33A0862	8.0g, HMX	
	3308 GEOPunch HNS	EC2-33A0863	8.0g, HNS	
4", 4-1/2", 7"	4008 GEOPunch RDX	EC2-40A0861	8.0g, RDX	1.05 [2.67]
	4008 GEOPunch HMX	EC2-40A0862	8.0g, HMX	
	4008 GEOPunch HNS	EC2-40A0863	8.0g, HNS	

Shaped Charges
Flat Pack Ablation (FPA) for Perf, Wash, Cement (PWC)

SaberJet™ efficiently severs flat pack control lines across large (0.75”) water gaps and in various casing sizes, enabling a streamlined, cost-effective perf, wash, and cement (PWC) operation in a single trip. This advanced solution eliminates the need for control line terminations, pipe cutting, as well as recovery of the completion tubing string.

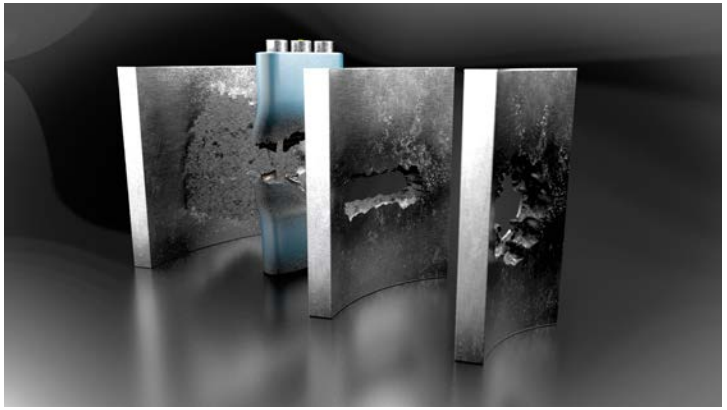
By reducing time and costs associated with tubing recovery and transportation back to shore, SaberJet also eliminates the high expenses of handling LSA-contaminated tubing, minimizing risk, and enhancing efficiency in plug and abandon (P&A) applications.

For operations that require retrieval of the completion tubing string, the SaberJet system can also be utilized to sever flat pack control lines, standard control lines, or fiber optics. This prevents costly and time-consuming fishing operations that may be required if the lines break at an unintended depth during tubing retrieval.



FLAT PACK ABLATION CHARGE PERFORMANCE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing Tested	Casing Tested	Water Gap *(in)[cm]*	Casing Cut Length *(in)[cm]*	Max. Casing Cut Width *(in)[cm]*
3-1/8”	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX	5.14 spf / 0°-180° *(5° slow rotation every two charges)*	5-1/2” 17# L-80	1.0 [2.54]	1.37 [3.48] *avg.*	0.21 [0.53] *avg.*
						5-1/2” 23# Chrome	0.75 [1.91]	1.34 [3.40] *avg.*	0.18 [0.46] *avg.*
3-3/8”	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX		5-1/2” 23# Chrome		1.30 [3.30] *avg.*	0.20 [0.51] *avg.*
						6-5/8” 28# Chrome		1.55 [3.94] *avg.*	0.21 [0.53] *avg.*
4”	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX		6-5/8” 28# Chrome		1.46 [3.71] *avg.*	0.20 [0.51] *avg.*
		EC2-33A2322-FPA		23.0g, HMX					
		EC2-33A2323-FPA		23.0g, HNS					



Flat Pack Dimensions (pre-test): 1.417” x 0.55”
Tested with 3-1/8” 5.14spf in 5-1/2” 17# L-80 Casing

Revised: August 20, 2025 12:32 PM

DETONATORS

Part Number	Description
DET-E-A105	Detonator, Electric, A105
DET-E-A140	Detonator, Electric, A-140 w/block (219192)
DET-E-A140F	Detonator, Electric, A-140F w/block
DET-E-A140F-SL	Detonator, Electric, A-140F w/ 6.5" leads and block
DET-E-A140S	Detonator, Electric, A-140S Fluid Disabled Resistorized Instantaneous RDX
DET-E-A140S-DM	Detonator, Electric, A-140S Fluid Disabled Resistorized Instantaneous RDX, DM
DET-E-A161	Detonator, Electric, A-161
DET-E-A85	Detonator, Electric, A85
DET-E-A96L	Detonator, Electric, A96L
DET-E-R140	Detonator, Electric, R-140 RDX
DET-E-R140H	Detonator, Electric, R-140H HMX
DET-102350510	Detonator, RED, Top Fire, Electric, 1.02 Grams
DET-102478439	Detonator, TOP FIRE, RED Det. 102350510
DET-2-300770-1	Detonator, TOP FIRE, RF-SAFE GREENDET
DET-3050-008	Detonator, Resistor Bridge Top Fire

Detonator, Electric, A-140S
DET-E-A140S

ACCESSORIES

Part Number	Description
DET-0010-006	Rubber Grommet
DET-0100-018	Detcord Sizing Adapter (40/60 gr round to accept 80 gr detonator/booster; 0.22" O.D. x 0.5" long)
DET-2000-000	Detonator Safety Shield
DET-A161-ADAPTER	Cord Adapter for A161 (40/60gr round to 80gr round)
DET-PE-4070	Crimp Sleeve for A140S Detonator
DT-0875-242	End Seal for 80 Grain Detonating Cord, 0.24" x 0.88"
GN-000-0018	Teflon Grommet
MS-1000-004	Detonating Cord Charge Clip
MS-1000-115	Low Profile Charge Clip
MS-1000-120	Super Big Hole Charge Clip

40/60gr Round to 80gr Round Cord
DET-A161-Adapter

CUTTERS AND CRIMPERS

Part Number	Description
DET-0000-036	Primacord Cutter
DET-0000-050	Scale 12" Detonating Cord Cutter
DET-0000-053	Booster Crimpers
DET-0100-053	Super Crimper Assembly
DET-14882BTS	Dual Cap Crimper
DET-80592	Crimper/Cutter Tool Kit

DETONATING CORDS, SPOOL AND AIR PACK

Load (gr/ft)	Part Number	Description
40	DET-40H212	Detonating Cord, 40 grain HMX LS (Detotec)
	DET-40H512	Detonating Cord, 40 grain HMX LS Ribbon (Detotec)
	DET-40R211	Detonating Cord, 40 grain RDX LS (Detotec)
	DET-40R511	Detonating Cord, 40 grain RDX LS Ribbon (Detotec)
	DET-A538017	Detonating Cord, Fireline 8/40 RDX LS Ribbon 1.4S Airpack
	DET-A545010	Detonating Cord, 40 grain HMX Ribbon
	DET-A545015	Detonating Cord, FireLine 40 gr HMX LS Ribbon, Air Packed, 36 lbs/bx
60	DET-60H212	Detonating Cord, 60 grain HMX LS (Detotec)
	DET-A574010	Detonating Cord, 60 Gr HMX LS
	DET-A574015	Detonating Cord, 60 Gr HMX LS FirePak 1.4D
70	DET-70H212	Detonating Cord, 70 grain HMX LS (Detotec)
80	DET-80H212	Detonating Cord, 80g HMX LS Zytec
	DET-80H212A	Detonating Cord, 80 grain HMX LS Zytel Airpack (Detotec)
	DET-80H312	Detonating Cord, 80 grain HMX XHV (Detotec)
	DET-80H312A	Detonating Cord, 80 grain HMX XHV Airpack (Detotec)
	DET-80I111	Detonating Cord, 80 grain Inert
	DET-80P113	Detonating Cord, 80 grain PETN WP (Detotec)
	DET-80R111	Detonating Cord, 80 grain RDX Nylon (Detotec)
	DET-80R211	Detonating Cord, 80 grain RDX LS (Detotec)
	DET-80R211A	Detonating Cord, 80 grain RDX LS Airpack (Detotec)
	DET-80R311	Detonating Cord, 80 grain RDX LS XHV (Detotec)
	DET-80R311A	Detonating Cord, 80 grain RDX LS XHV Airpack (Detotec)
	DET-A580010	Detonating Cord, Fireline 17/80 RDX Nylon
	DET-A585010	Detonating Cord, Fireline 17/80 HNS LS (EXPOSED) (500'/ CS)
	DET-PT250	Detonating Cord, 80 gr HNS FEP Jacket, (DE P/N 2315353)

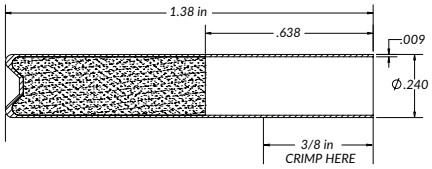
Bi-Directional Boosters
HMX, DT-BIDI-400

GEODynamics' uniquely formed bi-directional boosters take advantage of an E.I. DuPont "taper jet" design which provides a uniform, high-output jet and increases the output of our boosters in excess of four times that which is provided by other boosters on the market. The "taper jet" design provides a benefit on the receiver side of the booster as well by focusing energy from the donor to initiate the receiving booster. This efficient transfer of energy between the two boosters provides a reliable detonation wave required for a dependable transfer.

TECHNICAL INFORMATION

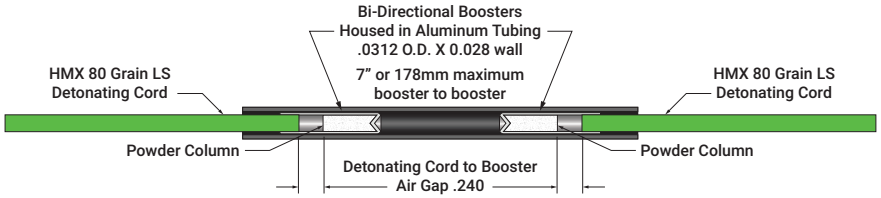
Temperature Resistance		
HMX 10 grains (650 mg)		
Time	**Fahrenheit**	**Celsius**
1 hr	400°F	204°C
24 hr	356°F	180°C
100 hr	300°F	148°C

Dimensions		
Shell Length	1.38 in	3.51 cm
Shell OD	0.24 in	0.61 cm
Shell ID	0.22 in	0.56 cm
Powder Depth (open end)	0.63 in	1.60 cm
Crimp Area (open end)	0.38 in	0.97 cm



QC TEST CONFIGURATION

Our HMX bi-di is designed and tested to shoot over a 7" air gap between the donor and receiving booster, while the detonating cord on each booster has a 0.240" air gap from the powder column. When new powder is received at our facility, Legacy tests the transfer over a 13" air gap before the powder is released into production. This lot-by-lot testing ensures our boosters are superior in transfer reliability over all other bi-directional boosters on the market.



Sensitivity		
Application	**Maximum Distance**	
Booster to Booster	177.80 mm	7.000 in
Detonating Cord to Booster	6.35 mm	0.250 in
Output in Steel Plate	1.02 mm	0.040 in

Packaging Information		
Quantity (per box)	50 pcs	100 pcs
Gross Weight (per box)	2.0 lb	4.0 lb
	.90 kg	1.81 kg
Net Weight (per box)	.12 lb	.23 lb
	.05 kg	.10 kg
Net Explosive Quantity (NEQ) (per box)	.07 lb	.14 lb
	.03 kg	.06 kg
Box Dimensions	12 w x 12 l x 7.5 h (in.)	
	30.5 w x 30.5 l x 17.8 h (cm.)	
Product Weight	16.8 grains	
	1.1 gram	
U.N. Proper Shipping Name	Components, explosive train, n.o.s. (HMX)	
U. N. Number	UN0384	
DOT Approval Number	EX2008080032	
U.N. Classification Code	1.4S	
CE Mark (EU and UK)	CE0163, LOM 22EXP9148	

USAGE, STORAGE, AND DISPOSAL

WARNING

Use of explosives by untrained personnel is extremely dangerous and may injure or kill.

SHELF LIFE

- 10 YEARS STORED UNOPENED IN ORIGINAL PACKAGING
- TEMPERATURE RANGE: +41°F to +95°F (+5°C to +35°C)
- RELATIVE HUMIDITY: MAX. 65%
- GOOD VENTILATION

DISPOSAL

Boosters should be destroyed only by AUTHORIZED persons
(COMPLIANT WITH NATIONAL AND STATE LAW AND REGULATION).
Refer to Section 13 of the product SDS for disposal considerations.

Revised: August 20, 2025 12:34 PM

Bi-Directional Boosters
HNS, DT-BIDI-475

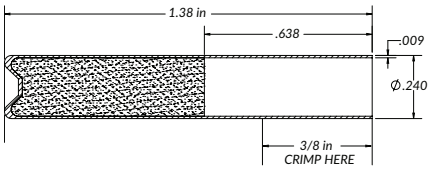
GEODynamics

GEODynamics' uniquely formed bi-directional boosters take advantage of an E.I. DuPont "taper jet" design which provides a uniform, high-output jet and increases the output of our boosters in excess of four times that which is provided by other boosters on the market. The "taper jet" design provides a benefit on the receiver side of the booster as well by focusing energy from the donor to initiate the receiving booster. This efficient transfer of energy between the two boosters provides a reliable detonation wave required for a dependable transfer.

TECHNICAL INFORMATION

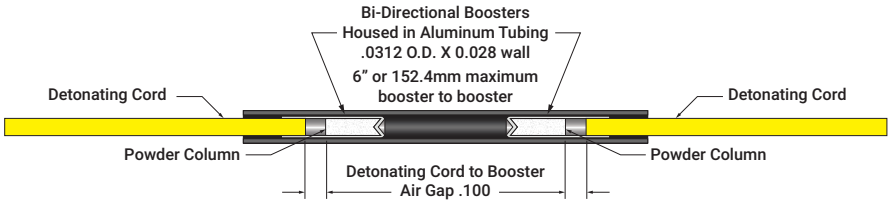
Temperature Resistance		
HNS 10 grains (650 mg)		
Time	**Fahrenheit**	**Celsius**
1 hr	475°F	246.1°C
100 hr	450°F	232.2°C

Dimensions		
Shell Length	1.38 in	3.51 cm
Shell OD	0.24 in	0.61 cm
Shell ID	0.22 in	0.56 cm
Powder Depth (open end)	0.63 in	1.60 cm
Crimp Area (open end)	0.38 in	0.97 cm



QC TEST CONFIGURATION

Our HNS bi-di is designed and tested to shoot over a 6" air gap between the donor and receiving booster, while the detonating cord on each booster has a 0.10" air gap from the powder column. This testing ensures our boosters are superior in transfer reliability over all other bi-directional boosters on the market.



Sensitivity		
Application	**Maximum Distance**	
Booster to Booster	152.40 mm	6.000 in
Detonating Cord to Booster	2.54 mm	0.100 in

Packaging Information		
Quantity (per box)	50 pcs	100 pcs
Gross Weight (per box)	2.0 lb	4.2 lb
	.90 kg	1.9 kg
Net Weight (per box)	.12 lb	.22 lb
	.05 kg	.10 kg
Net Explosive Quantity (NEQ) (per box)	.07 lb	.13 lb
	.03 kg	.06 kg
Box Dimensions	12 w x 12 l x 7.5 h (in.)	
	30.5 w x 30.5 l x 17.8 h (cm.)	
Product Weight	15.4 grains	
	1 gram	
U.N. Proper Shipping Name	Components, explosive train, n.o.s. (HNS)	
U. N. Number	UN0384	
DOT Approval Number	EX2008080032	
U.N. Classification Code	1.4S	

USAGE, STORAGE, AND DISPOSAL

WARNING

Use of explosives by untrained personnel is extremely dangerous and may injure or kill.

SHELF LIFE

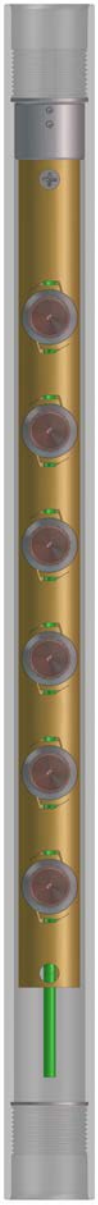
- 10 YEARS STORED UNOPENED IN ORIGINAL PACKAGING
- TEMPERATURE RANGE: +41°F to +95°F (+5°C to +35°C)
- RELATIVE HUMIDITY: MAX. 65%
- GOOD VENTILATION

DISPOSAL

Boosters should be destroyed only by AUTHORIZED persons (COMPLIANT WITH NATIONAL AND STATE LAW AND REGULATION). Refer to Section 13 of the product SDS for disposal considerations.

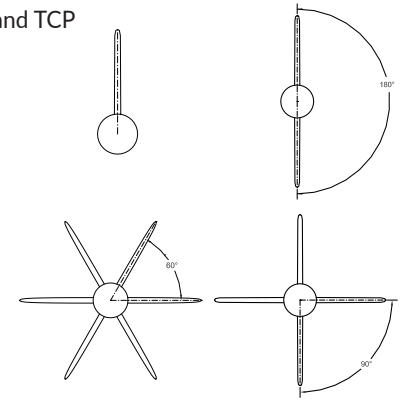
Conventional Long Guns
1-9/16 in (40 mm), RTG, 4 and 6 SPF, DP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	40-grain ribbon
Compatible Perforating Charges	Razor®and Circulating Charges
Maximum Gun Swell (in)[mm]	1.69" [43] @ 3.2g (In Fluid); 1.69" [43] @ 2.9g (Dry)



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	88,100 [392] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA1606-7915A-A***	6 spf [20 spm]	60°	5.50	139.70	2.00	50.80	4.25 lb/ft (w/sub)	3.62 lb/ft (w/sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA1606-7915A-***A084***.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, with 0° (O), 60° (A), or 90° (B) phasing (3" shot spacing)
- 6 spf, up to 120 shots per gun, with 0° (O) phasing (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
Actual Gun Length (ft) [m]	20.75 [6.32]	14.75 [4.50]	10.75 [3.28]	6.75 [2.06]	4.75 [1.45]
4 SPF Total Number of Loadable Shots	080	056	040	024	016
6 SPF Total Number of Loadable Shots	120	084	060	036	024

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
1-9/16" 3.2g	1503 Connex SDP	EC1-15A0321-RC	Fluid	3.2g, RDX	6 spf / 60°	2-7/8" 6.5# L-80			0.17 [0.43]	4.90 [12.45]
		EC1-15A0322-RC		3.2g, HMX					0.17 [0.43]	6.80 [17.27]
	1503 Razor XDP	EC1-15A0321	Fluid	3.2g, RDX	6 spf / 60°		0.17 [0.43]	12.13 [30.81]	0.13 [0.33]	5.30 [13.46]
		EC1-15A0322	In Fluid or Dry	3.2g, HMX	4 spf / 0°		0.19 [0.48]	13.09 [33.25]		
			Fluid		6 spf / 60°		0.19 [0.48]	13.09 [33.25]	0.13 [0.33]	5.23 [13.28]
		EC1-15A0323		3.2g, HNS					0.11 [0.28]	5.00 [12.70]
1-9/16" 2.9g	1503 Razor XDP LS	EC1-15A0321-L	Dry	2.9g, RDX	6 spf / 0°					
		EC1-15A0322-L		2.9g, HMX			0.19 [0.48]	12.80 [32.51]	0.18 [0.46]	6.50 [16.51]

CIRCULATING CHARGES (TUBING PUNCHERS)

Circulating Charges (Tubing Punchers)		Explosive *(g), load*	Tubing/Drill Pipe Wall Thickness *(in)[cm]*	Entrance Hole *(in)[cm]*	Penetration *(in)[cm]*
Carrier O.D.	**Part Number**				
1-9/16"	TG39CS2	2.7g, HMX	0.190 [0.4826]	0.45 [1.1430]	<=0.100 [0.254]
			0.375 [0.9525]	0.31 [0.7874]	
	TG39CM2	3.4g, HMX	0.375 [0.9525]	0.43 [1.0922]	<=0.100 [0.254]
			0.500 [1.2700]	0.24 [0.6096]	
	TG39CL2	3.4g, HMX	0.500 [1.2700]	0.21 [0.5334]	<=0.100 [0.254]
			0.580 [1.4732]	0.18 [0.4572]	
	TG39CM2-78	3.4g, HMX	0.625 [1.5875]	0.28 [0.7112]	<=0.100 [0.254]
			0.785 [1.9939]	0.17 [0.4318]	
	TG39CL2-88	3.4g, HMX	0.750 [1.9050]	0.20 [0.5080]	<=0.100 [0.254]
			0.885 [2.2479]	0.17 [0.4318]	

Contact GEODynamics Engineering for recommendations and phasing options.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	6 SPF
0°	Carrier	C1604-O***	C1606-O***
	Load Tube	T7915A-04-O***	T7915A-06-O***
60°	Carrier	C1604-A***	C1606-A***
	Load Tube	T7915A-04-A***	T7915A-06-A***
90°	Carrier	C1604-B***	
	Load Tube	T7915A-04-B***	
All	Top Endplate	GN-EP16-7900	
	Bottom Endplate	GN-EP16-7915	
	Snap Rings	N5000-125 (QTY 2)	
	TCP Transfer Kits	GN-020-0100, GN-020-0100HT	

*** Total number of shots*

HARDWARE SPECIFICATIONS

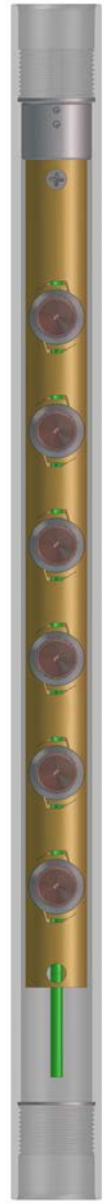
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	1.56 [39.7] / 0.172 [4.37]
Upper/Lower Thread Connections	1-9/32" - 12 Stub ACME

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Top Sub Lift Sub Assembly, 1-9/16" and 2"	TC-QC15-000
Top Subs, 1-9/16"	
Top Sub, TCP	GN-R16-0020
Top Sub, Wireline	GN-R16-0035
Tandem Sub, 1-9/16"	GN-R16-0021
O-Ring Materials and Size, Nitrile (standard option)	OR-N569-215
Viton (with back-up rings required for > 325°F)	OR-V95G-215
Back-up rings for > 325°F	OR-B215-1308
Thread Protectors	
Top Sub (Top Pin)	GN-THD-156-020
Carrier (Gun) Protector	GN-THD-156-000
Tandem Sub & Bull Plug Protector	GN-THD-156-020
Bull Plug, 1-9/16"	GN-R16-0022

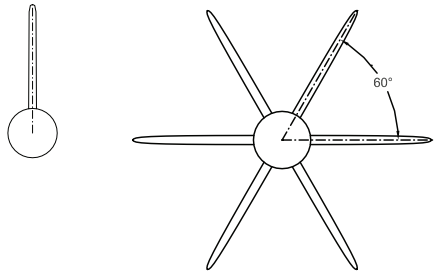
Conventional Long Guns
1-3/4 in (44 mm), RTG, 6 SPF, DP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	40-grain ribbon
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	1.91 [48.51] @ 5.1g (In Fluid)



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	88,100 [392] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA17506-7517A-A***	6 spf [20 spm]	60°	5.50	139.70	2.00	50.80	4.6 lb/ft (with sub)	3.6 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA17506-7517A-**A084**.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 6 spf, up to 120 shots per gun, with 0° (O) phasing (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
Actual Gun Length (ft) [m]	20.75 [6.32]	14.75 [4.50]	10.75 [3.28]	6.75 [2.06]	4.75 [1.45]
6 SPF Total Number of Loadable Shots	120	084	060	036	024

Conventional Long Guns
1-3/4 in (44 mm), RTG, 6 SPF, DP

GEODynamics®

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
1-3/4" 5.1g	1705 Connex SDP	EC1-17A0521-RC	Fluid	5.1g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.21 [0.53]	7.40 [18.80]
		EC1-17A0522-RC		5.1g, HMX					0.21 [0.53]	8.70 [22.10]
	1705 Razor XDP	EC1-17A0521		5.1g, RDX	6 spf / 0°					
		EC1-17A0522		5.1g, HMX			0.26 [0.66]	21.63 [54.94}	0.20 [0.51]	7.70 [19.56]
		EC1-17A0523		5.1g, HNS					0.19 [0.48]	6.20 [15.75]
	1705E Basix XDP	EC1-17A0521-E		5.1g, RDX	6 spf / 60°					
		EC1-17A0522-E		5.1g, HMX						

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	6 SPF
0°	Carrier	C17506-O***
	Load Tube	T7517A-06-O***
60°	Carrier	C17506-A***
	Load Tube	T7517A-06-A***
All	Top Endplate	GN-EP175-7500
	Bottom Endplate	GN-EP17-7515E
	Snap Rings	N5000-125 (QTY 2)
	TCP Transfer Kits	GN-020-0100, GN-020-0100HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	1.765 [44.83] / 0.1875 [4.76]
Upper/Lower Thread Connections	1-7/16" - 12P Stub ACME

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 1-9/16" and 2"	TC-QC15-000	
Top Sub, TCP, 1-3/4" Top Sub, Wireline, 1-3/4" Tandem Sub, 1-3/4"	GN-R175-0020 GN-R175-0035 GN-R175-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-215 OR-V95G-215 OR-B215-1308	Gun Connection OR-N569-218 OR-V95G-218 OR-B217-1468
Thread Protectors Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-156-020 GN-THD-175-000 GN-THD-175-020	
Bull Plug, 1-3/4"	GN-R175-0022	

Revised: August 20, 2025 12:34 PM

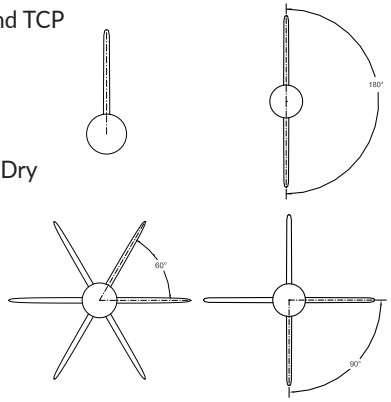
Conventional Long Guns
2 in (51 mm), RTG, 4-6 SPF, GH and DP

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	40-grain ribbon
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	2.29" [58.16] @ 6.5g, (Connex XLS (extra low swell)) In Fluid or Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	153,100 [681] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA2006-7320A-A***	6 spf [20 spm]	60° 60°	5.50	139.70	2.00	50.80	6.1 lb/ft (with sub)	4.9 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA2006-7320A-***A084***.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, with 0° (O), 60° (A), 90° (B), or 180° (J) phasing (3" shot spacing)
- 5 spf, up to 100 shots per gun, with 60° (A) phasing (2.4" shot spacing)
- 6 spf, up to 120 shots per gun, with 0° (O) phasing (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
Actual Gun Length (ft) [m]	20.75 [6.32]	14.75 [4.50]	10.75 [3.28]	6.75 [2.06]	4.75 [1.45]
4 SPF Total Number of Loadable Shots	080	056	040	024	016
5 SPF Total Number of Loadable Shots	100	070	050	030	020
6 SPF Total Number of Loadable Shots	120	084	060	036	024

Conventional Long Guns
2 in (51 mm), RTG, 4-6 SPF, GH and DP

GEODynamics®

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2" 6.8g	2007 Basix GH	EC1-20A0742	In Fluid or Dry	6.8g, HMX	4 spf / 0°	3-1/2" 9.2# L-80	0.36 [0.91]	20.52 [52.12]		

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2" 6.8g	2007 Connex SDP	EC2-20A0721-RC	Fluid	6.8g, RDX	6 spf / 60°	2-7/8"			0.22 [0.56]	8.94 [22.71]
		EC2-20A0722-RC		6.8g, HMX					0.22 [0.56]	9.37 [23.80]
		EC2-20A0723-RC		6.8g, HNS					0.20 [0.51]	7.30 [18.54]
	2007 Razor XDP	EC1-20A0721	Fluid	6.8g, RDX	6 spf / 60°	3-1/2" 9.2# L-80	0.25 [0.64]	21.83 [55.45]	0.22 [0.56]	9.55 [24.26]
		EC1-20A0722		6.8g, HMX			0.24 [0.61]	24.40 [61.98]		
		EC1-20A0722		6.8g, HMX		2-7/8" 6.4# L-80	0.25 [0.64]	22.30 [56.64]		
	2007E Basix XDP	EC1-20A0721-E	Fluid	6.8g, RDX	6 spf / 60°	3-1/2" 9.2# L-80	0.25 [0.64]	16.42 [41.71]		
		EC1-20A0722-E		6.8g, HMX			0.25 [0.64]	20.70 [52.58]	0.24 [0.61]	8.40 [21.34]
2" 6.5g	2007 Connex SDP XLS	EC2-20B0721-RC	In Fluid or Dry	6.5g, RDX	6 spf / 60°	2-7/8" 6.4# L-80			0.23 [0.58]	8.70 [22.10]
		EC2-20B0722-RC		6.5g, HMX					0.21 [0.53]	9.80 [24.89]
	2007 Razor XLS XDP	EC1-20B0721		6.5g, RDX						
		EC1-20B0722		6.5g, HMX			0.25 [0.64]	22.30 [56.64]	0.19 [0.48]	10.80 [27.43]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	5 SPF	6 SPF
0°	Carrier	C2004-O***		C2006-O***
	Load Tube	T7320A-04-O*** T7320A-04-O***H		T7320A-06-O*** T7320A-06-O***H
60°	Carrier	C2004-A***	C2005-A***	C2006-A***
	Load Tube	T7320A-04-A*** T7320A-04-A***H	T7320A-05-A***	T7320A-06-A*** T7320A-06-A***H
90°	Carrier	C2004-B***		
	Load Tube	T7320A-04-B***		
180°	Carrier		C2005-J***	
	Load Tube		T7320A-05-J***	
All	Top Endplate	GN-EP20-7300 (gun lengths 2' - 11') GN-EP20-7300H (gun lengths 15' - 21')		
	Bottom Endplate	GN-EP20-7315E (gun lengths 2' - 11') GN-EP20-7315H or -7375EH (gun lengths 15' - 21')		
	Snap Rings	N5000-162 (QTY 2)		
	TCP Transfer Kits	GN-020-0100, GN-020-0100HT		

**** Total number of shots. Load tube PNs ***H are for 15' - 21' gun lengths.*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	2.03" [52] / 0.210 [5.33]
Upper/Lower Thread Connections	1-11/16" - 8P Stub ACME

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 1-9/16" and 2"	TC-QC15-000	
Top Subs, 2"		
Top Sub, TCP	GN-R20-0020	
Top Sub, Wireline	GN-R20-0035	
Tandem Subs, 2"		
Tandem Sub, TCP	GN-R20-0021	
Switch Tandem Sub, Wireline	GN-R20-T100-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-215	OR-N569-221
Viton (with back-up rings required for > 325°F)	OR-V95G-215	OR-V95G-221
Back-up rings for > 325°F	OR-B215-1308	OR-B221-1715
Thread Protectors		
Top Sub (Top Pin)	GN-THD-156-020	
Carrier (Gun) Protector	GN-THD-200-000	
Tandem Sub & Bull Plug Protector	GN-THD-200-020	
Bull Plug, 2"	GN-R20-0022	
Det Cord Clip	MS-1000-004	
Low Profile Clip	MS-1000-115	


GN-R20-0020


GN-R20-0035


GN-R20-0021


GN-R20-T100-A

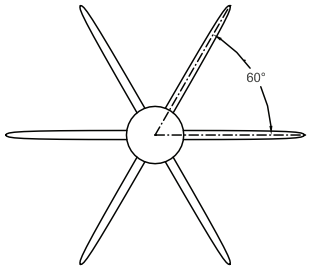

GN-R20-0022

Conventional Long Guns
2-3/8 in (60 mm), RTG, 5 and 6 SPF, XDP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	60-grain cord; DET-60H212
Compatible Perforating Charges	Connex®, Razor®, Basix™, Refrax™
Maximum Gun Swell (in)[mm]	2.56" [6.50] @ 11.0g (In Fluid); 2.62" [66.55] @ 10.5g (Dry)



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	153,100 [681] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA2305-6823A-A***	5 spf [16 spm]	60°	7.20	182.88	2.40	60.96		
GA2306-6823A-A***	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	9.5 lb/ft (with sub)	7.5 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA2306-6823A-***A084***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	5'
Actual Gun Length (ft) [m]	20.75 [6.32]	14.75 [4.50]	10.75 [3.28]	6.75 [2.06]	4.75 [1.45]
5 SPF Total Number of Loadable Shots	100	070	050	030	020
6 SPF Total Number of Loadable Shots	120	084	060	036	024

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2-3/8" 11g	2311 Connex SDP	EC2-23A1121-RC	Fluid	11.0g, RDX	6 spf /60°	3-1/2" 9.2# L-80			0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC		11.0g, HMX					0.31 [0.79]	11.35 [28.83]
		EC2-23A1123-RC		11.0g, HNS					0.23 [0.58]	8.70 [22.10]
	2311 Razor XDP	EC2-23A1121		11.0g, RDX					0.25 [0.64]	12.70 [32.26]
		EC2-23A1122		11.0g, HMX			0.31 [0.79]	30.11 [76.48]	0.24 [0.61]	11.40 [28.96]
		EC2-23A1123		11.0g, HNS			0.25 [0.64]	22.70 [57.68]	0.23 [0.58]	9.20 [23.37]
	2311 Basix XDP	EC2-23A1121-E		11.0g, RDX					0.30 [0.76]	9.00 [22.86]
		EC2-23A1122-E		11.0g, HMX						
2-3/8" 10.5g	2311 Razor XDP LS	EC2-23A1121-LS	Dry	10.5g, RDX	‡ 5 spf / 0°	3-1/2" 9.2# L-80				
		EC2-23A1122-LS		10.5g, HMX			0.31 [0.79]	30.11 [76.48]		
		EC2-23A1121-LS	Fluid	10.5g, RDX	6 spf / 0°					
		EC2-23A1122-LS		10.5g, HMX			0.31 [0.79]	30.11 [76.48]		
2-3/8" 10.5g	2311 Connex SDP XLS	EC2-23A1121-RC-LS	Dry	10.5g, RDX	‡ 5 spf / 60°	3-1/2"			0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC-LS		10.5g, HMX					0.31 [0.79]	11.35 [28.83]
		EC2-23A1121-RC-LS	Fluid	10.5g, RDX	6 spf / 60°				0.25 [0.64]	11.40 [28.96]
		EC2-23A1122-RC-LS		10.5g, HMX					0.31 [0.79]	11.35 [28.83]

‡ *For 2-3/8" in dry gas, maximum shot density is 5 spf and limited to low-swell (LS) charges only.*

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing	
						O.D./Material	**EHD** *(in)[cm]*	**O.D./Material**	**EHD** *(in)[cm]*
2-3/8"	2311 Refrax	EC2-23A1171-R	Fluid	11.0g, RDX	6 spf / 60°	3-1/2" P110	0.33-0.38 [0.84-0.95]	4-1/2" P110	0.33-0.35 [0.84-0.89]

2-3/8" - DRY GAS CONDITIONS

For 2-3/8" perforating in **dry gas:**

- Maximum shot density is **5 spf.**
- **Low-swell (LS) charges only.**
- Only the following 23A charges are rated for dry gas conditions.

Part Number	Explosive
EC2-23A1121-LS	10.5g, RDX
EC2-23A1122-LS	10.5g, HMX
EC2-23A1121-RC-LS	10.5g, RDX
EC2-23A1122-RC-LS	10.5g, HMX

2-3/8" - FLUID CONDITIONS

For 2-3/8" perforating in **fluid**:

- Maximum shot density is **6 spf.**
- All of the following 23A charges are rated for perforating in fluid conditions.

Part Number	Explosive
EC2-23A1121-RC	11.0g, RDX
EC2-23A1122-RC	11.0g, HMX
EC2-23A1121	11.0g, RDX
EC2-23A1122	11.0g, HMX
EC2-23A1121-E	11.0g, RDX
EC2-23A1122-E	11.0g, HMX

Part Number	Explosive
EC2-23A1121-LS	10.5g, RDX
EC2-23A1122-LS	10.5g, HMX
EC2-23A1121-RC-LS	10.5g, RDX
EC2-23A1122-RC-LS	10.5g, HMX
EC2-23A1171-R	11.0g, RDX

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	5 SPF	6 SPF
60°	Carrier	C2305-A***	C2306-A***
	Load Tube	T6825A-05-A***	T6825A-06-A***
All	Top Endplate	GN-EP23-6800	
	Bottom Endplate	GN-EP23-6815	
	Snap Rings	N5000-193 (QTY 2)	
	TCP Transfer Kits	GN-020-0100, GN-020-0100HT	

*** *Total number of shots.*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	2.39" [60.71] / 0.230 [5.84]
Upper/Lower Thread Connections	2-1/32"-8P Stub ACME 2G

COMPONENTS AND ACCESSORIES

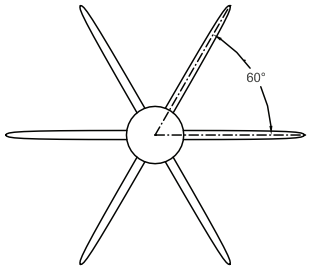
Description	Part Number(s)	
Top Subs, 2-3/8"		
Top Sub, TCP	GN-R23-0020	
Top Sub, Wireline	GN-R23-0035	
Top Sub Lift Sub Assembly, 1-9/16" and 2"	TC-QC15-000	
Tandem Subs, 2-3/8"		
Tandem Sub, TCP	GN-R23-0021	
Switch Tandem Sub, Wireline, *5.00" make-up length (MUL)*	GN-R23-T100-A	
Switch Tandem Sub, Wireline, *7.00" MUL*	RN-R23-T104-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-215	OR-N569-225
Viton (with back-up rings required for > 325°F)	OR-V95G-215	OR-V95G-225
Back-up rings for > 325°F	OR-B215-1308	OR-B225-2126
Thread Protectors		
Top Sub (Top Pin)	GN-THD-156-020	
Carrier (Gun) Protector	GN-THD-239-030	
Tandem Sub & Bull Plug Protector	GN-THD-239-040	
Bull Plugs		
2-3/8" Standard	GN-R23-0022	
2-3/8" with Sucker Rod Box Connection	GN-R23S-0022	
Setting Tool Adapter Sub	GN-R23-ST50	

Conventional Long Guns
2-1/2 in (64 mm), RTG, 4 and 6 SPF, XDP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	40-grain ribbon
Compatible Perforating Charges	Connex®, Razor®, Basix™, Refrax™
Maximum Gun Swell (in)[mm]	2.66" [67.56] @ 11.5g (In Fluid)



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [137.90]
Maximum Tensile* (lbf)[kN]	137,500 [611.63] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA2506-6825A-**A*****	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	9.3 lb/ft (with sub)	7.3 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA2506-6825A-***A084***.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, with 60° (A) phasing (3" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
4 SPF Total Number of Loadable Shots	080	056	040	024	016
6 SPF Total Number of Loadable Shots	120	084	060	036	024

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
2-1/2" 11.5g	2511 Connex SDP	EC2-25A1121-RC	Fluid	11.5g, RDX	6 spf /60°	3-1/2" 9.2# L-80			0.28 [0.71]	11.50 [29.21]
		EC2-25A1122-RC		11.5g, HMX					0.29 [0.74]	12.00 [30.48]
	2511 Razor XDP	EC1-25A1121		11.5g, RDX					0.26 [0.66]	13.00 [33.02]
		EC1-25A1122		11.5g, HMX			0.32 [0.81]	31.10 [78.99]	0.24 [0.61]	12.23 [31.06]
	2511 Basix XDP	EC2-25A1121-E		11.5g, RDX					0.30 [0.76]	9.10 [23.11]
		EC2-25A1122-E		11.5g, HMX						

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing				Outer Casing			
						OD/Wt/ Material	EHD Range *(in)[cm]*	EHD Avg *(in)[cm]*	EHD Variance*	OD/Wt/ Material	EHD Range *(in)[cm]*	EHD Avg *(in)[cm]*	EHD Variance*
2-1/2" 11.0g	2511 Refrax	EC2-25A1171-R	Fluid	11.0g, RDX	6 spf / 60°	3-1/2" 9.2# P110	0.39-0.41 [0.99-1.04]	0.40 [1.02]	2.23 %	4-1/2" 13.5# P110	0.43-0.49 [1.09-1.24]	0.46 [1.17]	5.68 %
						4" 9.5# P110	0.37-0.45 [0.94-1.14]	0.40 [1.02]	8.25 %	5-1/2" 23# P110	0.38-0.48 [0.97-1.22]	0.43 [1.09]	8.26 %
	2511 Connex	EC2-25A1121-RC	Fluid	11.0g, RDX		3-1/2" 9.2# P110	0.34-0.40 [0.86-1.02]	0.36 [0.91]	4.69 %	4-1/2" 13.5# P110	0.28-0.33 [0.71-0.84]	0.31 [0.79]	6.53 %
	2511 Basix	EC2-25A1121-E	Fluid	11.0g, RDX		3-1/2" 9.2# P110	0.37-0.41 [0.94-1.04]	0.39 [0.99]	3.47 %	4-1/2" 13.5# P110	0.32-0.37 [0.81-0.94]	0.33 [0.84]	5.49 %

**EHD variation decentralized.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	6 SPF
60°	Carrier	C2504-A***	C2506-A***
	Load Tube	T6825A-04-A***	T6825A-06-A***
All	Top Endplate	GN-EP25-6800	
	Bottom Endplate	GN-EP25-6815	
	Snap Rings	N5000-200 (QTY 2)	
	TCP Transfer Kits	GN-020-0100, GN-020-0100HT	

*** *Total number of shots.*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	2.50" [63.50] / 0.250 [6.35]
Upper/Lower Thread Connections	2-1/8" - 8P ACME 2G

COMPONENTS AND ACCESSORIES

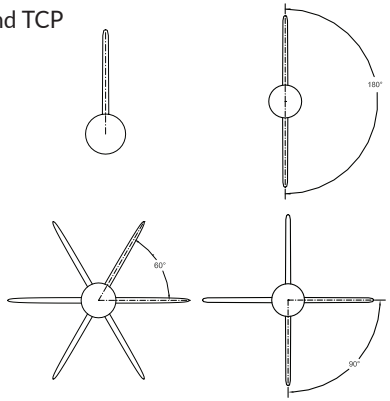
Description	Part Number(s)	
Top Sub Lift Sub Assembly, 1-9/16" and 2"	TC-QC15-000	
Top Subs, 2-1/2"		
Top Sub, TCP	GN-R25-0020	
Top Sub, Wireline	GN-R25-0035	
Tandem Subs, 2-1/2"		
Tandem Sub, TCP	GN-R25-0021	
Switch Tandem Sub, Wireline, *5.50" make-up length (MUL)*	GN-R25-T100-A	
Switch Tandem Sub, Wireline, *7.00" MUL*	GN-R25-T104-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-215	OR-N569-225
Viton (with back-up rings required for > 325°F)	OR-V95G-215	OR-V95G-225
Back-up rings for > 325°F	OR-B215-1308	OR-B225-2160
Thread Protectors		
Top Sub (Top Pin)	GN-THD-156-020	
Carrier (Gun) Protector	GN-THD-250-030	
Tandem Sub & Bull Plug Protector	GN-THD-250-040	
Bull Plug, 2-1/2"	GN-R25-0022	

Conventional Long Guns
2-3/4 in (70 mm), 4 and 6 SPF

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™, Refrax™, GEOPunch™
Maximum Gun Swell (in)[mm]	2.91 [73.91] @ 15.0g In Fluid; 3.02 [76.20] @ 15.0g Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	25,000 [172.37]
Maximum Tensile* (lbf)[kN]	176,600 [785.56] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA2706-6827A-**A***	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	11.82 lb/ft (with sub)	9.82 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA2706-6827A-**A084**.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, 6827A load tube with 0° (O), 60° (A), 90° (B), or 120° (G) phasing (3" shot spacing)
- 4 spf, up to 80 shots per gun, 6827TI load tube with 60° (A) or 90° (B) phasing (3" shot spacing)
- 6 spf, up to 120 shots per gun, 6827A load tube with 0° (O) or 60° (A***T) true shot interval (2" shot spacing)
- 6 spf, up to 120 shots per gun, 6827TI load tube with 60° (A) or 60° (A***T) true shot interval (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
4 SPF Total Number of Loadable Shots	080	056	040	024	016
6 SPF Total Number of Loadable Shots	120	084	060	036	024

Conventional Long Guns
2-3/4 in (70 mm), 4 and 6 SPF

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD^ *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
2-3/4" 11g-15g	FracIQ 30	EC2-27A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD P110	0.30 [0.76]	13.0 [33.02]	0.30 [0.76]	2.7 %	5.0 [12.70]
	FracIQ 35	EC2-27A1271		12.0g, RDX			0.35 [0.89]		0.35 [0.89]	5.9 %	
	FracIQ 40	EC2-27A1571		15.0g, RDX			0.40 [1.02]		0.40 [1.02]	6.3 %	

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
2-3/4" 15g	2715 Connex SDP	EC2-27A1521-RC	In Fluid or Dry	15.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.30 [0.76]	11.70 [29.72]
		EC2-27A1522-RC		15.0g, HMX					0.31 [0.79]	12.18 [30.94]
	2715 Razor XDP	EC2-27A1521		15.0g, RDX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1522		15.0g, HMX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1523		15.0g, HNS					0.31 [0.79]	10.50 [26.67]
	2715 Basix XDP	EC2-27A1521-E		15.0g, RDX			0.39 [0.99]	31.80 [80.77]	0.32 (0.81)	9.40 [23.88]
		EC2-27A1522-E		15.0g, HMX			0.38 [0.97]	32.75 [83.19]	0.35 [0.89]	10.60 [26.92]

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing	
						O.D./Material	EHD *(in)[cm]*	O.D./Material	EHD *(in)[cm]*
2-3/4" 11g-15g	2711 Refrax	EC2-27A1171-R	Fluid	11.0g, RDX	6 spf / 60°	4" P110	0.29-0.30 [0.74-0.76]	5-1/2" P110	0.37-0.41 [0.94-1.04]
	2715 Refrax	EC2-27A1571-R		15.0g, RDX			0.34-0.36 [0.86-0.91]		0.34-0.42 [0.86-1.07]

DYNAMIC UNDERBALANCE PUNCHERS

Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
2-3/4"	2708 GEOPunch RDX	EC2-27A0861	8.0g, RDX	1.05 [2.67]
	2708 GEOPunch HMX	EC2-27A0862	8.0g, HMX	
	2708 GEOPunch HNS	EC2-27A0863	8.0g, HNS	

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	6 SPF
0°	Carrier	C2704-O***	C2706-O***
	Load Tube	T6827A-04-O***	T6827A-06-O***
60°	Carrier	C2704-A***	C2706-A***
	Load Tube	T6827A-04-A***	T6827A-06-A***
90°	Carrier	C2704-B***	
	Load Tube	T6827A-04-B***	
120°	Carrier	C2704-G***	
	Load Tube	T6827A-04-G***	
All	Top Endplate	GN-EP27-6800	
	Bottom Endplate	GN-EP27-6815	
	Snap Rings	N5000-212 (QTY 2)	
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT	

**** Total number of shots. Load tubes 6827TI and A***T (true shot) also available.*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	2.75" [69.85] / 0.313 [7.95]
Upper/Lower Thread Connections	2.375" - 6P ACME 2G

Top Sub, TCP
GN-R27-0020

Tandem Sub, TCP
GN-R27-0021

Switch Tandem Sub, Wireline
GN-R27-T100-A

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Subs, 2-3/4"		
Top Sub, TCP	GN-R27-0020	
Top Sub, Wireline	GN-R27-0035	
Top Sub Lift Sub Assembly, 2-3/4" and 2-7/8"	TC-QC27-000	
Tandem Subs, 2-3/4"		
Tandem Sub, TCP	GN-R27-0021	
Switch Tandem Sub, Wireline, Ported, *3" make-up length*	GN-R27-T100-A	
Aligning Switch Sub, LH Lock Ring	GN-R27-T125-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-225	OR-N569-227
Viton (with back-up rings required for > 325°F)	OR-V95G-225	OR-V95G-227
Back-up rings for > 325°F	OR-B225-2160	OR-B227-2405
Thread Protectors		
Top Sub (Top Pin)	GN-THD-QC27-020	
Carrier (Gun) Protector	GN-THD-275-030	
Tandem Sub & Bull Plug Protector	GN-THD-275-040	
Bull Plugs		
2-3/4" Standard	GN-R27-0022	
2-3/4" with 2-3/8" EUE Pin	GN-R27-0023	
2-3/4" Shoot-Thru	GN-R27-ST27	
2-3/4" Shoot-Thru Assembly *(GN-R27-T150-A and GN-R27-ST27)*	GN-R27-ST30	

Aligning Switch Sub, LH Lock Ring
GN-R27-T125-A

Bull Plug
GN-R27-0022

2-3/4" Switch Sub Assembly
GN-R27-T150-A

2-3/4" Shoot-Thru
GN-R27-ST27

2-3/4" Shoot-Thru Assembly
GN-R27-ST30
Switch NOT included (shown for reference only)

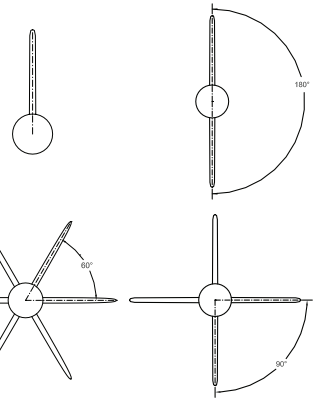
Revised: August 20, 2025 12:34 PM

Conventional Long Guns
2-7/8 in (73 mm), 4 and 6 SPF

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	3.07 [77.98] @ 18.0g In Fluid; 3.13 [79.50] @ 15.0g Dry



ENVIRONMENTAL

	Standard	High Pressure
Maximum Pressure (psi)[MPa]	20,000 [138]	25,000 [172]
Maximum Tensile* (lbf)[kN]	213,700 [950]	213,700 [950]

**Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number		Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
		(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
27A Charge Case	GA2806-6827A-**A***	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	12.04 lb/ft (with sub)	10.17 lb/ft (with sub)
	† **GA28H06**-6827A-**A***								
28A Charge Case	GA2806-6528A-**A***	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	12.04 lb/ft (with sub)	10.17 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA2806-6827A-**A084**. † GA28H = high-pressure system.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, 68**27A** load tube with 0° (O), 60° (A), or 90° (B) phasing (3" shot spacing)
- 6 spf, up to 120 shots per gun, 68**27A** load tube with 100° (K) phasing (2" shot spacing)
- 4 spf, up to 80 shots per gun, 65**28A** load tube with 60° (A) phasing (3" shot spacing)
- 6 spf, up to 120 shots per gun, 65**28A** load tube with 100° (K) phasing or 60° (A***T) true shot interval (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
4 SPF Total Number of Loadable Shots	080	056	040	024	016
6 SPF Total Number of Loadable Shots	120	084	060	036	024

Conventional Long Guns
2-7/8 in (73 mm), 4 and 6 SPF

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD^ *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
2-7/8" 11g-15g	FracIQ 30	EC2-27A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD P110	0.30 [0.76]	13.0 [33.02]	0.30 [0.76]	2.7 %	5.0 [12.70]
	FracIQ 35	EC2-27A1271		12.0g, RDX			0.35 [0.89]		0.35 [0.89]	5.9 %	
	FracIQ 40	EC2-27A1571		15.0g, RDX			0.40 [1.02]		0.40 [1.02]	6.3 %	
2-7/8" 11g-16g	FracIQ 35	EC2-28A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD P110	0.36 [0.91]	13.0 [33.02]	0.36 [0.91]	3.3 %	5.0 [12.70]
		EC2-28A1172		11.0g, HMX			0.36 [0.91]		0.36 [0.91]	2.1 %	
	FracIQ 40	EC2-28A1671		16.0g, RDX			0.40 [1.02]		0.40 [1.02]	2.7 %	
		EC2-28A1672		16.0g, HMX			0.40 [1.02]		0.40 [1.02]	2.7 %	

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
2-7/8" 15g	2715 Connex SDP	EC2-27A1521-RC	In Fluid or Dry	15.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.30 [0.76]	11.70 [29.72]
		EC2-27A1522-RC		15.0g, HMX					0.31 [0.79]	12.18 [30.94]
		EC2-27A1523-RC		15.0g, HNS					0.25 [0.64]	9.90 [25.15]
	2715 Razor XDP	EC2-27A1521		15.0g, RDX					0.26 [0.66]	13.50 [34.29]
		EC2-27A1522		15.0g, HMX			0.34 [0.86]	42.46 [107.85]	0.30 [0.76]	13.13 [33.35]
		EC2-27A1523		15.0g, HNS					0.31 [0.79]	10.50 [26.67]
	2715 Basix XDP	EC2-27A1521-E		15.0g, RDX					0.32 (0.81)	9.40 [23.88]
		EC2-27A1522-E		15.0g, HMX						
2-7/8" 18g	2818 Connex SDP	EC2-28A1821-RC	Fluid	18.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.42 [1.07]	13.00 [33.02]
		EC2-28A1822-RC		18.0g, HMX					0.40 [1.02]	14.02 [35.61]
		EC2-28A1823-RC		18.0g, HNS					0.33 [0.84]	10.55 [26.80]
	2818 Razor XDP	EC2-28A1821		18.0g, RDX			0.43 [1.09]	40.05 [101.73]	0.41 [1.04]	14.10 [35.81]
		EC2-28A1822		18.0g, HMX			0.43 [1.09]	40.05 [101.73]	0.37 [0.94]	15.33 [38.94]
		EC2-28A1823		18.0g, HNS			0.32 [0.81]	32.38 [82.25]	0.33 [0.84]	10.95 [27.81]
	2818 Basix XDP	EC2-28A1821-E		18.0g, RDX					0.47 [1.19]	10.70 [27.18]
		EC2-28A1822-E		18.0g, HMX						

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
2-7/8" 15g	2715 Connex XEH	EC2-27A1541-RC	In Fluid or Dry	15.0g, RDX	6 spf / 60°	4-1/2"			0.30 [0.76]	12.30 [31.24]
		EC2-27A1542-RC		15.0g, HMX					0.35 [0.89]	11.60 [29.46]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF (27A)	6 SPF (27A)	4 SPF (28A)	6 SPF (28A)
0°	Carrier	C2804-O***			
	Load Tube	T6827A-04-O***			
60°	Carrier	C2804-A***	C2806-A***	C2804-A***	C2806-A***
	Load Tube	T6827A-04-A***	T6827A-06-A***	T6528A-04-A***	T6528A-06-A***
60° *(true shot)*	Carrier		C2806-A***T		C2806-A***T
	Load Tube		T6827A-06-A***T		T6528A-06-A***T
90°	Carrier	C2804-B***			
	Load Tube	T6827A-04-B***			
100°	Carrier		C2806-K***		C2806-K***
	Load Tube		T6827A-06-K***		T6528A-06-K***
All	Top Endplate	GN-EP28-6800		GN-EP28-6800	
	Bottom Endplate	GN-EP28-6815		GN-EP28-6815	
	Snap Rings	N5000-225 (QTY 2)			
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT			

**** Total number of shots; A***T (true shot)*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	2.875" [73.03] / 0.313 [7.95]; **GA28H06 wall thickness: 0.363 [9.22]
Upper/Lower Thread Connections	2.500" - 6P ACME 2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Subs, 2-7/8"		
Top Sub, TCP	GN-R28-0020	
Top Sub, 2-7/8" with 3-1/8" QC	GN-R28-0020QC	
Top Sub, Wireline	GN-R28-0035	
Top Sub Lift Sub Assembly, 2-3/4" and 2-7/8"	TC-QC27-000	
Tandem Subs, 2-7/8"		
Tandem Sub, TCP	GN-R28-0021	
Switch Tandem Sub, Wireline, Ported *(6.25" make-up length)*	GN-R28-T150-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-225	OR-N569-228
Viton (with back-up rings required for > 325°F)	OR-V95G-225	OR-V95G-228
Back-up rings for > 325°F	OR-B225-2160	OR-B228-2560
Thread Protectors		
Top Sub (Top Pin)	GN-THD-QC27-020	
Carrier (Gun) Protector	GN-THD-288-030	
Tandem Sub & Bull Plug Protector	GN-THD-288-040	
Bull Plugs		
2-7/8" Standard	GN-R28-0022	
2-7/8" with 2-3/8" EUE Pin	GN-R28-0023	
2-7/8 Shoot-Thru	GN-R28-ST27	

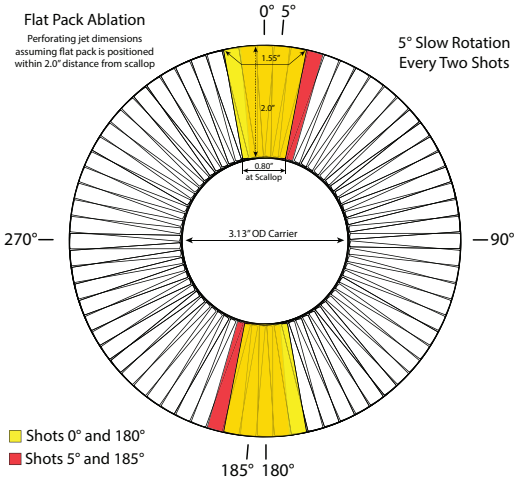
SaberJet™
3-1/8 in (79 mm), 5.14 SPF, Flat Pack Ablation

GEODynamics

GEODynamics' SaberJet™ efficiently severs flat pack control lines across large (0.75") water gaps and in various casing sizes, enabling a streamlined, cost-effective perf, wash, and cement (PWC) operation in a single trip. This advanced solution eliminates the need for control line terminations, pipe cutting, as well as recovery of the completion tubing string. By reducing time and costs associated with tubing recovery and transportation back to shore, SaberJet also eliminates the high expenses of handling LSA-contaminated tubing, minimizing risk, and enhancing efficiency in plug and abandon (P&A) applications.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor® Flat Pack Ablation (FPA)
Maximum Gun Swell (in)[mm]	3.33 [84.58] @ 23g in Fluid (3-1/8" OD gun) 3.57 [90.68] @ 23g in Fluid (3-3/8" OD gun)



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	18,700 psi [128.93]
Maximum Tensile* (lbf)[kN]	202,300 [900] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Number of Shots	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Carrier Assy Weights w/+5% Adjustment	
		(spf) [spm]	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(lbs)*	*(kg)*
GA31514-6033-AB103	103	5.14 spf	0°-180° Rotated 5° every two shots	7.00	17.78	2.333	59.27	24.0	11.0
GA31514-6033-AB073	73			6.00	15.24			29.0	13.0
GA31514-6033-AB052	52			6.50	16.51			45.0	20.5
GA31514-6033-AB031	31			7.00	17.78			78.0	35.5
GA31514-6033-AB016	16			6.50	16.51			121.0	55.0

Additional gun lengths available by special order with lead time:

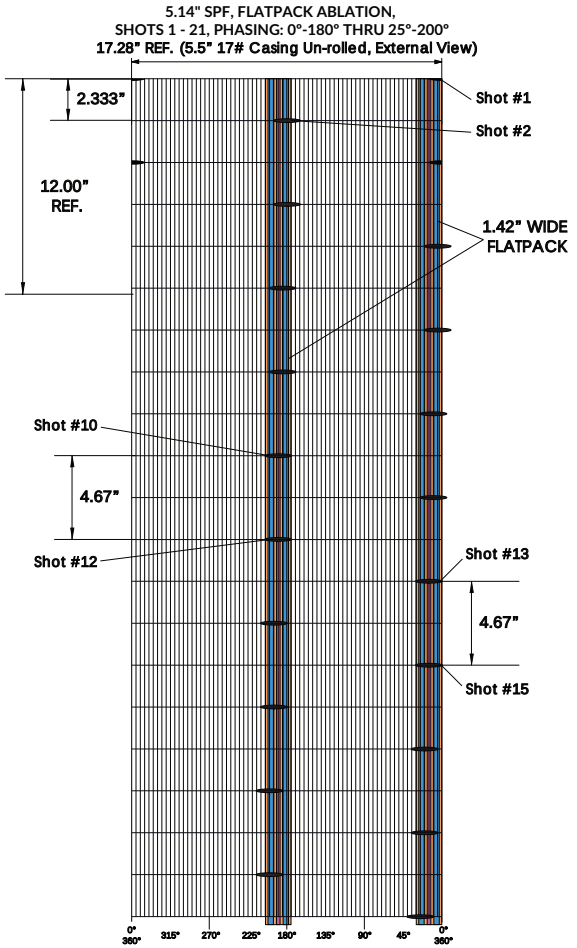
Available Gun Lengths	21'	15'	11'	7'	4'
*** 5.14 SPF Total Number of Loadable Shots	103	073	052	031	016

FLAT PACK ABLATION CHARGE PERFORMANCE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing Tested	Casing Tested	Water Gap *(in)[cm]*	Casing Cut Length *(in)[cm]*	Max. Casing Cut Width *(in)[cm]*
3-1/8"	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX	5.14 spf / 0°-180° *(5° slow rotation every two charges)*	5-1/2" 17# L-80	1.0 [2.54]	1.37 [3.48] *avg.*	0.21 [0.53] *avg.*
						5-1/2" 23# Chrome	0.75 [1.91]	1.34 [3.40] *avg.*	0.18 [0.46] *avg.*
3-3/8"	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX		5-1/2" 23# Chrome		1.30 [3.30] *avg.*	0.20 [0.51] *avg.*
						6-5/8" 28# Chrome		1.55 [3.94] *avg.*	0.21 [0.53] *avg.*
4"	3323 Razor FPA	EC2-33A2321-FPA	Fluid	23.0g, RDX		6-5/8" 28# Chrome		1.46 [3.71] *avg.*	0.20 [0.51] *avg.*
		EC2-33A2322-FPA		23.0g, HMX					
		EC2-33A2323-FPA		23.0g, HNS					

3-1/8" 5.14SPF, 15' GUN, PHASING 0°-180°, 5° SLOW ROTATION, CENTRALIZED IN 5-1/2" 17# L-80 CASING,
AVERAGE SLOT SIZES: 1.37" LENGTH X 0.21" WIDTH

FLAT PACK DIMENSIONS (PRE-TEST): 1.417" X 0.55"
3-1/8" 5.14SPF IN 5-1/2" 17# L-80 CASING (SEVERED FLAT PACK IS ~4.67" IN LENGTH)



Revised: August 20, 2025 12:34 PM

GUN ASSEMBLY COMPONENTS AND ACCESSORIES

Description	Part Number(s)
3-1/8" Top Sub, Conventional and TCP	GN-R31-0020
3-1/8" Tandem Sub, Conventional and TCP	GN-R31-0021
3-1/8" Transfer Assembly Centralizer, 24" *(refer to assembly details on next page)*	GN-R31CEN-2390
Bow Spring Centralizers *(ordered separately, refer to details on next page)*:	
Bow Spring Centralizer, 2.375 x 4.500 OD	GN-250-0023-4500-4
Bow Spring Centralizer, 2.375 x 5.500 OD	GN-250-0023-5500-4
Bow Spring Centralizer, 2.375 x 5.780 OD	GN-250-0023-5780-4
O-Ring Materials and Size, Nitrile *(standard option)*	OR-N569-230
Bull Plugs	
3-1/8" Standard	GN-R31-0022
3-1/8" with 2-3/8" EUE Pin	GN-R31-0023
3-1/8" with 2-7/8" EUE Pin	GN-R31-0024
Thread Protectors	
Carrier (Gun) Protector, 3-1/8"	GN-THD-312-030
Carrier (Gun) Plastic Plug Protector, 3-1/8"	GN-THD-312-300
Top Sub (Top Pin) Protector, 3-1/8"	GN-THD-312-020
Tandem Sub & Bull Plug Thread Protector, 3-1/8"	GN-THD-312-040
Bottom Sub Thread Protector (lower connection), 3-1/8"	GN-THD-312-040
Internal Carrier Assembly Components	
Carriers	C31514-AB***
Load Tubes	T6033-514-AB***
Top Endplate	GN-EP31-6000
Bottom Endplate	GN-EP31-6015
Snap Rings	N5000-250
TCP Transfer Kits	GN-000-0025/0025HT

****Represents total number of shots (e.g., for an 11' gun with 052 shots, the carrier is C31514-AB052 and the charge tube is T6033-514-AB052)*

3-1/8" Top Sub
GN-R31-0020

3-1/8" Tandem Sub
GN-R31-0021

3-1/8" Bull Plug, Standard
GN-R31-0022

HARDWARE SPECIFICATIONS

Gun Body Config/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube	Round steel tube strip, bend tab retention
Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]
Upper/Lower Thread Connections	2.750" 6P ACME-2G

3-1/8" 5.14SPF, 0°-180° Phasing
GA31514-6033-AB052 (shown)

Shown with: 3-1/8" Transfer Assembly, 24" Centralizer
GN-R31CEN-2390

Bow Spring Centralizer, 2.375 x 5.500 OD
GN-250-0023-5500-4 (ordered separately)

CENTRALIZER ASSEMBLY COMPONENTS AND ACCESSORIES

Description	Part Number(s)
3-1/8" x 2.39" Orienting Tandem Crossover Sub Assembly	GN-RX3123-0021G-A
Lock Ring, Left-Hand Thread	GN-R31-L001-319
TCP Sub Insert	GN-000-0067
Crimp Tube	GN-000-0027S
Grommet	GN-000-0004
O-Rings, #021, (QTY 2)	OR-N569-021
O-Rings, #230, (QTY 2)	OR-N569-230
O-Rings, #225, (QTY 2)	OR-N569-225
2.39" Blank Carrier, 24"	GN-DC23-024
3-1/8" x 2.39" Transfer Sub Crossover	GN-RX3123-0060
Endplate 3.125" w/2.0" Tube	GN-EP31-600
Crimp Tube	GN-000-0003
Grommet	GN-000-0004
Booster Retainer, 1.53" Long	GN-000-0005
TCP Insert Body	GN-020-0001
O-Rings, #225, (QTY 2)	OR-N569-225
Snap Ring	N5000-156
Snap Ring	N5000-250

BOW SPRING CENTRALIZERS - 4-BOW WELDED HINGE TYPE

Part Number	Description	Casing Size	Nominal ID	Overall Length	Collar Material	Bow Material
GN-250-0023-4500-4	2.375 x 4.500 OD (23B Bow)	2.375 in.	4.50 in.	19.625 in.	A569 (14 ga. X 4.00")	A588 (0.175 x 1.25")
GN-250-0023-5500-4	2.375 x 5.500 OD (35B Bow)	2.375 in.	5.50 in.			
GN-250-0023-5780-4	2.375 x 5.780 OD (42B Bow)	2.375 in.	5.780 in.			

Part Number	Performance Ratings*		
	Starting Force	Running Force	Restoring Force
GN-250-0023-4500-4	150 lbs	49 lbs	869 lbs
GN-250-0023-5500-4	117 lbs	38 lbs	709 lbs
GN-250-0023-5780-4	108 lbs	35 lbs	664 lbs

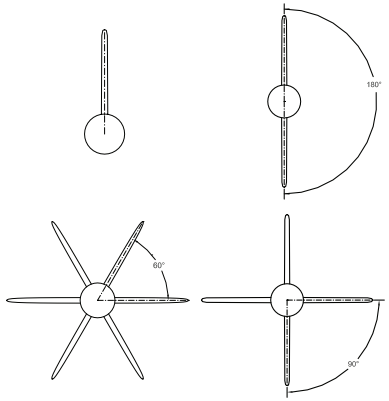
**Specifications are interpolated values from a single base test and are to be used for reference only*

Conventional Long Guns
3-1/8 in (79 mm), 4-6 SPF

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™, Basix™ Frac, Refrax™
Maximum Gun Swell (in)[mm]	3.46 [87.88] @ 22.7g In Fluid; 3.60 [91.44] @ 19.0g Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	22,500 [155.13]
Maximum Tensile* (lbf)[kN]	202,300 [900] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA3104-6033A-**B*****	4 spf [13 spm]	90°	7.50	190.50	3.00	76.20		
GA3106-6033A-**A*****	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	14.25 lb/ft	11.37 lb/ft

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA3106-6033A-***A084***.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, with 0° (O), 60° (A), 90° (B), or 120° (G) phasing (3" shot spacing)
- 5 spf, up to 100 shots per gun, with 60° (A) or 180° (J) phasing (2.4" shot spacing)
- 6 spf, up to 120 shots per gun, 6033TI load tube with 60° (A) phasing, or 6033A load tube with 60° (A***T) true shot interval (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
*** 4 SPF Total Number of Loadable Shots	080	056	040	024	016
*** 5 SPF Total Number of Loadable Shots	100	070	050	030	020
*** 6 SPF Total Number of Loadable Shots	120	084	060	036	024
*** 6 SPF True Shot, Total Loadable Shots	121	085	061	037	025

Revised: August 20, 2025 12:34 PM

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.22 [0.56]	13.0 [33.02]	0.22 [0.56]	5.5%	5.0 [12.70]
	Basix Frac 25	EC2-33A1271-BF		12.0g, RDX			0.26 [0.66]	12.0 [30.48]	0.26 [0.66]	2.4 %	4.0 [10.16]
	FracIQ 25	EC2-33A1371		13.0g, RDX			0.26 [0.66]	13.0 [33.02]	0.26 [0.66]	4.1 %	5.0 [12.70]
3-1/8" 13g-16g	FracIQ Connex 30 †	EC2-33A1471-FRX	Fluid	14.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.31 [0.79]	6.0 %	5.0 [12.70]
	Basix Frac 30	EC2-33A1471-BF		14.0g, RDX			0.31 [0.79]	12.0 [30.48]	0.31 [0.79]	4.0 %	4.0 [10.16]
	FracIQ 30	EC2-33A1671		16.0g, RDX			0.31 [0.79]	13.0 [33.02]	0.31 [0.79]	3.1 %	5.0 [12.70]
	FracIQ 30	EC2-33A1672		16.0g, HMX			0.34 [0.86]		0.34 [0.86]	3.8 %	
3-1/8" 16g-20g	FracIQ Connex 35 †	EC2-33A1671-FRX	Fluid	16.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.36 [0.91]	5.0 %	5.0 [12.70]
	Basix Frac 35	EC2-33A1871-BF		18.0g, RDX			0.36 [0.91]	12.0 [30.48]	0.36 [0.91]	3.4 %	4.0 [10.16]
	FracIQ 35	EC2-33A2071		20.0g, RDX			0.36 [0.91]	13.0 [33.02]	0.36 [0.91]	2.5 %	5.0 [12.70]
	FracIQ 35	EC2-33A2072		20.0g, HMX			0.37 [0.94]		0.37 [0.94]	3.0 %	
3-1/8" 19g-23g	FracIQ Connex 40 †	EC2-33A1971-FRX	Fluid	19.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.41 [1.04]	6.5 %	5.0 [12.70]
	FracIQ 40	EC2-33A2371		23.0g, RDX			0.40 [1.02]	13.0 [33.02]	0.40 [1.02]	3.3 %	
	FracIQ 40	EC2-33A2372		23.0g, HMX			0.41 [1.04]		0.41 [1.04]	3.8 %	
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX			0.40 [1.02]	12.0 [30.48]	0.40 [1.02]	6.6 %	4.0 [10.16]
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX		6" OD, P110	0.40 [1.02]		0.40 [1.02]	7.5 %	
	Basix Frac 40	EC2-33A2372-BF		23.0g, HMX		4-1/2" - 5-1/2" OD, P110					
3-1/8" 20g-23g	FracIQ 45	EC2-33A2071-45	Fluid	20.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.45 [1.14]	13.0 [33.02]	0.45 [1.14]	5.6 %	5.0 [12.70]
	FracIQ Connex 45 †	EC2-33A2371-FRX		21.0g, RDX					0.45 [1.14]	3.2 %	
	Basix Frac 45	EC2-33A2371-BF45		23.0g, RDX			0.45 [1.14]	12.0 [30.48]	0.45 [1.14]	5.9 %	4.0 [10.16]
3-1/8" 23g	FracIQ 50	EC2-33A2371-50 †† EC2-33A2371-50G	Fluid	23.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.50 [1.27]	13.0 [33.02]	0.50 [1.27]	1.5 %	5.0 [12.70]
	FracIQ 50	EC2-33A2372-RX		23.0g, HMX		5-1/2" OD, P110	0.50 [1.27]		0.50 [1.27]	4.6 %	
	Basix Frac 50	EC2-33A2371-BF50		23.0g, RDX		4-1/2" - 5-1/2" OD, P110	0.50 [1.27]	12.0 [30.48]	0.50 [1.27]	4.8 %	4.0 [10.16]
	FracIQ 55	EC2-33A2371-55		23.0g, RDX		4-1/2" OD, P110	0.55 [1.40]	13.0 [33.02]	0.55 [1.40]	3.8 %	5.0 [12.70]

†FracIQ® Connex® charges (part numbers ending with -FRX) designate charges that combine FracIQ technology with Connex Clean Perforation Technology to achieve a constant hole size and tunnel cleaning action in one shaped charge. ††EC2-33A2371-50G has a custom, externally-grooved case (special application).
**3-1/8" FracIQ charge performance is compatible in 4.5" 11.6-15.1# and 5.5" 17-23# P-110 casing.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 19g	3319 Connex RX	EC2-33A1991-RX	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921	‡ Fluid or Dry	19.0g, RDX			0.51 [1.30]	42.10 [106.93]		
		EC2-33A1922		19.0g, HMX			0.49 [1.24]	41.10 [104.39]	0.43 [1.09]	14.60 [37.08]
	3319 Basix XDP	EC2-33A1921-E	‡ Fluid or Dry	19.0g, RDX			0.43 [1.09]	35.80 [90.93]		
		EC2-33A1922-E		19.0g, HMX						
	3319 Basix XDP	EC2-33A1921-EG	Fluid	19.0g, RDX			0.43 [1.09]	35.70 [90.68]		
	3319 Basix DP	EC2-33A1951	‡ Fluid or Dry	19.0g, RDX			0.54 [1.37]	29.20 [74.17]		
		EC2-33A1952		19.0g, HMX						
3-1/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.42 [1.07]	39.02 [99.11]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS			0.35 [0.89]	26.05 [66.17]	0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E		22.7g, RDX			0.42 [1.07]	46.00 [116.84]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.43 [1.09]	46.37 [117.78]		
	3323 Basix GH	EC2-33A2321-EG		22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX			0.43 [1.09]	45.70 [116.08]	0.40 [1.02]	11.90 [30.23]

‡ *For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.*

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing	
						O.D./Material	**EHD** *(in)[cm]*	O.D./Material	**EHD** *(in)[cm]*
3-1/8" 14g-23g	3314 Refrax	EC2-33A1471-D	Fluid	14.0g, RDX	6 spf / 60°	Expanded 4" P110	0.33-0.33 [0.84-0.84]	5-1/2 P110	0.30-0.30 [0.76-0.76]
	3316 Refrax	EC2-33A1671-D		16.0g, RDX			0.37-0.38 [0.94-0.95]		0.35-0.35 [0.89-0.89]
	3320 Refrax	EC2-33A2071-D		20.0g, RDX			0.41-0.42 [1.04-1.07]		0.40-0.40 [1.02-1.02]
	3316 Refrax	EC2-33A1671-D		16.0g, RDX	6 spf / 60°	4-1/2" P110	0.30-0.32 [0.76-0.81]	7.0" P110	0.39-0.41 [0.99-1.04]
	3323 Refrax	EC2-33A2371-D		23.0g, RDX			0.41-0.42 [1.04-1.07]		0.35-0.35 [0.89-0.89]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Conventional Long Guns
3-1/8 in (79 mm), 4-6 SPF

BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80	0.78 [1.98]	7.60 [19.30]		
		EC2-33A2332		22.7g, HMX			0.79 [2.01]	7.80 [19.81]		

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 19g	3319 Connex XEH	EC2-33A1941-RC	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
	3319 Basix GH	EC2-33A1941		19.0g, RDX			0.60 [1.52]	28.60 [72.64]		
		EC2-33A1942		19.0g, HMX						
3-1/8" 23g	3323 Connex XEH	EC2-33A2341-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2"			0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341-E		22.7g, RDX		5-1/2" 17.0# L-80	0.43 [1.09]	44.0 [111.76]		
		EC2-33A2342-E		22.7g, HMX		4-1/2"				

‡ For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	5 SPF	6 SPF
0°	Carrier	C3104-O***		
	Load Tube	T6033A-04-O***		
60°	Carrier	C3104-A***	C3105-A***	C3106-A***
	Load Tube	T6033A-04-A***	T6033A-05-A***	T6033A-06-A***
60° *(true shot)*	Carrier			C3106-A***T
	Load Tube			T6033A-06-A***T
90°	Carrier	C3104-B***		
	Load Tube	T6033A-04-B***		
120°	Carrier	C3104-G***		
	Load Tube	T6033A-04-G***		
180°	Carrier		C3105-J***	
	Load Tube		T6033A-05-J***	
All	Top Endplate	GN-EP31-6000		
	Bottom Endplate	GN-EP31-6015		
	Snap Rings	N5000-250 (QTY 2)		
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT		

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]
Upper/Lower Thread Connections	2.750" 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001
Top Subs, 3-1/8", Ported Top Sub Assembly, Ported, SQC Connection *(recommended)* Top Sub Assembly, Ported *(connects to industry-standard quick change)*	 GN-R31-CQC20-A GN-R31-T080-A
Top Sub, 3-1/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly	GN-R31-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020
Tandem Sub, 3-1/8", Conventional and TCP	GN-R31-0021
Switch Tandem Subs, 3-1/8", Ported Switch Sub Assembly, 12" long, *6.24" make-up length* Switch Sub Assembly, *3.25" make-up length*	 GN-R31-T150-A GN-R31-T101-A
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R31-T150L-A GN-R31-T150R-A GN-R31-T109R-A
Locking Rings, 3-1/8" Tandem Subs Left-Hand Thread, HD Right-Hand Thread, HD	 GN-R31-L001-319 GN-R31-R001-319
O-Ring Materials and Size, Nitrile *(standard option)*	OR-N569-230
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Bull Plugs 3-1/8" Standard 3-1/8" with 2-3/8" EUE Pin 3-1/8" with 2-7/8" EUE Pin	 GN-R31-0022 GN-R31-0023 GN-R31-0024
Thread Protectors Carrier (Gun) Protector, 3-1/8" Carrier (Gun) Plastic Plug Protector, 3-1/8" Top Sub (Top Pin) Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 3-1/8" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-312-030 GN-THD-312-300 GN-THD-312-020 GN-THD-312-040 GN-THD-312-040

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Short Quick Change Assembly
GN-QC31-0001

Top Sub, SQC Connection
GN-R31-CQC20-A

Switch Sub Assembly
GN-R31-T150-A

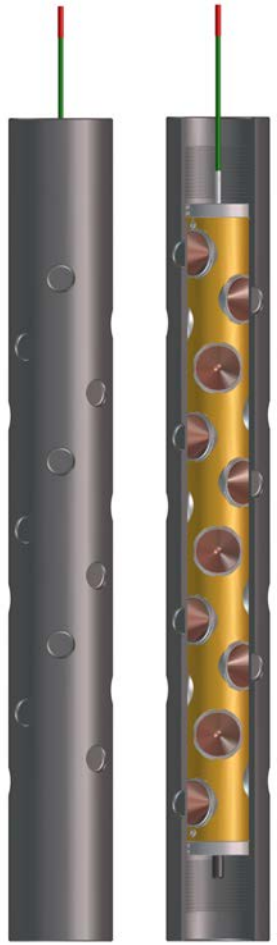
Aligning Switch Sub, LH Lock Ring
GN-R31-T150L-A

Plug/Shoot Adapter
GN-R31-ST30

Bull Plug, Standard
GN-R31-0022

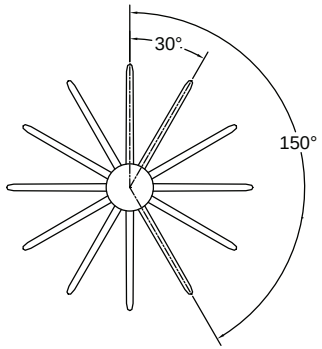
Conventional Long Guns
3-1/8 in (79 mm), 12 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (150° - 30°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Basix™
Maximum Gun Swell (in)[mm]	3.31 [84.07] @ 12.00g In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	202,300 [900] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA3112-6031B-**J****	12 spf [52 spm]	150°-30°	6.00	152.40	1.00	25.40	16.0 lb/ft	11.37 lb/ft

**** Total number of shots (e.g., 15' 12 SPF, 150° gun is GA3112-6031B-**J169**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 12g	3112 Basix SBH *Steel Case*	EC2-31B1231	Fluid	12.0g, RDX	12 spf/150°	5.0" 15.0# L-80	0.70 [1.78]	5.60 [14.22]	0.65 [1.65]	4.60 [11.68]
		EC2-31B1232		12.0g, HMX						

Also available with zinc cases; P/N EC2-31C1231 (RDX) and EC2-31C1232 (HMX). Blank charge cases, 31B, steel: P/N EP-1112-100; 31C, zinc: P/N EP-1208-100-D.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF
150°-30°	Carrier	C3112-J***
	Load Tube	T6031B-12-J***
All	Top Endplate	GN-EP31-6000
	Bottom Endplate	GN-EP31-6015
	Snap Rings	N5000-250 (QTY 2)
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]
Upper/Lower Thread Connections	2.750" 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001
Top Subs, 3-1/8", Ported Top Sub Assembly, Ported, SQC Connection *(recommended)* Top Sub Assembly, Ported *(connects to industry-standard quick change)*	 GN-R31-CQC20-A GN-R31-T080-A
Top Sub, 3-1/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly	GN-R31-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020
Tandem Sub, 3-1/8", Conventional and TCP	GN-R31-0021
Switch Tandem Subs, 3-1/8", Ported Switch Sub Assembly, 12" long, *6.24" make-up length* Switch Sub Assembly, *3.25" make-up length*	 GN-R31-T150-A GN-R31-T101-A
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R31-T150L-A GN-R31-T150R-A GN-R31-T109R-A
Locking Rings, 3-1/8" Tandem Subs Left-Hand Thread, HD Right-Hand Thread, HD	 GN-R31-L001-319 GN-R31-R001-319
O-Ring Materials and Size, Nitrile *(standard option)*	OR-N569-230
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Bull Plugs 3-1/8" Standard 3-1/8" with 2-3/8" EUE Pin 3-1/8" with 2-7/8" EUE Pin	 GN-R31-0022 GN-R31-0023 GN-R31-0024
Thread Protectors Carrier (Gun) Protector, 3-1/8" Carrier (Gun) Plastic Plug Protector, 3-1/8" Top Sub (Top Pin) Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 3-1/8" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-312-030 GN-THD-312-300 GN-THD-312-020 GN-THD-312-040 GN-THD-312-040

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Short Quick Change Assembly
GN-QC31-0001

Switch Sub Assembly
GN-R31-T150-A

Top Sub, SQC Connection
GN-R31-CQC20-A

Aligning Switch Sub, LH Lock Ring
GN-R31-T150L-A

Plug/Shoot Adapter
GN-R31-ST30

Bull Plug, Standard
GN-R31-0022

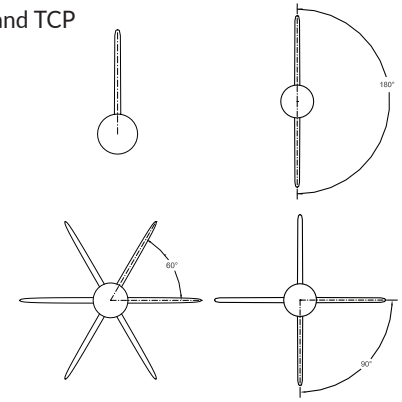
Conventional Long Guns
3-3/8 in (86 mm), 4-6 SPF

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	3.56 [90.42] @ 25.00g In Fluid; 3.63 [92.20] @ 22.7g Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	22,700 [156.51]
Maximum Tensile* (lbf)[kN]	331,900 [1476.36] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA3306-6033A-**A*****	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	15.25 lb/ft (with sub)	13.50 lb/ft (with sub)

**** Total number of shots (e.g., 15' 6 SPF, 60° gun is GA3306-6033A-**A084**.*

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, with 0° (O), 60° (A), 90° (B), or 120° (G) phasing (3" shot spacing)
- 5 spf, up to 100 shots per gun, with 60° (A) or 180° (J) phasing (2.4" shot spacing)
- 6 spf, up to 120 shots per gun, 6033TI load tube with 60° (A) phasing, or 6033A load tube with 60° (A***T) true shot interval (2" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
*** 4 SPF Total Number of Loadable Shots	080	056	040	024	016
*** 5 SPF Total Number of Loadable Shots	100	070	050	030	020
*** 6 SPF Total Number of Loadable Shots	120	084	060	036	024
*** 6 SPF True Shot, Total Loadable Shots	121	085	061	037	025

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
3-3/8 in (86 mm), 4-6 SPF

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Stressed Berea *(API RP19B Sec. 2)*		
							EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-3/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4.5"-5.5" OD P110	0.22 [0.56]	5.5%	5.0 [12.70]
	FracIQ 25	EC2-33A1371		13.0g, RDX		6.0" OD P110	0.26 [0.66]	2.3 %	

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
3-3/8" 19g	3319 Connex RX	EC2-33A1991-RX	In Fluid or Dry	19.0g, RDX	6 spf / 60°	5-1/2"			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921		19.0g, RDX		4-1/2" 11.6# L-80	0.51 [1.30]	42.07 [106.86]		
		EC2-33A1922		19.0g, HMX					0.43 [1.09]	14.60 [37.08]
3-3/8" 23g	3323 Connex SDP	EC2-33A2321-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.45 [1.14]	46.32 [117.65]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS					0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E	In Fluid or Dry	22.7g, RDX			0.45 [1.14]	46.32 [117.65]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.44 [1.12]	46.90 [119.13]		
	3323 Basix GH	EC2-33A2321-EG	Fluid	22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX					0.40 [1.02]	11.90 [30.23]
	3323 Basix DP	EC2-33A2351	In Fluid or Dry	22.7g, RDX			0.47 [1.19]	32.10 [81.53]		
		EC2-33A2352		22.7g, HMX						
3-3/8" 25g	3325 Connex SDP	EC2-33B2521-RC	Fluid	25.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.10 [38.35]
		EC2-33B2522-RC		25.0g, HMX					0.48 [1.22]	15.45 [39.24]
		EC2-33B2523-RC		25.0g, HNS					0.35 [0.89]	12.30 [31.24]
	3325 Razor XDP	EC2-33B2521		25.0g, RDX			0.45 [1.14]	44.58 [113.23]	0.39 [0.99]	17.10 [43.43]
		EC2-33B2522		25.0g, HMX			0.53 [1.35]	47.30 [120.14]	0.50 [1.27]	16.27 [41.33]
		EC2-33B2523		25.0g, HNS			0.37 [0.94]	30.20 [76.71]	0.36 [0.91]	13.20 [33.53]
	3325 Basix XDP	EC2-33B2521-E		25.0g, RDX			0.45 [1.14]	50.10 [127.25]	0.40 [1.02]	12.30 [31.24]
		EC2-33B2522-E		25.0g, HMX			0.47 [1.19]	47.42 [120.45]		

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
3-3/8 in (86 mm), 4-6 SPF

BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
3-3/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	5-1/2" 17.0# L-80	0.70 [1.78]	5.79 [14.71]	0.69 [1.75]	4.05 [10.29]
		EC2-33A2332		22.7g, HMX						

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
3-3/8" 19g	3319 Connex XEH	EC2-33A1941-RC	In Fluid or Dry	19.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
3-3/8" 23g	3323 Connex XEH	EC2-33A2341-RC	In Fluid or Dry	22.7g, RDX					0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341		22.7g, RDX			0.52 [1.32]	33.58 [85.29]		
		EC2-33A2342		22.7g, HMX						
3-3/8" 25g	3325 Connex XEH	EC2-33B2541-RC	Fluid	25.0g, RDX						
		EC2-33B2542-RC		25.0g, HMX					0.40 [1.02]	14.92 [37.90]
	3325 Basix GH	EC2-33B2541		25.0g, RDX			0.57 [1.45]	25.91 [65.81]	0.50 [1.27]	16.50 [41.91]

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF	5 SPF	6 SPF
0°	Carrier	C3304-O***		C3306-O***
	Load Tube	T6033A-04-O***		T6033A-06-O***
60°	Carrier	C3304-A***	C3305-A***	C3306-A***
	Load Tube	T6033A-04-A***	T6033A-05-A***	T6033A-06-A***
60° *(true shot)*	Carrier			C3306-A***T
	Load Tube			T6033A-06-A***T
90°	Carrier	C3304-B***		
	Load Tube	T6033A-04-B***		
120°	Carrier	C3304-G***		
	Load Tube	T6033A-04-G***		
180°	Carrier		C3305-J***	
	Load Tube		T6033A-05-J***	
All	Top Endplate	GN-EP33-6000		
	Bottom Endplate	GN-EP33-6015		
	Snap Rings	N5000-262 (QTY 2)		
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT		

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.375 [85.73] / 0.375 [9.53]
Upper/Lower Thread Connections	2.8125" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001	
Top Sub, 3-3/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly Top Sub, Wireline Top Sub, Ported, SQC Connection	GN-R33-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020 GN-R33-0035 GN-R33-CQC20-A	
Top Sub Lift Sub Assembly, 3-3/8"	TC-LT33-000	
Tandem Sub, 3-3/8", Conventional and TCP	GN-R33-0021	
Ported Switch Tandem Sub Assembly, 12" long, *6.24" make-up length* Ported Switch Tandem Sub Assembly, *3.25" make-up length*	GN-R33-T150-A GN-R33-T100-A	
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R33-T150L-A GN-R33-T150R-A GN-R33-T109R-A	
Locking Ring, Left-Hand Thread Locking Ring, Right-Hand Thread	GN-R33-L001 GN-R33-R001	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-231 OR-V95G-231 OR-B231-2870
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217	
3-3/8" Bull Plug, Standard 3-3/8" Bull Plug, with 2-3/8" EUE Pin 3-3/8" Bull Plug, with 2-7/8" EUE Pin	GN-R33-0022 GN-R33-0023 GN-R33-0024	
Plug/Shoot Adapter Assembly, 3-3/8"	GN-R33-ST30	
Thread Protectors, 3-3/8" Top Sub (Top Pin) Carrier (Gun) Plastic Plug Protector Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	 GN-THD-312-020 GN-THD-338-100 GN-THD-338-030 GN-THD-338-040	

Wireline Insert
GN-E00-0011

Short Quick Change Assembly
GN-QC31-0001

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Top Sub
GN-R33-0020

Top Sub, SQC Connection
GN-R33-CQC20-A

Tandem Sub
GN-R33-0021

Top Sub, Wireline
GN-R33-0035

Switch Tandem Sub Assy
GN-R33-T100-A

Switch Tandem Sub
GN-R33-T150

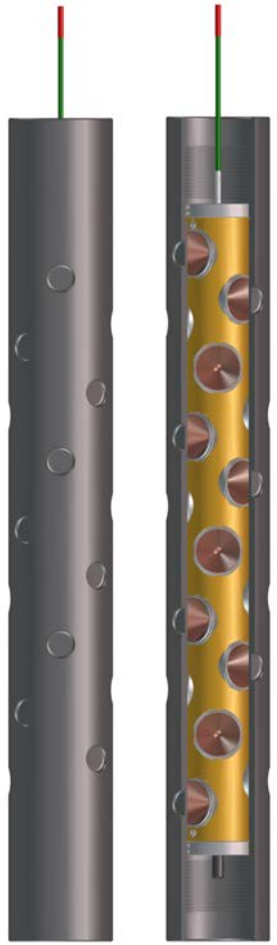
Bull Plug, Standard
GN-R33-0022

Plug/Shoot Adapter
GN-R33-ST30

Aligning Switch Sub,
LH Lock Ring
GN-R33-T150L-A

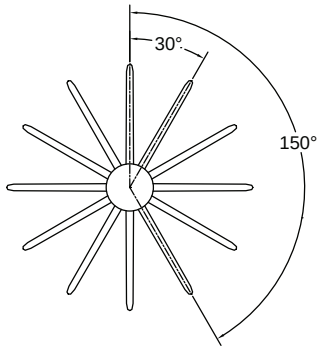
Conventional Long Guns
3-3/8 in (86 mm), 12 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (150° - 30°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Basix™ and IsoLoc™
Maximum Gun Swell (in)[mm]	3.46 [87.88] @ 12.00g In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	20,000 [138]
Maximum Tensile* (lbf)[kN]	331,900 [1476.36] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA3312-5831B-**J****	12 spf [52 spm]	150°-30°	6.00	152.40	1.00	25.40	16.0 lb/ft	13.50 lb/ft

**** Total number of shots (e.g., 15' 12 SPF, 150° gun is GA3312-5381B-**J169**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
3-3/8" 12g	3112 Basix SBH *Steel Case*	EC2-31B1231	Fluid	12.0g, RDX	12 spf/150°	5-1/2" 17.0# L-80	0.71 [1.80]	5.88 [14.94]	0.66 [1.68]	4.70 [11.94]
		EC2-31B1232		12.0g, HMX						

Also available with zinc cases; P/N EC2-31C1231 (RDX) and EC2-31C1232 (HMX). Blank charge cases, 31B, steel: P/N EP-1112-100; 31C, zinc: P/N EP-1208-100-D.

PLUG AND ABANDON

Product Name	Part Number	Perforating Condition	Explosive	Shot Density and Phasing	Inner Casing	Inner Casing EH (in)[cm]	Outer Casing	Outer Casing EH (in)[cm]
3107 IsoLoc	EC2-31B0731	Fluid	7.0g, RDX	12 spf/150°-30°	5-1/2" 23.5# P110	0.51 [1.30]	7-5/8" 39# P110	No Damage

Fluid between gun and innermost casing is water. Data is based on centralized gun position; decentralized data available on request.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF
150°-30°	Carrier	C3312-J***
	Load Tube	T5831B-12-J***
All	Top Endplate	GN-EP33-6000
	Bottom Endplate	GN-EP33-6015
	Snap Rings	N5000-262 (QTY 2)
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.375 [85.73] / 0.375 [9.53]
Upper/Lower Thread Connections	2.8125" - 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001	
Top Sub, 3-3/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly Top Sub, Wireline Top Sub, Ported, SQC Connection	GN-R33-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020 GN-R33-0035 GN-R33-CQC20-A	
Top Sub Lift Sub Assembly, 3-3/8"	TC-LT33-000	
Tandem Sub, 3-3/8", Conventional and TCP	GN-R33-0021	
Ported Switch Tandem Sub Assembly, 12" long, *6.24" make-up length* Ported Switch Tandem Sub Assembly, *3.25" make-up length*	GN-R33-T150-A GN-R33-T100-A	
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R33-T150L-A GN-R33-T150R-A GN-R33-T109R-A	
Locking Ring, Left-Hand Thread Locking Ring, Right-Hand Thread	GN-R33-L001 GN-R33-R001	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-231 OR-V95G-231 OR-B231-2870
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217	
3-3/8" Bull Plug, Standard 3-3/8" Bull Plug, with 2-3/8" EUE Pin 3-3/8" Bull Plug, with 2-7/8" EUE Pin	GN-R33-0022 GN-R33-0023 GN-R33-0024	
Plug/Shoot Adapter Assembly, 3-3/8"	GN-R33-ST30	
Thread Protectors, 3-3/8" Top Sub (Top Pin) Carrier (Gun) Plastic Plug Protector Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	 GN-THD-312-020 GN-THD-338-100 GN-THD-338-030 GN-THD-338-040	

Wireline Insert
GN-E00-0011

Short Quick Change Assembly
GN-QC31-0001

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Top Sub, SQC Connection
GN-R33-CQC20-A

Top Sub
GN-R33-0020

Top Sub, Wireline
GN-R33-0035

Tandem Sub
GN-R33-0021

Switch Tandem Sub
GN-R33-T150

Switch Tandem Sub Assy
GN-R33-T100-A

Aligning Switch Sub,
LH Lock Ring
GN-R33-T150L-A

Plug/Shoot Adapter
GN-R33-ST30

Bull Plug, Standard
GN-R33-0022

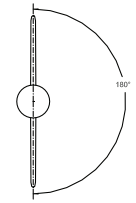
Conventional Long Guns
4 in (102 mm), 4-6 SPF, XDP

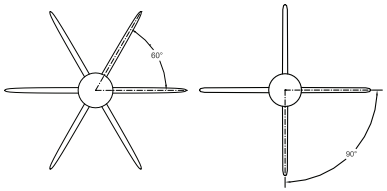
GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.16 [105.66] @ 39.0g, In Fluid





ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	19,700 [135] *(4 SPF carrier)*
Maximum Tensile* (lbf)[kN]	434,400 [1932] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number		Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
		(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
40A Charge Case	GA4004-4540A-**B****	4 spf [13 spm]	90°	7.50	190.50	3.00	76.20	22.05 lb/ft (with sub)	17.69 lb/ft (with sub)
33A/33B Charge Cases	GA4006-6033A-**A****	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80		

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, 4540A load tube with 60° (A) or 120° (G) phasing (3" shot spacing)
- 5 spf, up to 100 shots per gun, 6033A load tube with 180° (J) phasing (2.4" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
*** 4 SPF Total Number of Loadable Shots	080	056	040	024	016
*** 5 SPF Total Number of Loadable Shots	100	070	050	030	020
*** 6 SPF Total Number of Loadable Shots	120	084	060	036	024

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

DEEP PENETRATING/EXTREME DEEP PENETRATING (40A CHARGE CASE)

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	4 spf / 60°	5-1/2" 17.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX	4 spf / 60°		0.39 [0.99]	53.00 [134.62]	0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX	4 spf / 90°		0.39 [0.99]	53.00 [134.62]	0.37 [0.94]	19.10 [48.51]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX	4 spf / 60°		0.45 [1.14]	51.50 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX					0.44 [1.12]	16.30 [41.40]

DYNAMIC UNDERBALANCE PUNCHERS (40A CHARGE CASE)

Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
4"	4008 GEOPunch RDX	EC2-40A0861	8.0g, RDX	1.05 [2.67]
	4008 GEOPunch HMX	EC2-40A0862	8.0g, HMX	
	4008 GEOPunch HNS	EC2-40A0863	8.0g, HNS	

DEEP PENETRATING/EXTREME DEEP PENETRATING (33A/33B CHARGE CASES)

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4" 23g	3323 Connex SDP	EC2-33A2322-RC	Fluid	22.7g, HMX	6 spf / 60°	5-1/2" 17.0# L-80			0.46 [1.17]	15.31 [38.89]
4" 25g	3325 Razor XDP	EC2-33B2521	In Fluid or Dry	25.0g, RDX						
		EC2-33B2522		25.0g, HMX			0.47 [1.19]	46.11 [117.12]		
	3325 Basix XDP	EC2-33B2521-E	Fluid	25.0g, RDX					0.44 [1.18]	12.50 [31.75]
		EC2-33B2522-E		25.0g, HMX					0.44 [1.18]	12.70 [32.26]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF (40A)	5 SPF (33A)	6 SPF (33A)
0°	Carrier	C4004-O***		
	Load Tube	T4540A-04-O***		
60°	Carrier	C4004-A***	C4005-A***	C4006-A***
	Load Tube	T4540A-04-A***	T6033T-05C-A***	T6033T-06C-A***
90°	Carrier	C4004-B***		
	Load Tube	T4540A-04-B***		
120°	Carrier	C4004-G***		
	Load Tube	T4540A-04-G***		
180°	Carrier		C4005-J***	
	Load Tube		T6033-05T-J***	
All	Top Endplate	GN-EP40-4500	GN-EP40-6000	GN-EP40-6000
	Bottom Endplate	GN-EP40-4515	GN-EP40-6015	GN-EP40-6015
	Snap Rings	N5000-325 (QTY 2)		
	TCP Transfer Kits	GN-000-0025, GN-000-0025HT		

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.00 [101.60] / 0.375 [9.53]
Upper/Lower Thread Connections	3-7/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4"	TC-LT40-000	
Top Sub, 4" Top Sub Wireline Insert Spring Contact Assembly	GN-R40-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4"	GN-R40-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-236 OR-V95G-236 OR-B236-3497
Bull Plug, 4" Standard Bull plug, 4" with 2-3/8" EUE Pin Bull plug, 4" with 2-7/8" EUE Pin	GN-R40-0022 GN-R40-0023 GN-R40-0024	
Thread Protectors Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

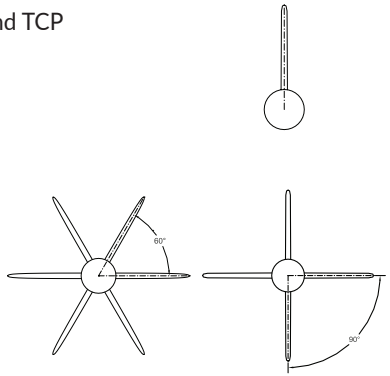
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Conventional Long Guns
4-1/2 in (114 mm), 4-6 SPF, BH, GH, XDP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	Multiple Shot Density & Phasing options
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Basix™, Razor®, and Connex®
Maximum Gun Swell (in)[mm]	4.67 [118.62] @ 39.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,700 [122]
Maximum Tensile* (lbf)[kN]	517,800 [2303] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number		Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
		(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
40A Charge Case	GA4505-4540A-**A****	5 spf [16 spm]	60°	7.20	182.88	2.40	60.96	28.7 lb/ft (w/sub)	21.2 lb/ft (w/sub)
33A/ 33B Charge Cases	GA4506-6033A-**A****	6 spf [20 spm]	60°	7.00	177.80	2.00	50.80	23.4 lb/ft (w/sub)	20.9 lb/ft (w/sub)

Additional shot and phasing options and gun lengths available by special order with lead time:

- 4 spf, up to 80 shots per gun, 4540A load tube with 60° (A) phasing (3" shot spacing)
- 5 spf, up to 100 shots per gun, 4540A load tube with 0° (O) phasing (2.4" shot spacing)
- 5 spf, up to 100 shots per gun, 6033A load tube with 60° (A) phasing (2.4" shot spacing)

Available Gun Lengths	21'	15'	11'	7'	5'
*** 4 SPF Total Number of Loadable Shots	080	056	040	024	016
*** 5 SPF Total Number of Loadable Shots	100	070	050	030	020
*** 6 SPF Total Number of Loadable Shots	120	084	060	036	024

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
4-1/2 in (114 mm), 4-6 SPF, BH, GH, XDP

GEODynamics®

BIG HOLE (40A CHARGE CASE)

Carrier O.D. *(tested)*	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 39g	4039 Basix BH	EC2-40A3931	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80	0.86 [2.18]	6.13 [15.57]		
		EC2-40A3932		39.0g, HMX						

DEEP PENETRATING/EXTREME DEEP PENETRATING (40A CHARGE CASE)

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX			0.44 [1.12]	58.59 [148.82]	0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX			0.45 [1.14]	72.93 [185.24]	0.37 [0.94]	19.10 [48.51]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX			0.45 [1.14]	51.5 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX			0.44 [1.12]	51.97 [132.00]	0.44 [1.12]	16.30 [41.40]

DYNAMIC UNDERBALANCE PUNCHERS (40A CHARGE CASE)

Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
4-1/2"	4008 GEOPunch RDX	EC2-40A0861	8.0g, RDX	1.05 [2.67]
	4008 GEOPunch HMX	EC2-40A0862	8.0g, HMX	
	4008 GEOPunch HNS	EC2-40A0863	8.0g, HNS	

DEEP PENETRATING/EXTREME DEEP PENETRATING (33A/33B CHARGE CASES)

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 23g	3323 Connex SDP	EC2-33A2321-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	7.0"			0.34 [0.86]	14.75 [37.47]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	10.50 [26.67]
4-1/2" 25g	3325 Razor XDP	EC2-33B2521	In Fluid or Dry	25.0g, RDX	6 spf / 60°	7.0"			0.44 [1.12]	16.30 [41.40]
		EC2-33B2522		25.0g, HMX					0.34 [0.86]	15.70 [39.88]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-1/2 in (114 mm), 4-6 SPF, BH, GH, XDP

GOOD HOLE (33A CHARGE CASES)

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 23g	3323 Connex XEH	EC2-33A2341-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	7.0"			0.34 [0.86]	14.72 [37.39]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	4 SPF (40A)	5 SPF (40A)	5 SPF (33A)	6 SPF (33A)
0°	Carrier		C4505-O***		
	Load Tube		T4540A-05-O***		
60°	Carrier	C4504-A***	C4505-A***	C4505-A***	C4506-A***
	Load Tube	T4540A-04-A***	T4540A-05-A***	T6033T-05-A***	T6033W-06-A***
	Tube Centralizers				GN-W4520
All	Top Endplate	GN-EP45-4500		GN-EP45-6000	
	Bottom Endplate	GN-EP45-4515		GN-EP45-6015	
	Snap Rings	N5000-375 (QTY 2)			
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT			

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.50 [114.30] / 0.375 [9.53]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

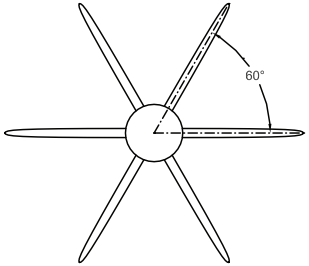
Conventional Long Guns
4-1/2 in (114 mm), 17 SPM

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	17 SPM (60°); Available Gun Lengths range from 1 to 7 meters
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.67 [118.62] @ 39.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,700 [122]
Maximum Tensile* (lbf)[kN]	517,800 [2303] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	# Shots	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Gun Lengths	Approximate Weights	
		spm	*Phasing*	*(mm)*	*(in)*	*(mm)*	*(in)*	*(m)*	*(kg)*	*(lbs)*
GM4517-4540A-A017	17	17 spm	60°	190	7.48	60.6061	2.38606	1.35	39.6	87
GM4517-4540A-A034	34			175	6.89			2.35	67.1	148
GM4517-4540A-A050	50			190	7.48			3.35	94.8	209
GM4517-4540A-A067	67			175	6.89			4.35	122.4	270
GM4517-4540A-A083	83			190	7.48			5.35	150.0	331
GM4517-4540A-A100	100			175	6.89			6.35	177.6	392
GM4517-4540A-A116	116			190	7.48			7.35	205.3	453

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-1/2 in (114 mm), 17 SPM

BIG HOLE

Carrier O.D. *(tested)*	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 39g	4039 Basix BH	EC2-40A3931	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80	0.86 [2.18]	6.13 [15.57]		
		EC2-40A3932		39.0g, HMX						

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX			0.44 [1.12]	58.59 [148.82]	0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX			0.45 [1.14]	72.93 [185.24]	0.37 [0.94]	19.10 [48.51]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX			0.45 [1.14]	51.5 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX			0.44 [1.12]	51.97 [132.00]	0.44 [1.12]	16.30 [41.40]

DYNAMIC UNDERBALANCE PUNCHERS

Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
4-1/2"	4008 GEOPunch RDX	EC2-40A0861	8.0g, RDX	1.05 [2.67]
	4008 GEOPunch HMX	EC2-40A0862	8.0g, HMX	
	4008 GEOPunch HNS	EC2-40A0863	8.0g, HNS	

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	17 SPM (40A)
60°	Carrier	CM45N17-A***
	Load Tube	TM4540A-N17-A***
All	Top Endplate	GN-EP45-4500
	Bottom Endplate	GN-EP45-4515
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** *Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster-to-booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.50 [114.30] / 0.375 [9.53]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

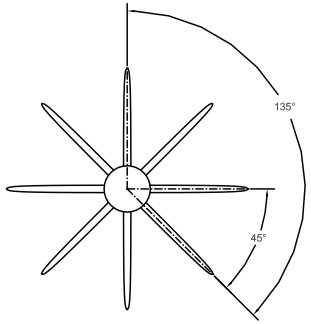
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Conventional Long Guns
4-1/2 in (114 mm), 12 SPF, BH and XDP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	12 SPF (135-45)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.69 [119.13] @ 22.7g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,200 [118]
Maximum Tensile* (lbf)[kN]	517,800 [2303] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4512-5033A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	26.4 lb/ft (w/sub)	20.4 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 12SPF, 135-45 phased gun is GA4512-5033A-**C241**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
4-1/2 in (114 mm), 12 SPF, BH and XDP

BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	12 spf/135°-45°	7.0" 32.0# L-80	0.81 [2.06]	5.28 [13.41]	0.78 [1.98]	5.00 [12.70]
		EC2-33A2332		22.7g, HMX					0.80 [2.03]	5.30 [13.46]

For this application, 33A charges must have the grooved charge case, EP-1000-100-D.

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	12 spf / 135°-45°	7.0" 32.0# L-80				
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.43 [1.09]	15.70 [39.88]
		EC2-33A2322		22.7g, HMX			0.38 [0.97]	34.90 [88.65]		

For this application, 33A charges must have the grooved charge case, EP-1000-100-D.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (33A Case)
135°-45°	Carrier	C4512-C***
	Load Tube	T5033A-12-C***
All	Top Endplate	GN-EP45-5000
	Bottom Endplate	GN-EP45-5015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** *Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.50 [114.30] / 0.375 [9.53]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8”	TC-LT45-000H	
Top Sub, 4-1/2” Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2”	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2” Standard 4-1/2” with 2-7/8” EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

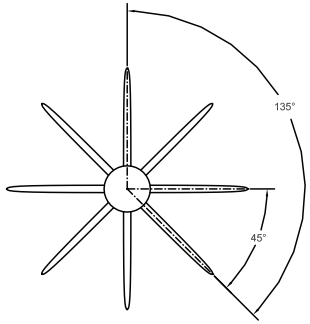
Spring Contact Assembly
GN-E00-0011
(4-1/2” OD top sub shown for reference only)

Conventional Long Guns
4-1/2 in (114 mm), 12 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	12 SPF (135-45)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.81 [122.17] @ 26.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,200 [118]
Maximum Tensile* (lbf)[kN]	517,800 [2303] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4512-4046A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	23.8 lb/ft (w/sub)	20.5 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 12SPF, 135-45 phased gun is GA4512-4046A-**C241**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-1/2 in (114 mm), 12 SPF, SBH

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 26g	4526 Basix SBH TL *Steel Case*	EC2-45B2631	Fluid	26.0g, RDX	12 spf/135°-45°	7.0" 32.0# L-80	0.87 [2.21]	5.67 [14.40]		
		EC2-45B2632		26.0g, HMX	16 spf/ 140°-20°		0.93 [2.36]	5.77 [14.66]		

Maximum shot density in 4-1/2" carrier is 12 spf. Charge cases 45B, 46A, 46B with 26g load are compatible with 4-1/2" carrier and 4046A load tube.
Charge cases 45A & 46A are zinc; charge cases 45B & 46B are steel. Blank charge case P/N: EP-1085-100-D (4-1/2" BH LD, zinc).

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (45A/B, 46A/B Case)
135°-45°	Carrier	C4512-C***
	Load Tube	TH4045A-12-C***
All	Top Endplate	GN-EP45-H4009
	Bottom Endplate	GN-EP45-H4015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.50 [114.30] / 0.375 [9.53]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

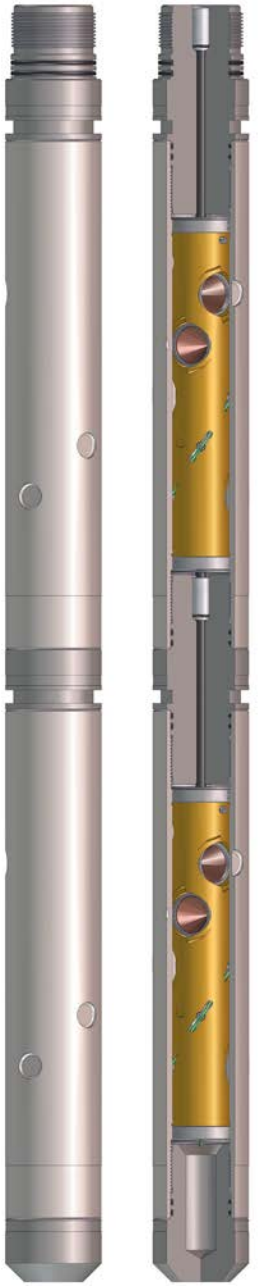
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

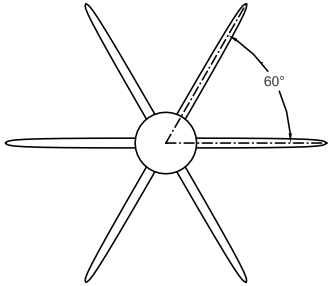
Conventional Long Guns
4-5/8 in (117 mm), 5 SPF, BH and XDP, Standard and High-Pressure

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing	5 SPF (60°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.816 [122.33] @ 39.0g, In Fluid



ENVIRONMENTAL

	Standard	High Pressure
Maximum Pressure (psi)[MPa]	18,900 [130]	25,000 [172] @ 250°F
Maximum Tensile* (lbf)[kN]	*454,600 [2022]	*454,600 [2022]

**Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4605-4540A-**A*** **	5 spf [16 spm]	60°	7.20	183	2.40	60.96	32.5 lb/ft (w/sub)	25.0 lb/ft (w/sub)
GA4605-4540A-**A*****-HP**	5 spf [16 spm]	60°	7.20	183	2.40	60.96	32.7 lb/ft (w/sub)	25.2 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 5 SPF, 60° phased gun is GA4605-4540A-**A100;** high-pressure with same phasing is GA4605-4540A-**A100-HP**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 5 SPF Total Number of Loadable Shots	100	070	050	030	020

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-5/8 in (117 mm), 5 SPF, BH and XDP, Standard and High-Pressure

GEODynamics®

BIG HOLE

Carrier O.D. *(tested)*	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-1/2" 39g	4039 Basix BH	EC2-40A3931	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80	0.86 [2.18]	6.13 [15.57]		
		EC2-40A3932		39.0g, HMX						

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. *Application*	Performance in Concrete		Performance in Stressed Berea	
							EHD *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-5/8" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	5 spf / 60°	7.0" 32.0# L-80			0.41 [1.04]	17.15 [43.56]
		EC2-40A3922-RC		39.0g, HMX					0.43 [1.09]	17.80 [45.21]
		EC2-40A3923-RC		39.0g, HNS					0.36 [0.91]	15.20 [38.61]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX					0.38 [0.97]	18.60 [47.24]
		EC2-40A3922		39.0g, HMX					0.37 [0.94]	19.10 [48.51]
		EC2-40A3923		39.0g, HNS					0.33 [0.84]	16.40 [41.66]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX			0.45 [1.14]	51.5 [130.81]	0.56 [1.42]	16.10 [40.89]
		EC2-40A3922-E		39.0g, HMX					0.44 [1.12]	16.30 [41.40]

DYNAMIC UNDERBALANCE PUNCHERS

Carrier O.D.	Product Name	Part Number	Explosive	Exit Hole *(in)[cm]*
4-5/8"	4008 GEOPunch RDX	EC2-40A0861	8.0g, RDX	1.05 [2.67]
	4008 GEOPunch HMX	EC2-40A0862	8.0g, HMX	
	4008 GEOPunch HNS	EC2-40A0863	8.0g, HNS	

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	5 SPF Standard	5 SPF High-Pressure
60°	Carrier	C4605-A***	C4605-A***-HP
	Load Tube	T4540A-05-A***	T4540A-05-A***-HP
All	Top Endplate	GN-EP45-4500	
	Bottom Endplate	GN-EP45-4515	
	Snap Rings	N5000-375 (QTY 2)	
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT	

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.625 [117.48] / 0.4375 [11.11]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

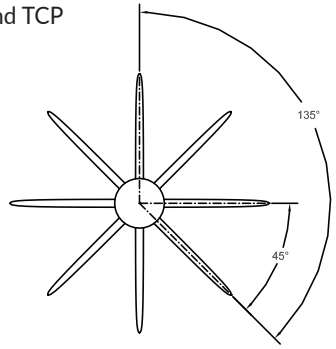
Conventional Long Guns
4-5/8 in (117 mm), 12 SPF, XDP

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®
Maximum Gun Swell (in)[mm]	4.69 [119.13] @ 22.7g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	18,900 [130]
Maximum Tensile* (lbf)[kN]	454,600 [2022] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4612-5033A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	29.4 lb/ft (w/sub)	23.4 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 12 SPF, 135°-45° phased gun is GA4612-5033A-***C241***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Revised: August 20, 2025 12:34 PM

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-5/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	12 spf / 135°-45°	7.0" 32.0# L-80				
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX						
		EC2-33A2322		22.7g, HMX			0.37 [0.94]	35.03 [88.98]		

For this application, 33A charges must have the grooved charge case, EP-1000-100-D.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (33A Case)
135°-45°	Carrier	C4612-C***
	Load Tube	T5033A-12-C***
All	Top Endplate	GN-EP45-5000
	Bottom Endplate	GN-EP45-5015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.625 [117.48] / 0.4375 [11.11]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

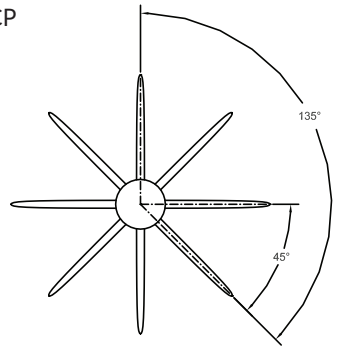
Conventional Long Guns
4-5/8 in (117 mm), 12 SPF, SBH

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	4.81 [122.17] @ 26.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	18,900 [130]
Maximum Tensile* (lbf)[kN]	454,600 [2022] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4612-4045A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	26.8 lb/ft (w/sub)	23.5 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 12 SPF, 135°-45° phased gun is GA4612-4054A-***C241***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-5/8 in (117 mm), 12 SPF, SBH

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
4-5/8" 26g	4626 Razor SBH TL LD *Zinc Case*	[1] EC2-46A2631	Fluid	26.0g, RDX	16 spf/ 140°-20°	7.0" 32.0# L-80	0.90 [2.29]	5.50 [13.97]		
		[1] EC2-46A2632		26.0g, HMX						
		[1] EC2-46A2631		26.0g, RDX		7-3/4" 46.1# C-110	0.96 [2.44]	5.40 [13.72]		
	4526 Basix SBH TL *Steel Case*	EC2-45B2631		26.0g, RDX		7.0" 32.0# L-80	0.94 [2.39]	6.27 [15.93]		
		EC2-45B2632		26.0g, HMX						
	4626 Basix SBH TL *Steel Case*	[1] EC2-46B2631		26.0g, RDX			0.94 [2.39]	6.27 [15.93]		
		[1] EC2-46B2632		26.0g, HMX						

Charge cases 45A & 46A are zinc; charge cases 45B & 46B are steel. [1]Blank charge case P/N: EP-1085-100-D (4-1/2" BH LD, zinc).

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (45A/B, 46A/B Case)
135°-45°	Carrier	C4612-C***
	Load Tube	TH4045A-12-C***
All	Top Endplate	GN-EP45-H4009
	Bottom Endplate	GN-EP45-H4015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.625 [117.48] / 0.4375 [11.11]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

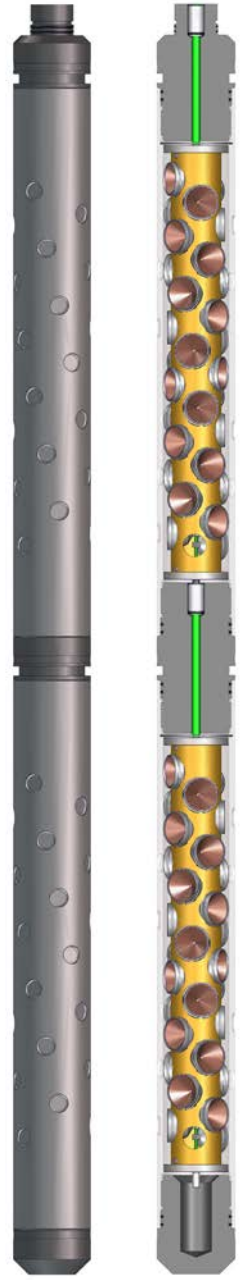
Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
4-5/8 in (117 mm), 16 SPF, SBH, Standard and High-Pressure

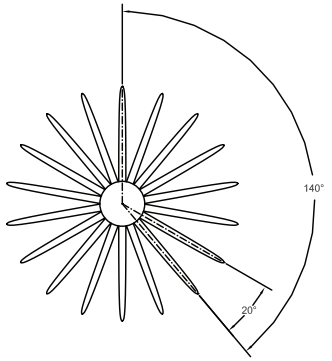
GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing	16 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	4.81 [122.17] @ 26.0g, In Fluid



ENVIRONMENTAL

	Standard	High Pressure
Maximum Pressure (psi)[MPa]	18,900 [130]	20,000 [138] @ 235°F
Maximum Tensile* (lbf)[kN]	454,600 [2022]	465,300 [2069]

**Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
Standard: GA4616-4045A-**D***	16 spf [52 spm]	140°-20°	6.00	152.40	0.75	19.05	27.4 lb/ft (w/sub)	22.9 lb/ft (w/sub)
High Pressure: GA4616-4045A-**D*****-HP**	16 spf [52 spm]	140°-20°	6.00	152.40	0.75	19.05	27.4 lb/ft (w/sub)	22.9 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 16 SPF, 140°-20° phased high-pressure gun is GA4616-4045A-***D321-HP***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 16 SPF Total Number of Loadable Shots	321	225	161	097	049

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-5/8 in (117 mm), 16 SPF, SBH, Standard and High-Pressure

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
4-5/8" 26g	4626 Razor SBH TL LD *Zinc Case*	[1] EC2-46A2631	Fluid	26.0g, RDX	16 spf/ 140°-20°	7.0" 32.0# L-80	0.90 [2.29]	5.50 [13.97]		
		[1] EC2-46A2632		26.0g, HMX						
		[1] EC2-46A2631		26.0g, RDX		7-3/4" 46.1# C-110	0.96 [2.44]	5.40 [13.72]		
	4526 Basix SBH TL *Steel Case*	EC2-45B2631		26.0g, RDX		7.0" 32.0# L-80	0.94 [2.39]	6.27 [15.93]		
		EC2-45B2632		26.0g, HMX						
	4626 Basix SBH TL *Steel Case*	[1] EC2-46B2631		26.0g, RDX			0.94 [2.39]	6.27 [15.93]		
		[1] EC2-46B2632		26.0g, HMX						

Charge cases 45A & 46A are zinc; charge cases 45B & 46B are steel. [1]Blank charge case P/N: EP-1085-100-D (4-1/2" BH LD, zinc).

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	16 SPF Standard	16 SPF High-Pressure
135°-45°	Carrier	C4616-D***	C4616-D***-HP
	Load Tube	T4045A-16-D***	T4045A-16-D***
All	Top Endplate	GN-EP45-H4009	
	Bottom Endplate	GN-EP45-H4015	
	Snap Rings	N5000-375 (QTY 2)	
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT	

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.625 [117.48] / 0.4375 [11.11]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Revised: August 20, 2025 12:34 PM

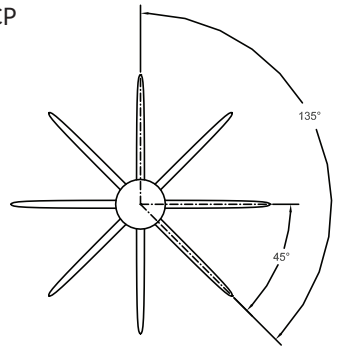
Patents: www.oilstatesintl.com/patents

Conventional Long Guns
4-3/4 in (121 mm), 12 SPF, XDP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®
Maximum Gun Swell (in)[mm]	4.867 [123.62] @ 22.7g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	25,000 [172] @ 260°F
Maximum Tensile* (lbf)[kN]	454,600 [2022] *Hardware Calculated Breaking Point

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4712-5033A-C***-HP	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	37.0 lb/ft (w/sub)	31.0 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 12 SPF, 135°-45° phased gun is GA4712-5033A-***C241-HP***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-3/4 in (121 mm), 12 SPF, XDP

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-5/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	12 spf / 135°-45°	7.0" 32.0# L-80				
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX						
		EC2-33A2322		22.7g, HMX			0.37 [0.94]	35.03 [88.98]		

For this application, 33A charges must have the grooved charge case, EP-1000-100-D.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (33A Case)
135°-45°	Carrier	C4712-C***-HP
	Load Tube	T5033A-12-C***
All	Top Endplate	GN-EP45-5003
	Bottom Endplate	GN-EP45-5015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.75 [120.65] / 0.50 [12.7]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

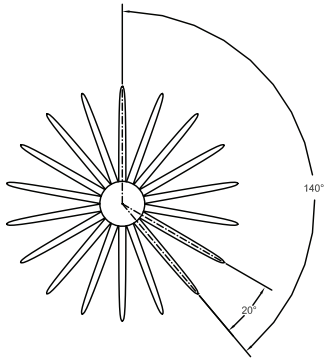
Conventional Long Guns
4-3/4 in (121 mm), 16 SPF, SBH

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	16 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®, Basix™
Maximum Gun Swell (in)[mm]	4.828 [122.63] @ 26.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	23,000 [158.6] @ 260°F
Maximum Tensile* (lbf)[kN]	454,600 [2022] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4716-4045A-**D*****	16 spf [52 spm]	140°-20°	6.00	152.40	0.75	19.05	35.60 lb/ft (w/sub)	31.0 lb/ft (w/sub)

**** Total number of shots, e.g., 21' 16 SPF, 140°-20° phased gun is GA4716-4045A-***D321***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 16 SPF Total Number of Loadable Shots	321	225	161	097	049

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-3/4" 26g	4626 Razor SBH TL LD *Zinc Case*	[1] EC2-46A2631	Fluid	26.0g, RDX	16 spf/ 140°-20°	7.0" 32.0# L-80	0.90 [2.29]	5.50 [13.97]		
		[1] EC2-46A2632		26.0g, HMX						
		[1] EC2-46A2631		26.0g, RDX		7-3/4" 46.1# C-110	0.96 [2.44]	5.40 [13.72]		
	4526 Basix SBH TL *Steel Case*	EC2-45B2631		26.0g, RDX		7.0" 32.0# L-80	0.94 [2.39]	6.27 [15.93]		
		EC2-45B2632		26.0g, HMX						
	4626 Basix SBH TL *Steel Case*	[1] EC2-46B2631		26.0g, RDX			0.94 [2.39]	6.27 [15.93]		
		[1] EC2-46B2632		26.0g, HMX						

Charge cases 45A & 46A are zinc; charge cases 45B & 46B are steel. [1]Blank charge case P/N: EP-1085-100-D (4-1/2" BH LD, zinc).

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	16 SPF (45A/B, 46A/B Case)
135°-45°	Carrier	C4716-D***
	Load Tube	T4045A-16-D***
All	Top Endplate	GN-EP45-H4009
	Bottom Endplate	GN-EP45-H4015
	Snap Rings	N5000-375 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.75 [120.65] / 0.50 [12.70]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Sub Lift Sub Assembly, 4-5/8"	TC-LT45-000H	
Top Sub, 4-1/2" Top Sub Wireline Insert Spring Contact Assembly	GN-R45-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020	
Tandem Sub, 4-1/2"	GN-R45-0021	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-342 OR-V95G-342 OR-B342-3997
Bull Plug, 4-1/2" Standard 4-1/2" with 2-7/8" EUE Pin	GN-R45-0022 GN-R45-0023	
Thread Protectors, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

Wireline Insert
GN-E00-0011

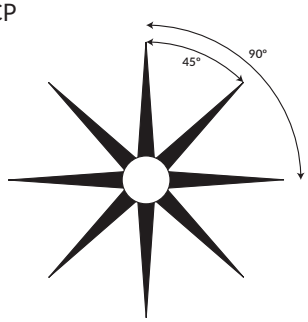
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Conventional Long Guns
4-3/4 in (121 mm), 24 SPF, HPHF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	24 SPF (90°-45°) 90° planar, 45° between planes
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	4.81 [122.17] In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	30,000 [207]
Maximum Tensile* (lbf)[kN]	688,000 [3060] *Hardware Calculated Break Point

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Shot to Shot Distance Across Tandem		Distance Between Planes		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA4724-3548K-**N***	24 spf [79 spm]	90°-45°	7.00	177.80	16.90	429.26	2.0	50.80	33.40 lb/ft	25.80 lb/ft

**** Total number of shots (e.g., 15' 24 SPF, 90° gun is GA4724-3548K-**N336**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 24 SPF Total Number of Loadable Shots	480	336	240	144	072

Contact Joey Prestenbach,
Global Technical Advisor
Joey.Prestenbach@perf.com
for more information about this system

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
4-3/4 in (121 mm), 24 SPF, HPHF, SBH

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
4-3/4" 18g	4818 Razor SBH *Steel Case*	EC2-48K1831	Fluid	18.0g, RDX	24 spf/ 90°-45°	7.0" 31.7# L-80				
		EC2-48K1832		18.0g, HMX			0.73 [1.85]	4.81 [12.22]		
						† 7-3/4" 45.51# Q-125	0.63 [1.60]	3.70 [9.40]		

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	24 SPF (48K Case)
135°-45°	Carrier	C475350-100-N***
	Load Tube	T3548K-24-N***
All	Top Endplate	GN-EP475-3500
	Bottom Endplate	GN-EP475-3515
	Snap Rings	N5000-350 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** *Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	4.75 [120.65] / 0.625 [15.88]
Upper/Lower Thread Connections	3-15/16" - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-V95G-230 OR-B230-2813	Gun Connection OR-V95G-342 OR-B342-3997
Lift Sub Assembly, Tandem, 4-1/2"	TC-LT45-000H	
Lifting Clamp Assembly, 4.75"	TC-LC-04750-0000	
Top Sub, 4-3/4" Top Sub Wireline Insert; Spring Contact Assembly	GN-R475-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 4-3/4"	GN-R475-0021	
Bull Plugs, 4-3/4" Standard 4-3/4" with 2-7/8" EUE Pin Finned Centralizing Bull Plug, 4.75" OD x 6.25"	GN-R475-0022 GN-R475-0023 GN-R47523-C625	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-450-030 GN-THD-450-040	

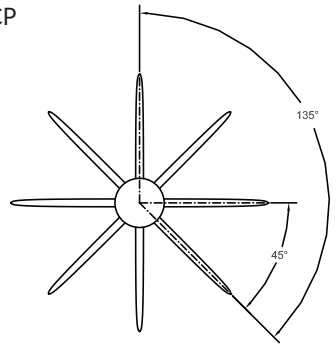
Conventional Long Guns
5-1/8 in (130 mm), 12 SPF, XDP

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®, Basix™, (23g max.; grooved charge case required)
Maximum Gun Swell (in)[mm]	5.34 [135.64] @ 19.0g in Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,200 [118.59]
Maximum Tensile* (lbf)[kN]	461,800 [2054] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA5112-5033A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	31.0 lb/ft	25.0 lb/ft

**** Total number of shots (e.g., 15' 12 SPF, 135° gun is GA5112-5033A-**C169**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Conventional Long Guns
5-1/8 in (130 mm), 12 SPF, XDP

GEODynamics®

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
5-1/8" 23g	3323 Razor XDP	EC2-33A2321	Fluid	† 22.7g, RDX	12 spf / 135°-45°	7-5/8"				
		EC2-33A2322		† 22.7g, HMX					0.38 [0.97]	12.60 [32.00]
	3323 Basix XDP	EC2-33A2321-E	Fluid	† 22.7g, RDX	12 spf / 135°-45°	7-5/8" 33.7# L-80	0.38 [0.97]	28.10 [71.37]		
		EC2-33A2322-E		† 22.7g, HMX						

† 33A charge case must be grooved. For 5-1/8" 12 spf, max. explosive load is 22.7g.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (33A Case)
135°-45°	Carrier	C5112-C***
	Load Tube	T5033A-12T-C***
All	Top Endplate	GN-EP51-5000
	Bottom Endplate	GN-EP51-5015
	Snap Rings	N5000-425 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	5.125 [130.18] / 0.4375 [11.11]
Upper/Lower Thread Connections	4.500 in. - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-346 OR-V95G-346 OR-B346-4559
Top Sub Lift Sub Assembly, 5-1/8"	TC-LT51-000H	
Top Sub, 5-1/8" Top Sub Wireline Insert; Spring Contact Assembly	GN-R51-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 5-1/8"	GN-R51-0021	
Bull Plugs, 5-1/8" Standard 5-1/8" with 2-7/8" EUE Pin Centralized Bull Plug, 5-1/8" with 6-1/4" O.D	GN-R51-0022 GN-R51-0023 GN-R5122-C625	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-512-030 GN-THD-512-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

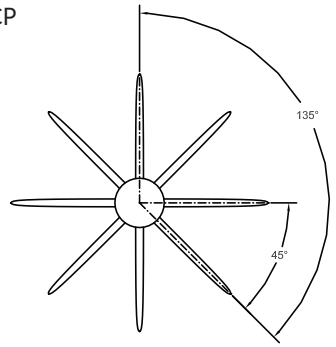
Conventional Long Guns
5-1/8 in (130 mm), 12 SPF, SBH

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	5.33 [135.38] @ 32.0g In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,200 [118.59]
Maximum Tensile* (lbf)[kN]	461,800 [2054] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA5112-3551A-**C***	12 spf [39 spm]	135°-45°	6.00	152.40	1.00	25.40	29.0 lb/ft	25.0 lb/ft

**** Total number of shots (e.g., 15' 12 SPF, 135° gun is GA5112-3551A-**C169**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	241	169	121	073	037

Conventional Long Guns
5-1/8 in (130 mm), 12 SPF, SBH

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
5-1/8" 32g	5132 Razor SBH TL LD *Zinc Case*	EC2-51A3231	Fluid	32.0g, RDX	16 spf / 140°-20°	7-5/8" 33.7# L-80	1.07 [2.72]	6.60 [16.76]		
		EC2-51A3232		32.0g, HMX						
	5132 Razor SBH LD *Steel Case*	EC2-51B3231		32.0g, RDX	12 spf/135°-45°		1.05 [2.67]	7.08 [17.98]		
				32.0g, RDX	16 spf / 140°-20°		1.05 [2.67]	6.88 [17.48]		

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (51A/B Case)
140°-20°	Carrier	C5112-C***
	Load Tube	TH3551A-12-C***
All	Top Endplate	GN-EP51-H3500
	Bottom Endplate	GN-EP51-H3515
	Snap Rings	N5000-425 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist lock charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	5.125 [130.18] / 0.4375 [11.11]
Upper/Lower Thread Connections	4.500 in. - 6P ACME-2G

COMPONENTS AND ACCESSORIES

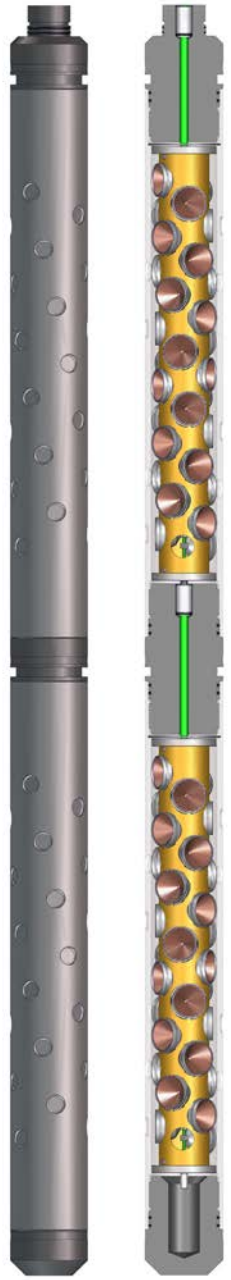
Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-346 OR-V95G-346 OR-B346-4559
Top Sub Lift Sub Assembly, 5-1/8"	TC-LT51-000H	
Top Sub, 5-1/8" Top Sub Wireline Insert; Spring Contact Assembly	GN-R51-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 5-1/8"	GN-R51-0021	
Bull Plugs, 5-1/8" Standard 5-1/8" with 2-7/8" EUE Pin Centralized Bull Plug, 5-1/8" with 6-1/4" O.D	GN-R51-0022 GN-R51-0023 GN-R5122-C625	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-512-030 GN-THD-512-040	

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

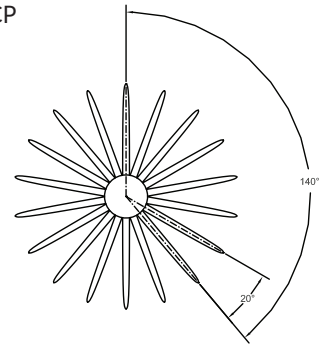
Conventional Long Guns
5-1/8 in (130 mm), 16 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	16 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	5.33 [135.38] @ 32.0g In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	17,200 [118.59]
Maximum Tensile* (lbf)[kN]	461,800 [2054] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA5116-3551A-**D***	16 spf [52 spm]	140°-20°	6.00	152.40	0.75	19.05	30.08 lb/ft	25.10 lb/ft

**** Total number of shots (e.g., 15' 16 SPF, 140° gun is GA5116-3551A-***D225***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 16 SPF Total Number of Loadable Shots	321	225	161	097	049

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
5-1/8 in (130 mm), 16 SPF, SBH

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D. Application	Performance in Concrete EHD (in)[cm]	Performance in Concrete TTP (in)[cm]	Performance in Stressed Berea EHD^ (in)[cm]	Performance in Stressed Berea TTP (in)[cm]
5-1/8" 32g	5132 Razor SBH TL LD *Zinc Case*	EC2-51A3231	Fluid	32.0g, RDX	16 spf / 140°-20°	7-5/8" 33.7# L-80	1.07 [2.72]	6.60 [16.76]		
		EC2-51A3232		32.0g, HMX						
	5132 Razor SBH LD *Steel Case*	EC2-51B3231		32.0g, RDX	12 spf/135°-45°		1.05 [2.67]	7.08 [17.98]		
				32.0g, RDX	16 spf / 140°-20°		1.05 [2.67]	6.88 [17.48]		

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	16 SPF (51A/B Case)
140°-20°	Carrier	C5116-D***
	Load Tube	T3551A-16-D***
All	Top Endplate	GN-EP51-H3509
	Bottom Endplate	GN-EP51-H3515
	Snap Rings	N5000-425 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist lock charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	5.125 [130.18] / 0.4375 [11.11]
Upper/Lower Thread Connections	4.500 in. - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-230	OR-N569-346
Viton (with back-up rings required for > 325°F)	OR-V95G-230	OR-V95G-346
Back-up rings for > 325°F	OR-B230-2813	OR-B346-4559
Top Sub Lift Sub Assembly, 5-1/8"	TC-LT51-000H	
Top Sub, 5-1/8"	GN-R51-0020	
Top Sub Wireline Insert; Spring Contact Assembly	GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 5-1/8"	GN-R51-0021	
Bull Plugs, 5-1/8" Standard	GN-R51-0022	
5-1/8" with 2-7/8" EUE Pin	GN-R51-0023	
Centralized Bull Plug, 5-1/8" with 6-1/4" O.D	GN-R5122-C625	
Thread Protector, Top Sub (Top Pin)	GN-THD-312-020	
Carrier (Gun) Protector	GN-THD-512-030	
Tandem Sub & Bull Plug Protector	GN-THD-512-040	

Wireline Insert
GN-E00-0011

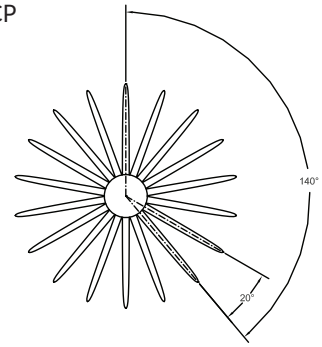
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Conventional Long Guns
5-1/8 in (130 mm), 22 SPF, GH and DP

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	22 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Basix™ and Razor® (19g max.; grooved charge case required)
Maximum Gun Swell (in)[mm]	5.34 [135.64] @ 19.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	15,400 [106.18]
Maximum Tensile* (lbf)[kN]	461,800 [2054] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA5122-5033A-**D*****	22 spf [72 spm]	140°-20°	6.00	152.40	0.5454	13.85	36.4 lb/ft	25.0 lb/ft

**** Total number of shots (e.g., 15' 22 SPF, 140° gun is GA5122-5033A-***D309***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 22 SPF Total Number of Loadable Shots	441	309	221	133	067

Conventional Long Guns
5-1/8 in (130 mm), 22 SPF, GH and DP

GEODynamics®

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
5-1/8" 19g	3319 Razor GH	EC2-33A1941-G	Fluid	† 19.0g, RDX	22 spf / 140°-20°	7-5/8"			0.37 [0.94]	12.10 [30.73]
	3319 Basix GH	EC2-33A1941-EG		† 19.0g, RDX			0.37 [0.94]	25.20 [64.01]		

† 33A charge case must be grooved. For 5-1/8" 22 spf, max. explosive load is 19g.

DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
5-1/8"	3319 Basix DP	EC2-33A1921-EG	Fluid	† 19.0g, RDX	22 spf / 140°-20°	7-5/8" 33.7# L-80	0.36 [0.91]	26.30 [66.80]		

† 33A charge case must be grooved. For 5-1/8" 22 spf, max. explosive load is 19g.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	22 SPF (33A Case)
135°-45°	Carrier	C5122-D***
	Load Tube	T5033A-22INT-D***
All	Top Endplate	GN-EP51-5000
	Bottom Endplate	GN-EP51-5015
	Snap Rings	N5000-425 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

**** Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	5.125 [130.18] / 0.4375 [11.11]
Upper/Lower Thread Connections	4.500 in. - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-346 OR-V95G-346 OR-B346-4559
Top Sub Lift Sub Assembly, 5-1/8"	TC-LT51-000H	
Top Sub, 5-1/8" Top Sub Wireline Insert; Spring Contact Assembly	GN-R51-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 5-1/8"	GN-R51-0021	
Bull Plugs, 5-1/8" Standard 5-1/8" with 2-7/8" EUE Pin Centralized Bull Plug, 5-1/8" with 6-1/4" O.D	GN-R51-0022 GN-R51-0023 GN-R5122-C625	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-512-030 GN-THD-512-040	

Wireline Insert
GN-E00-0011

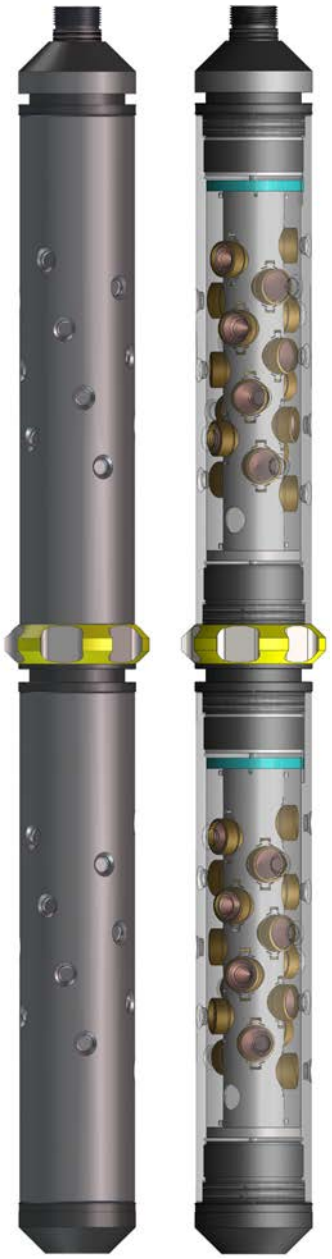
Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Revised: August 20, 2025 12:34 PM

ECLIPSE™ SGH
6-5/8 in (168 mm), 15 SPF, SGH

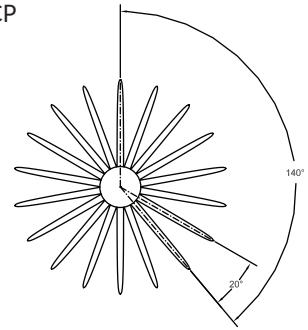
GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	15 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	ECLIPSE™ SGH
Maximum Gun Swell (in)[mm]	6.75" [171.45] @ 45g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	18,700 [128.93] @ 265° F
Maximum Tensile* (lbf)[kN]	944,400 [4201] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA6615-3040A-**D*****	15 spf [49 spm]	140°-20°	7.60	193.04	0.80	20.32		48 lb/ft

**** Total number of shots (e.g., 11' 15 SPF, 140° gun is GA6615-3040A-***D147***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 15 SPF Total Number of Loadable Shots	297	207	147	087	042

ECLIPSE™ SGH
6-5/8 in (168 mm), 15 SPF, SGH

GEODynamics®

SUPER GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
6.625" 45g	6625 ECLIPSE, SGH 66S, *Steel Case*	EC2-66S4551	Fluid	45g, RDX	15 spf / 140°-20°	9-5/8" 47# L-80	0.87 [2.21]	15.00 [38.10]		
		EC2-66S4552		45g, HMX						
		EC2-66S4553		45g, HNS						

66S SGH charges also available with zinc cases (e.g., EC2-66SZ4551). Contact your sales representative for additional testing services.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	15 SPF (66S (40A) Case)
140°-20°	Carrier	C6615-D***
	Load Tube	T3040A-15T-D***
All	Top Endplate	GN-EP66-3009
	Bottom Endplate	GN-EP66-3015
	Snap Rings	N5000-525 (QTY 2)
	TCP Transfer Kits	GN-000-0036, GN-000-0036HT

*** Total number of shots*

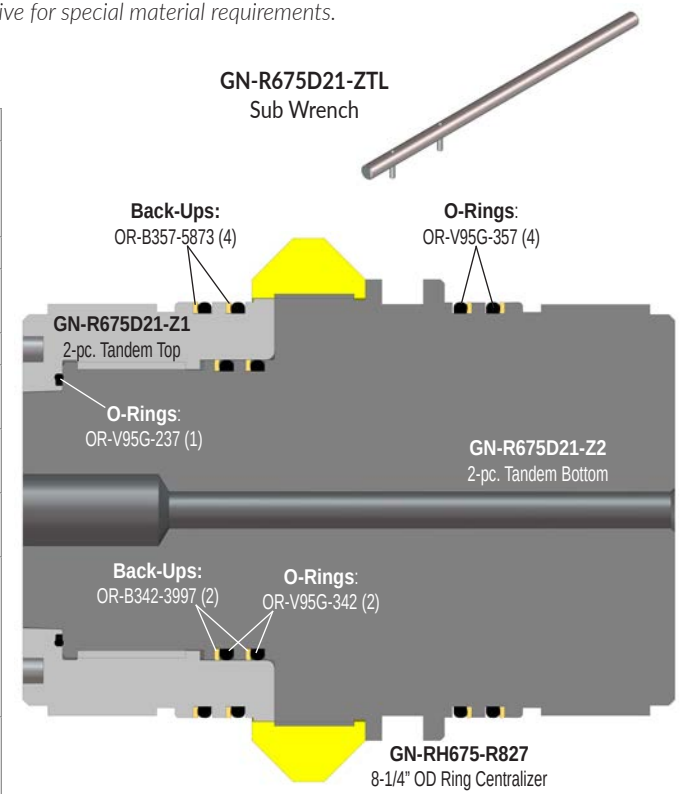
HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	6.625 [168] / 0.593 [15]*
Upper/Lower Thread Connections	5.75 in. - 6P ACME-2G

**Contact your sales representative for special material requirements.*

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-V95G-230 OR-B230-2813	Gun Connection OR-V95G-357 OR-B357-5873
Lift Sub Assembly, Tandem, 4-1/2"	TC-LT45-000H *(threads into bottom part of 2-piece tandem)*	
Top Sub, 6-3/4" Top Sub Wireline Insert; Spring Contact Assembly	GN-R675D20 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Two Piece Tandem 6-3/4" w/8-1/4" Centralizing Ring	GN-R675D21-Z827-CT	
Two Piece Tandem 6-3/4" (Top) GN-R675D21-Z1 (o-rings: OR-V95G-237, OR-V95G-357; back-up rings: OR-B357-5873)		
Two Piece Tandem 6-3/4" (Bottom) GN-R675D21-Z2 (o-rings: OR-V95G-342, OR-V95G-357; back-up rings: OR-B342-3997, OR-B357-5873)		
Centralizing Ring 6-3/4" (8.270" OD) Sub Wrench	GN-RH675-R827 GN-R675D21-ZTL	
Bull Plugs, 6-3/4" Standard 6-3/4" with 2-7/8" EUE Pin 6-3/4" with 3-1/2" EUE Pin Centralized with 2-7/8" EUE Pin Centralized with 3-1/2" EUE Pin	GN-R675D22 GN-R675D23 GN-R675D24 GN-R675D23-C825 GN-R675D24-C825	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-675-030 GN-THD-675-040	



Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

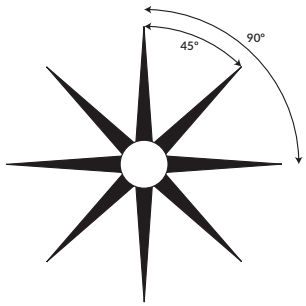
Conventional Long Guns
6-3/4 in (171 mm), 22 SPF, HPHF, SBH

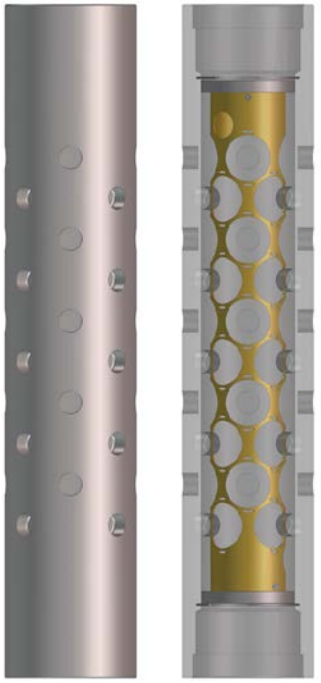
GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	22 SPF (90°-45°) 90° planar, 45° between planes
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor® Super Big Hole
Maximum Gun Swell (in)[mm]	6.83 [173.48] @ 52.0g, In Fluid





ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	30,000 [207]
Maximum Tensile* (lbf)[kN]	1,229,000 [5466] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Shot to Shot Distance Across Tandem		Distance Between Planes		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA6722-2068K-**N*****	22 spf [72 spm]	90°-45°	8.18 *5ft and longer guns*	207.77	19.26	489.20	2.19	55.63	76.70 lb/ft	60.20 lb/ft

**** Total number of shots (e.g., 15' 22 SPF, 90° gun is GA6722-2068K-***N304***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 22 SPF Total Number of Loadable Shots	436	304	216	128	060

Contact Joey Prestenbach,
Global Technical Advisor
Joey.Prestenbach@perf.com
for more information about this system

Revised: August 20, 2025 12:34 PM

Conventional Long Guns
6-3/4 in (171 mm), 22 SPF, HPHF, SBH

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
6-3/4" 52g	6852 Razor SBH *Steel Case*	EC2-68K5231	Fluid	52.0g, RDX	22 spf/ 90°-45°	9-5/8" 46.18# L-80				
		EC2-68K5232		52.0g, HMX			1.08 [2.74]	5.62 [14.27]		
						9-7/8" 61.80# Q-125	0.97 [2.46]	5.35 [13.59]		

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	22 SPF (68K Case)
90°-45°	Carrier	C675HP22-N***
	Load Tube	T2068K-22-N***
All	Top Endplate	GN-EP675-2000
	Bottom Endplate	GN-EP675-2015
	Snap Rings	N5000-500 (QTY 2)
	TCP Transfer Kits	GN-000-0035, GN-000-0035HT

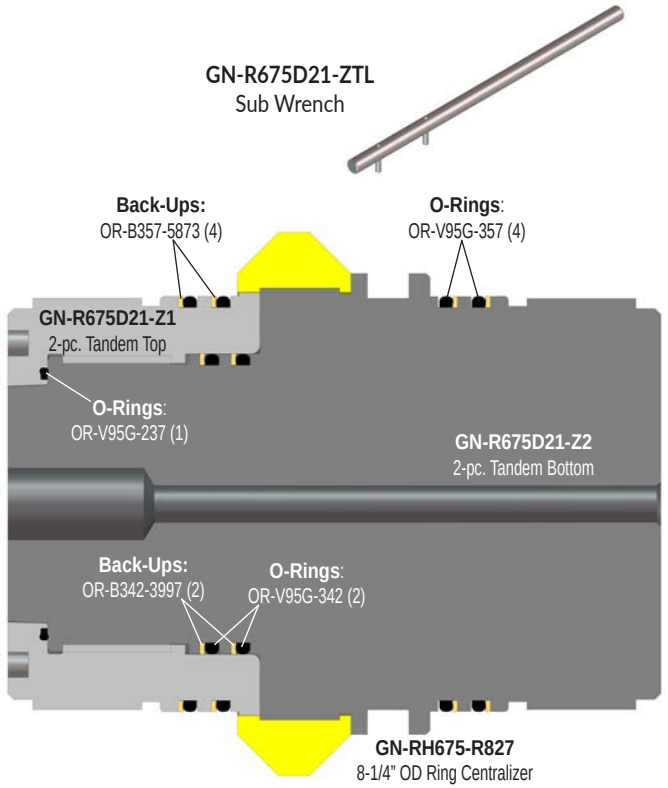
*** *Total number of shots*

HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	6.75 [171] / 0.875 [22.23]
Upper/Lower Thread Connections	5.75 in. - 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-V95G-230 OR-B230-2813	Gun Connection OR-V95G-357 OR-B357-5873
Lift Sub Assembly, Tandem, 4-1/2"	TC-LT45-000H *(threads into bottom part of 2-piece tandem)*	
Top Sub, 6-3/4" Top Sub Wireline Insert; Spring Contact Assembly	GN-R675D20 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Two Piece Tandem 6-3/4" w/8-1/4" Centralizing Ring	GN-R675D21-Z827-CT	
Two Piece Tandem 6-3/4" (Top) GN-R675D21-Z1 (o-rings: OR-V95G-237, OR-V95G-357; back-up rings: OR-B357-5873)		
Two Piece Tandem 6-3/4" (Bottom) GN-R675D21-Z2 (o-rings: OR-V95G-342, OR-V95G-357; back-up rings: OR-B342-3997, OR-B357-5873)		
Centralizing Ring 6-3/4" (8.270" OD) Sub Wrench	GN-RH675-R827 GN-R675D21-ZTL	
Bull Plugs, 6-3/4" Standard 6-3/4" with 2-7/8" EUE Pin 6-3/4" with 3-1/2" EUE Pin Centralized with 2-7/8" EUE Pin Centralized with 3-1/2" EUE Pin	GN-R675D22 GN-R675D23 GN-R675D24 GN-R675D23-C825 GN-R675D24-C825	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-675-030 GN-THD-675-040	

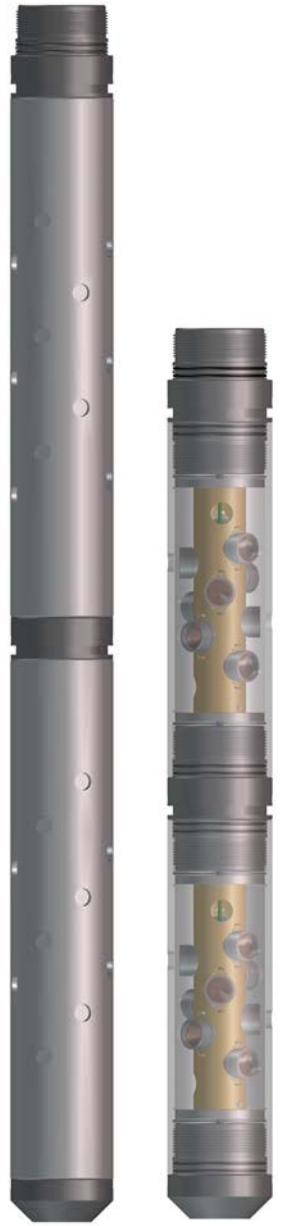


Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

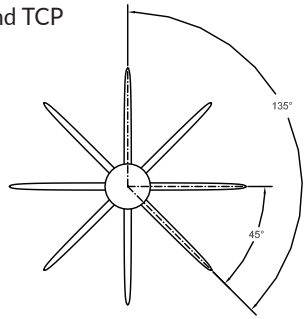
Conventional Long Guns
7 in (178 mm), 12 SPF, DP, GH, PWC, SGH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Connex®, Razor®, Basix™, Bullseye™, ECLIPSE™
Maximum Gun Swell (in)[mm]	7.28 [184.91] @ 39.0g



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	13,500 [93]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
Standard: GA7012-3040A-**C***	12 spf [39 spm]	135°-45°	7.50	190.50	1.0	25.40	49.14 lb/ft	42.25 lb/ft

**** Total number of shots (e.g., 11' 12 SPF, 135° DP gun is GA7012-3040A-**C118**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	238	166	118	070	034

Conventional Long Guns
7 in (178 mm), 12 SPF, DP, GH, PWC, SGH

GEODynamics®

PERF, WASH, AND CEMENT

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Casing O.D.	Performance in Concrete	
						Application	**Avg. EHD** *(in)[cm]*	**Avg. Penetration** *(in)[cm]*
7" 39g	4039 Bullseye SGH, RDX 40A, *Steel Case*	EC2-40S3991	Fluid	39.0g, RDX	12 spf / 135° - 45°	9-5/8", 53.5# L-80	0.61 [1.55]	23.4 [59.44]
						9-5/8", 53.5# P-110	0.59 [1.50]	
						9-5/8", 53.5# HCG-125	0.55 [1.40]	
						13-3/8", 72# L-80	0.51 [1.30]	17.6 [44.70]
						13-3/8", 72# P-110	0.48 [1.22]	
						13-3/8", 72# HCG-125	0.43 [1.09]	

Above data is based on centralized gun position and a general selection of casing options. Charges are available in RDX, HMX, and HNS, and also with zinc cases (e.g., EC2-40SZ3991).

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" 39g	4039 Connex SDP	EC2-40A3921-RC	Fluid	39.0g, RDX	12 spf / 135°-45°	9-5/8" 47.0# L-80			0.46 [1.17]	16.50 [41.91]
		EC2-40A3922-RC		39.0g, HMX					0.42 [1.07]	17.50 [44.45]
	4039 Razor XDP	EC2-40A3921		39.0g, RDX					0.38 [0.97]	16.90 [42.93]
		EC2-40A3922		39.0g, HMX			0.41 [1.04]	53.59 [136.12]	0.44 [1.12]	17.65 [44.83]
	4039 Basix XDP	EC2-40A3921-E		39.0g, RDX					0.50 [1.27]	15.70 [39.88]
		EC2-40A3922-E		39.0g, HMX						

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" 39g	4039 Basix GH	EC2-40A3941	Fluid	39.0g, RDX	12 spf / 135°-45°	9-5/8" 47.0# L-80	0.80 [2.03]	15.42 [39.17]		

SUPER GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" 45g	4045 Razor SGH 40A, *Steel Case*	EC2-40S4551	Fluid	45g, RDX	12 spf / 135°-45°	9-5/8" 47# L-80	0.90 [2.29]	22.01 [55.91]		
		EC2-40S4552		45g, HMX						
		EC2-40S4553		45g, HNS						

SGH charges available with 39 gram and 45 gram explosive loads, and with zinc cases (e.g., EC2-40SZ3951, EC2-40SZ4551). Contact your sales representative for additional testing services.

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (40A Case)
135°-45°	Carrier	C7012-C***
	Load Tube	T3040A-12-C***
All	Top Endplate	GN-EP70-3009
	Bottom Endplate	GN-EP70-3015
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

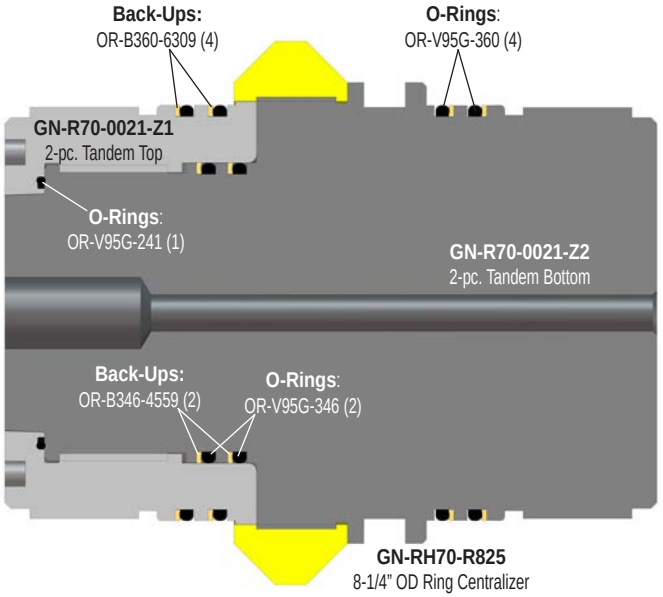
HARDWARE SPECIFICATIONS

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.00 [178] / 0.50 [12.7]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	



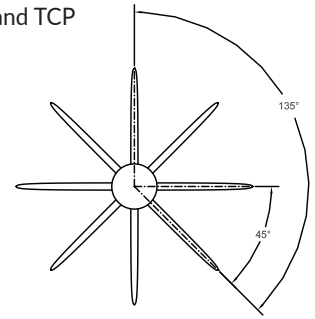
GN-R70-0021-ZTL
Sub Wrench

Conventional Long Guns
7 in (178 mm), 12 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	12 SPF (135°-45°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	7.15 [181.61] @ 52.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	13,500 [93]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
Standard: GA7012-2070C-**C***	12 spf [39 spm]	135°-45°	7.50	190.50	1.0	25.40	49.14 lb/ft	42.25 lb/ft

**** Total number of shots (e.g., 11' 12 SPF, 135° SBH gun is GA7012-2070C-**C118**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 12 SPF Total Number of Loadable Shots	238	166	118	070	034

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039 Razor SBH TL LD *Zinc Case*	EC2-70C3931	Fluid	39.0g, RDX	15 spf / 140°-20°	9-5/8" 47.0# L-80	1.24 [3.15]	7.08 [17.98]		
7.11" only 52g	7052 Razor SBH TL LD *Zinc Case*	EC2-70C5231		52.0g, RDX			1.39 [3.53]	6.50 [16.51]		
						10-1/8" 79.75# SM-125S	1.12 [2.84]	6.60 [16.76]		

HMX charges also available: EC2-70C3932 and EC2-70C5232. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

DUAL CASING SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing		*Penetration
						OD/Wt/ Material	Exit Hole *(in)[cm]*	OD/Wt/ Material	Exit Hole *(in)[cm]*	*(in)[cm]*
7.11" 52g	7052 Razor Dual Casing SBH 70D, *Steel Case*	EC2-70D5231-DU	Fluid	52g, RDX	15 spf / 140°-20°	9-7/8" 62.8# Q-125	0.75 [1.91]	11-7/8" 71.8# Q-125	0.63 [1.60]	10.00 [25.40]
		EC2-70D5232-DU		52g, HMX		9-7/8" 62.8# Q-125	0.76 [1.93]	11-7/8" 71.8# Q-125	0.64 [1.63]	10.60 [26.92]

**Coupon tests; penetration through cement target. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.*

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	12 SPF (70C Case)
135°-45°	Carrier	C7012-C***
	Load Tube	T2070C-12-C***
All	Top Endplate	GN-EP70-2009
	Bottom Endplate	GN-EP70-2015
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

**** Total number of shots*

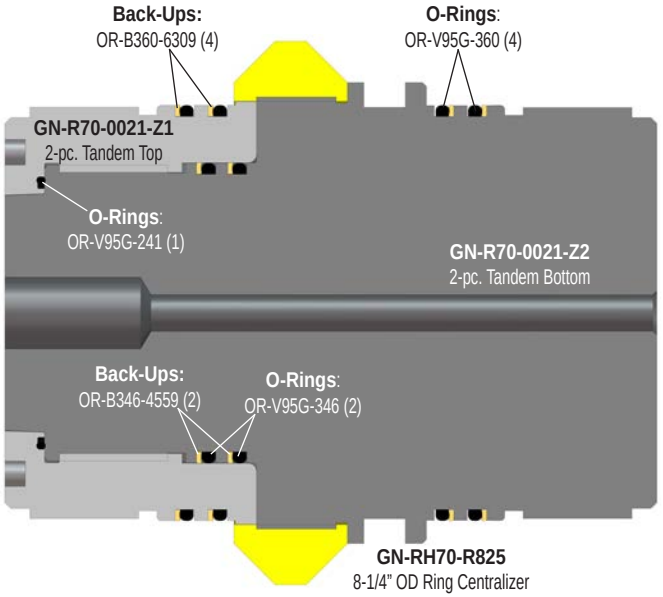
HARDWARE SPECIFICATIONS

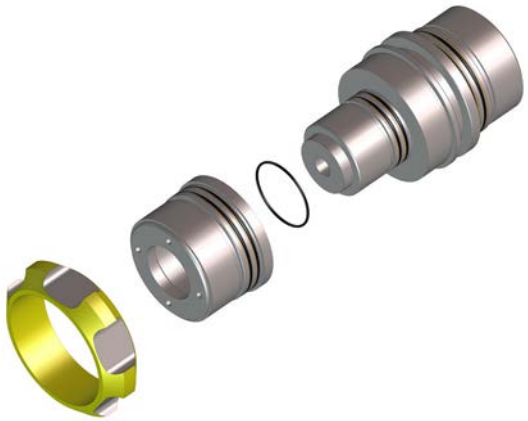
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.00 [178] / 0.50 [12.7]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench

GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

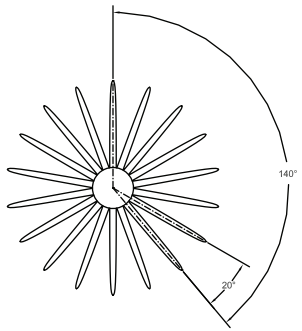
Conventional Long Guns
7 in (178 mm), 15 SPF, SBH, Standard and High Pressure

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	15 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	7.23 [183.64] @ 52.0g, In Fluid



ENVIRONMENTAL

	Standard	High Pressure
Maximum Pressure (psi)[MPa]	13,500 [93]	14,600 [100]
Maximum Tensile* (lbf)[kN]	770,700 [3,428]	770,700 [3,428]

**Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
Standard: GA7015-2070C-**D***	15 spf [49 spm]	140°-20°	7.60	193.04	0.80	20.32	50.87 lb/ft	42.25 lb/ft
High Pressure: GA7015-2070C-**D*****-HP**	15 spf [49 spm]	140°-20°	7.60	193.04	0.80	20.32	50.87 lb/ft	42.25 lb/ft

**** Total number of shots (e.g., 11' 15 SPF, 140° gun is GA7015-2070C-***D147***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 15 SPF Total Number of Loadable Shots	297	207	147	087	042

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Long Guns
7 in (178 mm), 15 SPF, SBH, Standard and High Pressure

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039 Razor SBH TL LD *Zinc Case*	EC2-70C3931	Fluid	39.0g, RDX	15 spf / 140°-20°	9-5/8" 47.0# L-80	1.24 [3.15]	7.08 [17.98]		
7.11" only 52g	7052 Razor SBH TL LD *Zinc Case*	EC2-70C5231		52.0g, RDX			1.39 [3.53]	6.50 [16.51]		
						10-1/8" 79.75# SM-125S	1.12 [2.84]	6.60 [16.76]		

HMX charges also available: EC2-70C3932 and EC2-70C5232. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	15 SPF Standard	15 SPF High-Pressure
140°-20°	Carrier	C7015-D***	C7015-D***-HP
	Load Tube	T2070C-15-D***	T2070C-15-D***
All	Top Endplate	GN-EP70-2009	
	Bottom Endplate	GN-EP70-2015	
	Snap Rings	N5000-600 (QTY 2)	
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT	

*** Total number of shots*

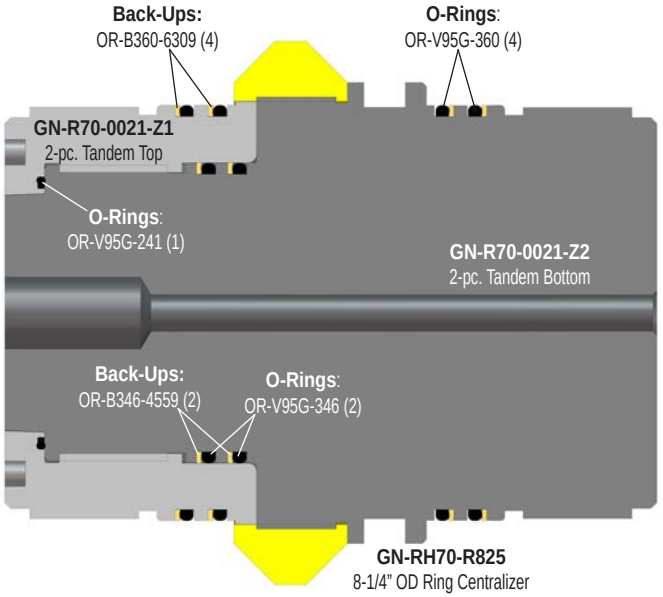
HARDWARE SPECIFICATIONS

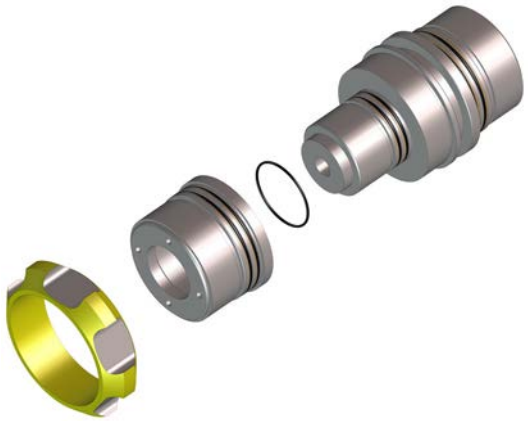
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.00 [178] / 0.50 [12.7]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

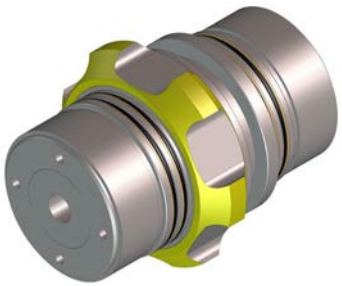
COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench



GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

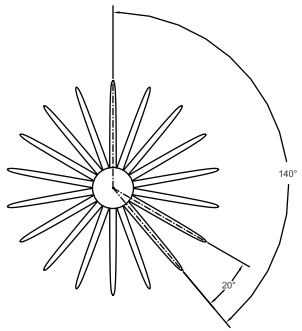
Conventional Long Guns
7.11 in (181 mm), 15 SPF, SBH

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	15 SPF (140°-20°)
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	Razor®
Maximum Gun Swell (in)[mm]	7.23 [183.64] @ 52.0g, In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	13,500 [93]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Breaking Point*

**Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Shot to Shot		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
Standard: GA7115-2070C-**D****	15 spf [49 spm]	140°-20°	7.60	193.04	0.80	20.32	54.12 lb/ft	45.50 lb/ft

**** Total number of shots (e.g., 11' 15 SPF, 140° gun is GA7115-2070C-**D147**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 15 SPF Total Number of Loadable Shots	297	207	147	087	042

Conventional Long Guns
7.11 in (181 mm), 15 SPF, SBH

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039 Razor SBH TL LD *Zinc Case*	EC2-70C3931	Fluid	39.0g, RDX	15 spf / 140°-20°	9-5/8" 47.0# L-80	1.24 [3.15]	7.08 [17.98]		
7.11" only 52g	7052 Razor SBH TL LD *Zinc Case*	EC2-70C5231		52.0g, RDX			1.39 [3.53]	6.50 [16.51]		
						10-1/8" 79.75# SM-125S	1.12 [2.84]	6.60 [16.76]		

HMX charges also available: EC2-70C3932 and EC2-70C5232. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

DUAL CASING SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing		*Penetration
						OD/Wt/ Material	Exit Hole *(in)[cm]*	OD/Wt/ Material	Exit Hole *(in)[cm]*	*(in)[cm]*
7.11" 52g	7052 Razor Dual Casing SBH 70D, *Steel Case*	EC2-70D5231-DU	Fluid	52g, RDX	15 spf / 140°-20°	9-7/8" 62.8# Q-125	0.75 [1.91]	11-7/8" 71.8# Q-125	0.63 [1.60]	10.00 [25.40]
		EC2-70D5232-DU		52g, HMX		9-7/8" 62.8# Q-125	0.76 [1.93]	11-7/8" 71.8# Q-125	0.64 [1.63]	10.60 [26.92]

**Coupon tests; penetration through cement target. 52-gram applications with shot densities 15 spf and higher require 7.11" OD material.*

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	15 SPF
140°-20°	Carrier	C7115-D***
	Load Tube	T2070C-15-D***
All	Top Endplate	GN-EP70-2009
	Bottom Endplate	GN-EP70-2015
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

**** Total number of shots*

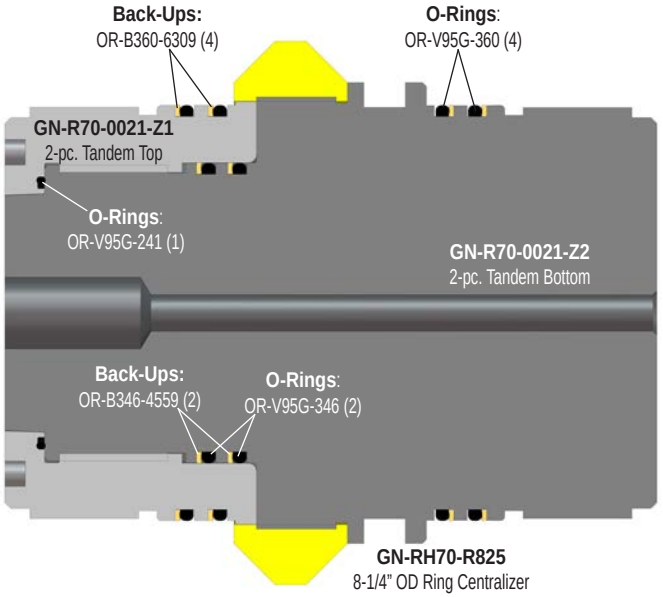
HARDWARE SPECIFICATIONS

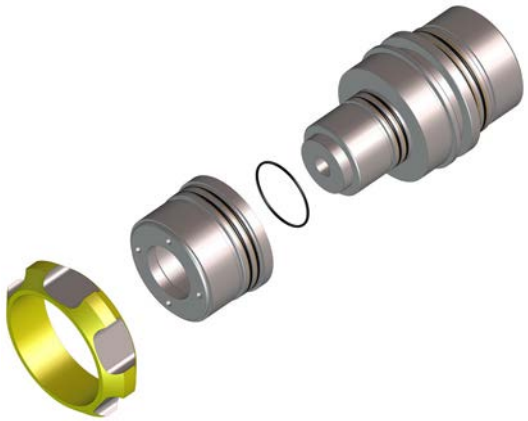
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, twist-lock retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.11 [181] / 0.56 [14.2]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

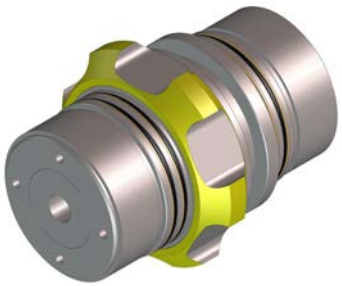
COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench



GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

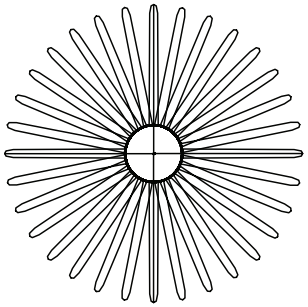
ECLIPSE™ SBH
7 in (178 mm), 18 SPF, SBH, 360° Channel Finder

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	18 SPF (90°) rotated cluster 11.25° spiral
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	ECLIPSE™
Maximum Gun Swell (in)[mm]	7.22 [183.39] In Fluid @ 52.0g
Perforation Area Open to Flow	360° coverage in 9-5/8" casing



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	11,500 [79]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Between Planes		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA7018-1870K-**Q****	18 spf [59 spm]	90° Planar 11.25° Spiral	4' guns = 8.00	203.20	2.67	67.82	55.94 lb/ft	34.27 lb/ft
			7'-21' guns = 7.333	186.18				

*** Total number of shots (e.g., 15' 18 SPF, 90° gun is GA7018-1870K-**Q252**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 18 SPF Total Number of Loadable Shots	360	252	180	108	052

ECLIPSE™ SBH
7 in (178 mm), 18 SPF, SBH, 360° Channel Finder

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039K ECLIPSE SBH *Steel Case*	EC2-70K3931	Fluid	39.0g, RDX	20 spf / 90°-45°	9-5/8" 47.0# L-80	1.04 [2.64]	6.31 [16.03]	1.10 [2.79]	4.40 [11.18]
		EC2-70K3932		39.0g, HMX					1.18 [3.00]	4.60 [11.68]
7.11" only 52g	7052K ECLIPSE SBH *Steel Case*	EC2-70K5231		52.0g, RDX		9-5/8" 47.0# L-80	1.41 [3.58]	5.67 [14.40]		
		EC2-70K5232		52.0g, HMX		9-5/8" 53.5# L-80	1.42 [3.61]	7.06 [17.93]		

52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	18 SPF (70K Case)
90° Planar 11.25° Spiral	Carrier	C7018-Q***
	Load Tubes	T1870K-18-Q*** and T4070K-18-Q***
All	Top Endplate	GN-EP70-1800K
	Bottom Endplate	GN-EP70-1815K
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** *Total number of shots*

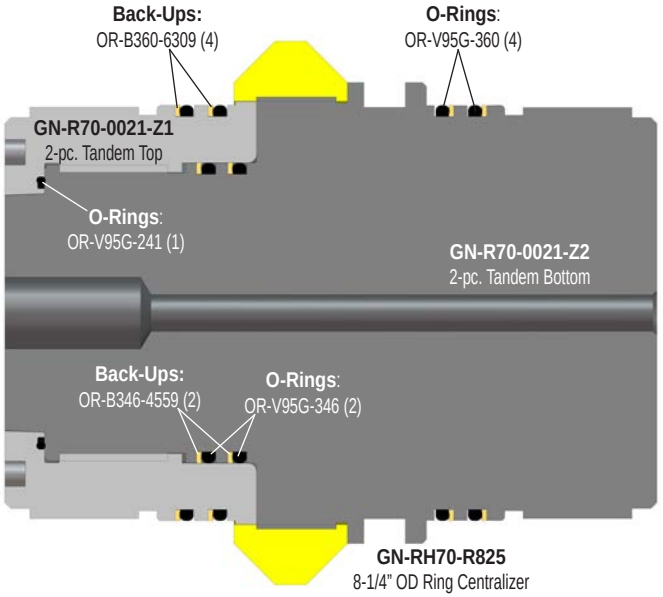
HARDWARE SPECIFICATIONS

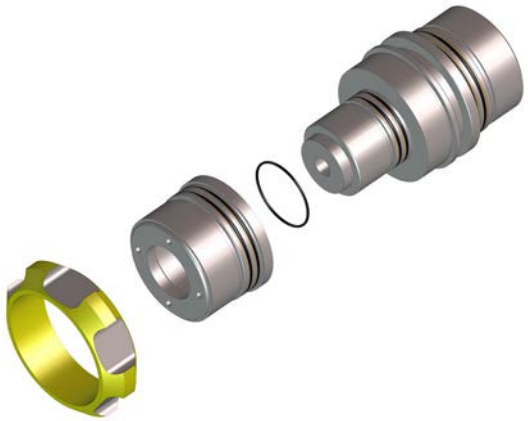
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.00 [178] / 0.50 [12.7]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench

GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

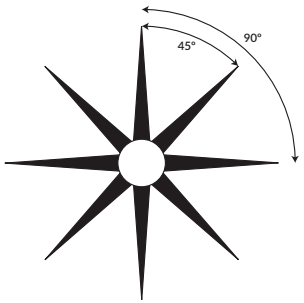
ECLIPSE™ SBH
7 in (178 mm), 20 SPF, SBH

GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	20 SPF (90°-45°) 90° planar, 45° between planes
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	ECLIPSE™
Maximum Gun Swell (in)[mm]	7.22 [183.39] In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	11,500 [79]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Between Planes		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA7020-1870K-**N*** **	20 spf [66 spm]	90°-45°	8.40	213.36	2.40	60.96	55.94 lb/ft	34.27 lb/ft
GA7020-1870K-**N*****HP**	20 spf [66 spm]	90°-45°	8.40	213.36	2.40	60.96		

**** Total number of shots (e.g., 15' 20 SPF, 90° gun is GA7020-1870K-**N276**.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 20 SPF Total Number of Loadable Shots	396	276	196	116	056

ECLIPSE™ SBH
7 in (178 mm), 20 SPF, SBH

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039K ECLIPSE SBH *Steel Case*	EC2-70K3931	Fluid	39.0g, RDX	20 spf / 90°-45°	9-5/8" 47.0# L-80	1.04 [2.64]	6.31 [16.03]	1.10 [2.79]	4.40 [11.18]
		EC2-70K3932		39.0g, HMX					1.18 [3.00]	4.60 [11.68]
7.11" only 52g	7052K ECLIPSE SBH *Steel Case*	EC2-70K5231		52.0g, RDX		9-5/8" 47.0# L-80	1.41 [3.58]	5.67 [14.40]		
		EC2-70K5232		52.0g, HMX		9-5/8" 53.5# L-80	1.42 [3.61]	7.06 [17.93]		

52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	20 SPF (70K Case)
90°-45°	Carrier	C7020-N*** / C7020-N***-HP
	Load Tubes	T1870K-20-N*** and T4070K-20-N***
All	Top Endplate	GN-EP70-1800K
	Bottom Endplate	GN-EP70-1815K
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

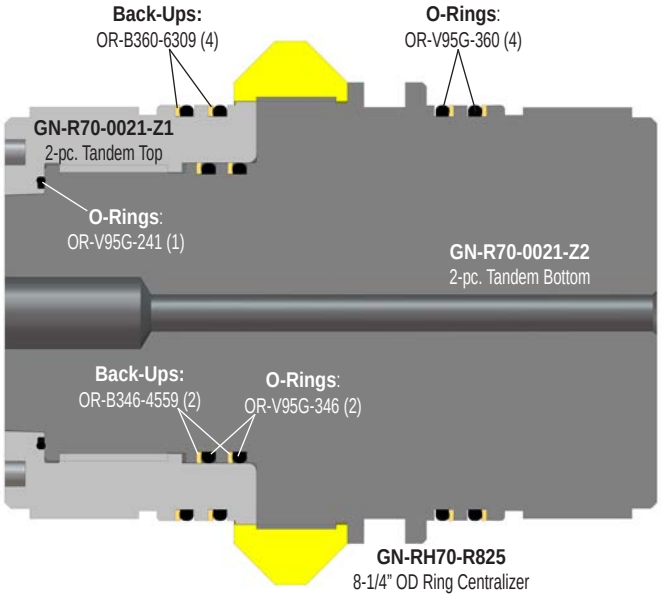
HARDWARE SPECIFICATIONS

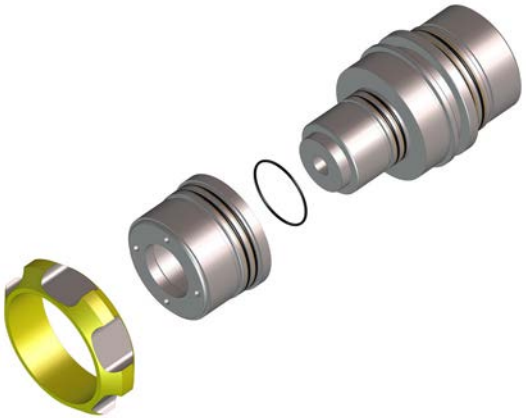
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.00 [178] / 0.50 [12.7]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

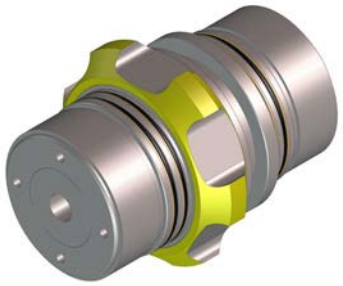
COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench



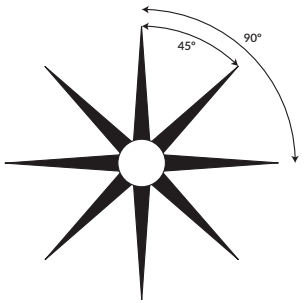
GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

ECLIPSE™ SBH
7.11 in (181 mm), 20 SPF, SBH

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	20 SPF (90°-45°) 90° planar, 45° between planes
Initiation Point	Top- or bottom-fired options available; conventional wireline and TCP
Mode of Fire	Simultaneous or selective fire
Detonating Cord	80-grain round
Compatible Perforating Charges	ECLIPSE™
Maximum Gun Swell (in)[mm]	7.22 [183.39] In Fluid



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	11,500 [79]
Maximum Tensile* (lbf)[kN]	770,700 [3,428] **Hardware Calculated Break Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot Density & Phasing		Gun End to Center of First Scallop		Distance Between Planes		Approximate Weights	
	(spf) [spm]	*Phasing*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Fully Loaded*	*Blank Gun*
GA7120-1870K-**N*****	20 spf [66 spm]	90°-45°	8.40	213.36	2.40	60.96	59.04 lb/ft	37.37 lb/ft

**** Total number of shots (e.g., 15' 20 SPF, 90° gun is GA7120-1870K-***N276***.*

Additional gun lengths available by special order with lead time:

Available Gun Lengths	21'	15'	11'	7'	4'
*** 20 SPF Total Number of Loadable Shots	396	276	196	116	056

ECLIPSE™ SBH
7.11 in (181 mm), 20 SPF, SBH

GEODynamics®

SUPER BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
7" or 7.11" 39g	7039K ECLIPSE SBH *Steel Case*	EC2-70K3931	Fluid	39.0g, RDX	20 spf / 90°-45°	9-5/8" 47.0# L-80	1.04 [2.64]	6.31 [16.03]	1.10 [2.79]	4.40 [11.18]
		EC2-70K3932		39.0g, HMX					1.18 [3.00]	4.60 [11.68]
7.11" only 52g	7052K ECLIPSE SBH *Steel Case*	EC2-70K5231		52.0g, RDX		9-5/8" 47.0# L-80	1.41 [3.58]	5.67 [14.40]		
		EC2-70K5232		52.0g, HMX		9-5/8" 53.5# L-80	1.42 [3.61]	7.06 [17.93]		

52-gram applications with shot densities 15 spf and higher require 7.11" OD material.

INTERNAL CARRIER ASSEMBLY HARDWARE

Phasing	Description	20 SPF (70K Case)
90°-45°	Carrier	C7120-N***
	Load Tubes	T1870K-20-N*** and T4070K-20-N***
All	Top Endplate	GN-EP70-1800K
	Bottom Endplate	GN-EP70-1815K
	Snap Rings	N5000-600 (QTY 2)
	TCP Transfer Kits	GN-000-0030, GN-000-0030HT

*** Total number of shots*

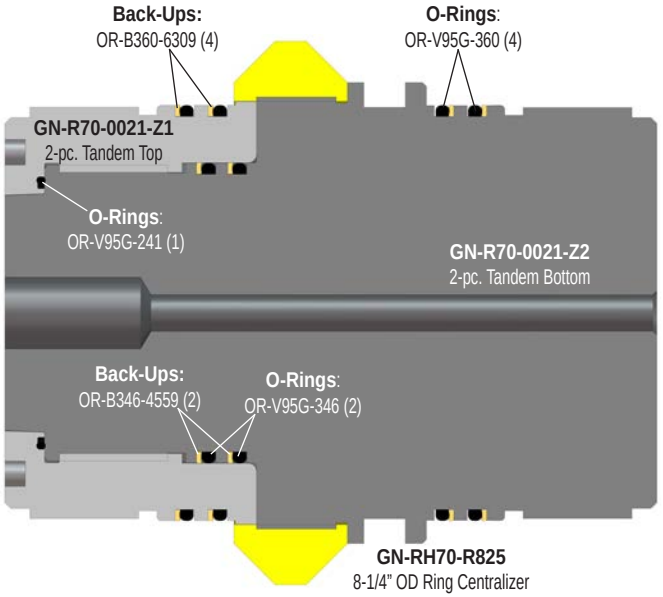
HARDWARE SPECIFICATIONS

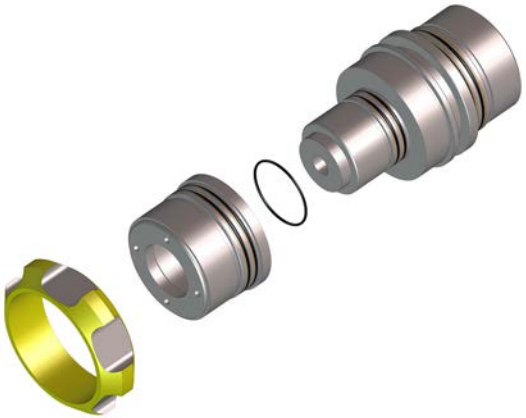
Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab charge retention
Type of Tandem Connection	Booster to booster tandem sub
Nominal OD / Wall Thickness (in)[mm]	7.11 [181] / 0.56 [14.2]*
Upper/Lower Thread Connections	6.25 in. - 5P ACME-2G

**Contact your sales representative for special material requirements.*

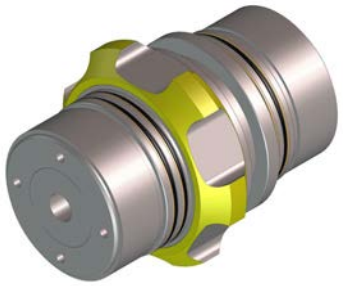
COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
O-Ring Materials and Size Nitrile (standard option)	Top Connection OR-N569-230	Gun Connection OR-N569-360
Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	OR-V95G-230 OR-B230-2813	OR-V95G-360 OR-B360-6309
Lift Sub Assembly, Tandem, 5-1/8"	TC-LT51-000H	
Top Sub, 7" Top Sub Wireline Insert; Spring Contact Assembly	GN-R70-0020 GN-E00-0011 (o-ring: OR-N569-211); GN-E00-0020	
Tandem Sub, 7"	GN-R70-0021 (o-rings: OR-N569-360)	
Two-Piece Tandem 7" with 8-1/4" Centralizing Ring	GN-R70-0021-Z825	
Two-Piece Tandem 7" (Top), GN-R70-0021-Z1; 7" (Bottom), GN-R70-0021-Z2 O-Rings: OR-V95G-241 (1) O-Rings: OR-V95G-346 (2) Back-Up Rings: OR-B346-4559 (2) O-Rings: OR-V95G-360 (4) Back-Up Rings: OR-B360-6309 (4)		
Bull Plugs, 7" Standard 7" with 2-7/8" EUE Pin 7" with 3-1/2" EUE Pin	GN-R70-0022 GN-R70-0023 GN-R70-0024	
Thread Protector, Top Sub (Top Pin) Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	GN-THD-312-020 GN-THD-700-030 GN-THD-700-040	





GN-R70-0021-ZTL
Sub Wrench

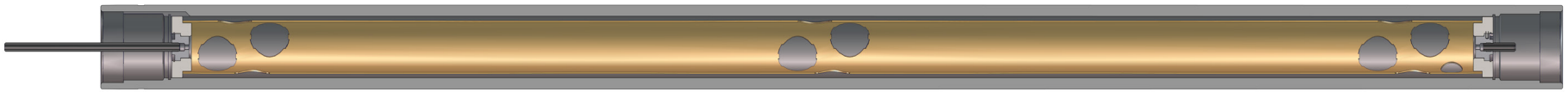


GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer

BLANK GUN ASSEMBLIES

O.D.	Part Number	Description
4-3/4"	GS475HP-45A-BG060	Blank Gun Assembly, 4-3/4" x 5', G140 Material
	GS475HP-45A-BG084	Blank Gun Assembly, 4-3/4" x 7', G140 Material
	GS475HP-45A-BG132	Blank Gun Assembly, 4-3/4" x 11', G140 Material
	GS475HP-45A-BG180	Blank Gun Assembly, 4-3/4" x 15', G140 Material
	GS475HP-45A-BG252	Blank Gun Assembly, 4-3/4" x 21', G140 Material
Carriers (G140 Material)	C475HP-BG060	Carrier Blank Gun- 4-3/4" x 5', 30,000 psi
	C475HP-BG084	Carrier Blank Gun- 4-3/4" x 7', 30,000 psi
	C475HP-BG132	Carrier Blank Gun- 4-3/4" x 11', 30,000 psi
	C475HP-BG180	Carrier Blank Gun- 4-3/4" x 15', 30,000 psi
	C475HP-BG252	Carrier Blank Gun- 4-3/4" x 21', 30,000 psi
Tube Strips	TS4045A-BG060	HP BG Load Tube, 5' Gun
	TS4045A-BG084	HP BG Load Tube, 7' Gun
	TS4045A-BG132	HP BG Load Tube, 11' Gun
	TS4045A-BG180	HP BG Load Tube, 15' Gun
	TS4045A-BG252	HP BG Load Tube, 21' Gun
Spacer Gun Kits (order separately)	GN-BGK475-060	Spacer Gun Kit, 8 Charge Cases, 8 Charge Clips, TCP Transfer Kit GN-000-0035
	GN-BGK475-084	Spacer Gun Kit, 11 Charge Cases, 11 Charge Clips, TCP Transfer Kit GN-000-0035
	GN-BGK475-132	Spacer Gun Kit, 14 Charge Cases, 14 Charge Clips, TCP Transfer Kit GN-000-0035
	GN-BGK475-180	Spacer Gun Kit, 17 Charge Cases, 17 Charge Clips, TCP Transfer Kit GN-000-0035
	GN-BGK475-252	Spacer Gun Kit, 20 Charge Cases, 20 Charge Clips, TCP Transfer Kit GN-000-0035
Carrier Hardware	GN-EP475-4000	Alignment Endplate Assembly, Top
	GN-EP475-4015	Bottom Endplate Assembly
	N5000-350	Snap Ring

Additional shot/phasing options and gun lengths available by special order with lead time.



SLICKWALL CARRIERS

O.D.	Part Number	Description
2” G145 Material	CSW-20G145-060	Carrier Slickwall, 2" x 5'
	CSW-20G145-084	Carrier Slickwall, 2" x 7'
	CSW-20G145-129	Carrier Slickwall, 2" x 11'
	CSW-20G145-177	Carrier Slickwall, 2" x 15'
	CSW-20G145-249	Carrier Slickwall, 2" x 21'
2-7/8” G130 Material	CSW-28G130-060	Carrier Slickwall - 2-7/8" x 5'
	CSW-28G130-084	Carrier Slickwall - 2-7/8" x 7'
	CSW-28G130-132	Carrier Slickwall - 2-7/8" x 11'
	CSW-28G130-180	Carrier Slickwall - 2-7/8" x 15'
	CSW-28G130-252	Carrier Slickwall - 2-7/8" x 21'
3-1/8” G130 Material	CSW-31G130-060	Carrier Slickwall- 3-1/8" x 5', G130 Material
	CSW-31G130-084	Carrier Slickwall- 3-1/8" x 7', G130 Material
	CSW-31G130-132	Carrier Slickwall- 3-1/8" x 11', G130 Material
	CSW-31G130-180	Carrier Slickwall- 3-1/8" x 15', G130 Material
	CSW-31G130-252	Carrier Slickwall- 3-1/8" x 21', G130 Material
3-1/8” X42 Material	CSW-31X42-060	Carrier Slickwall- 3-1/8in x 5', X42 Material, 7500 psi
	CSW-31X42-084	Carrier Slickwall- 3-1/8in x 7', X42 Material, 7500 psi
	CSW-31X42-132	Carrier Slickwall- 3-1/8in x 11', X42 Material, 7500 psi
	CSW-31X42-180	Carrier Slickwall- 3-1/8in x 15', X42 Material, 7500 psi
	CSW-31X42-252	Carrier Slickwall- 3-1/8in x 21', X42 Material, 7500 psi
3-3/8” G130 Material	CSW-33G130-060	Carrier Slickwall- 3-3/8" x 5', G130 Material
	CSW-33G130-084	Carrier Slickwall- 3-3/8" x 7', G130 Material
	CSW-33G130-132	Carrier Slickwall- 3-3/8" x 11', G130 Material
	CSW-33G130-180	Carrier Slickwall- 3-3/8" x 15', G130 Material
	CSW-33G130-252	Carrier Slickwall- 3-3/8" x 21', G130 Material
4” G130 Material	CSW-40G130-060	Carrier Slickwall- 4.00" x 5', G130 Material
	CSW-40G130-084	Carrier Slickwall- 4.00" x 7', G130 Material
	CSW-40G130-132	Carrier Slickwall- 4.00" x 11', G130 Material
	CSW-40G130-180	Carrier Slickwall- 4.00" x 15', G130 Material
	CSW-40G130-252	Carrier Slickwall- 4.00" x 21', G130 Material
4” X42 Material	CSW-40X42-060	Carrier Slickwall- 4in x 5', X42 Material, 6000 psi
	CSW-40X42-084	Carrier Slickwall- 4in x 7', X42 Material, 6000 psi
	CSW-40X42-132	Carrier Slickwall- 4in x 11', X42 Material, 6000 psi
	CSW-40X42-180	Carrier Slickwall- 4in x 15', X42 Material, 6000 psi
	CSW-40X42-252	Carrier Slickwall- 4in x 21', X42 Material, 6000 psi
4-1/2” G130 Material	CSW-45G130-060	Carrier Slickwall, 4-1/2" x 5', G130 Material
	CSW-45G130-084	Carrier Slickwall, 4-1/2" x 7', G130 Material
	CSW-45G130-132	Carrier Slickwall, 4-1/2" x 11', G130 Material
	CSW-45G130-180	Carrier Slickwall- 4-1/2" x 15', G130 Material
	CSW-45G130-252	Carrier Slickwall- 4-1/2" x 21', G130 Material
4-5/8” G130 Material	CSW-46G130-060	Carrier Slickwall- 4-5/8" x 5', G130 Material
	CSW-46G130-084	Carrier Slickwall- 4-5/8" x 7', G130 Material
	CSW-46G130-132	Carrier Slickwall- 4-5/8" x 11', G130 Material
	CSW-46G130-180	Carrier Slickwall- 4-5/8" x 15', G130 Material
	CSW-46G130-252	Carrier Slickwall- 4-5/8" x 21', G130 Material
4-3/4” G140 Material	C475350-SW-060	Carrier Slickwall- 4-3/4” x 5', 30,000 psi
	C475350-SW-084	Carrier Slickwall- 4-3/4” x 7', 30,000 psi
	C475350-SW-0132	Carrier Slickwall- 4-3/4” x 11', 30,000 psi
	C475350-SW-180	Carrier Slickwall- 4-3/4” x 15', 30,000 psi
	C475350-SW-252	Carrier Slickwall- 4-3/4” x 21', 30,000 psi

Additional slickwall carrier lengths available by special order with lead time.

SLICKWALL GUN SYSTEMS with KEYWAY

O.D.	Part Number	Description
2-7/8”	GE2806-6827A-A024	Slickgun Assy, 2-7/8” x 5`, 6 spf, 60° Phased, With Keyway
	GE2806-6827A-A036	Slickgun Assy, 2-7/8” x 7`, 6 spf, 60° Phased, With Keyway
	GE2806-6827A-A060	Slickgun Assy, 2-7/8” x 11`, 6 spf, 60° Phased, With Keyway
	GE2806-6827A-A084	Slickgun Assy, 2-7/8” x 15`, 6 spf, 60° Phased, With Keyway
	GE2806-6827A-A120	Slickgun Assy, 2-7/8” x 21`, 6 spf, 60° Phased, With Keyway
3-1/8”	GE3106-6033A-A024	Carrier Assy, 3-1/8” x 5', 6 spf, 60°, HP SW With Keyway
	GE3106-6033A-A036	Carrier Assy, 3-1/8” x 7', 6 spf, 60°, HP SW With Keyway
	GE3106-6033A-A060	Carrier Assy, 3-1/8” x 11', 6 spf 60°, HP SW With Keyway
	GE3106-6033A-A084	Carrier Assy, 3-1/8” x 15', 6 spf, 60°, HP SW With Keyway
	GE3106-6033A-A120	Carrier Assy, 3-1/8” x 21', 6 spf, 60°, HP SW With Keyway
3-3/8”	GE3306-6033A-A024	Carrier Assy, 3-3/8” x 5', 6 spf, 60°, HP SW With Keyway
	GE3306-6033A-A036	Carrier Assy, 3-3/8” x 7', 6 spf, 60°, HP SW With Keyway
	GE3306-6033A-A060	Carrier Assy, 3-3/8” x 11', 6 spf, 60°, HP SW With Keyway
	GE3306-6033A-A084	Carrier Assy, 3-3/8” x 15', 6 spf, 60°, HP SW With Keyway
	GE3306-6033A-A120	Carrier Assy, 3-3/8” x 21', 6 spf, 60°, HP SW With Keyway
4”	GE4006-6033A-A024	Carrier Assy, 4” x 5', 6 spf, 60 Deg., HP SW With Keyway
	GE4006-6033A-A036	Carrier Assy, 4” x 7', 6 spf, 60 Deg., HP SW With Keyway
	GE4006-6033A-A060	Carrier Assy, 4” x 11', 6 spf, 60 Deg., HP SW With Keyway
	GE4006-6033A-A084	Carrier Assy, 4” x 15', 6 spf, 60 Deg., HP SW With Keyway
	GE4006-6033A-A120	Carrier Assy, 4” x 21', 6 spf, 60 Deg., HP SW With Keyway

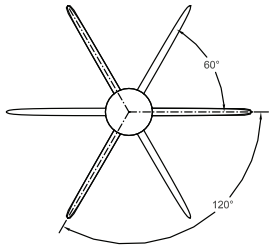
Additional shot/phasing options and gun lengths available by special order with lead time.

HELLFire® Perforating System
3-1/8 in (79 mm), Planar, External Scallops

The HELLFire® perforating system allows more effective multi-stage plug-and-perf operations. At just 9.5-inches total length, HELLFire's three- or six-shot cluster options unlock stage completions not possible with lengthy conventional spiral-phased technology. The short-bodied HELLFire system minimizes wireline tool string length and delivers more clusters per stage. HELLFire's flexible design options allow engineers to specify ideal cluster count and spacing, resulting in lower costs, fewer stages, maximized injectivity, and optimal proppant placement, all with less equipment and a smaller crane.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	1 to 6 shots per cluster, 120° planar phasing (shots 1-3: 0°, 120°, 240°; shots 4-6: 60°, 180°, 300°)
Initiation Point	Bottom-fired, wireline
Mode of Fire	Select fire, addressable
Perforating Condition	In Fluid
Detonating Cord	80-grain round, factory-loaded
Compatible Perforating Charges	HELLFire®
Maximum Gun Swell (in)[mm]	3.46 [87.88] @7.0g



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	16,000 [110.32]
Maximum Tensile* (lbf)[kN]	TBD **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Approx. Weights (Fully Loaded)
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	
GHF31-06C	1-3	120°	9.50	24.13	3.87	98.30	1.42	36.07	9.25 lb/ft
	4-6	60°							
Fully Loaded 6-Shot Carrier with attached Tandem Sub									20.0 lb/ft

HELLFire® CONSTANT ENTRY HOLE AND PENETRATION - EXTERNAL SCALLOPS

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe	Performance in Stressed Berea *(API RP19B Sec. 2)*		
							EHD^ *(in)[cm]*	**EHD Variation Decentralized**	**TTP** *(in)[cm]*
3-1/8" External Scallops 6g-7g	HELLFire 26	EC2-31K0671-26	Fluid	6.0g, RDX	1 to 6 shots per cluster	4-1/2" OD, P110	0.26 [0.66]	7.4 %	3.2 [8.13]
	HELLFire 28	EC2-31K0671-28		6.0g, RDX			0.28 [0.71]	5.5 %	
	HELLFire 33	EC2-31K0771-33		7.0g, RDX			0.33 [0.84]	2.9 %	
	HELLFire 36	EC2-31K0771-36		7.0g, RDX			0.36 [0.91]	1.6 %	
	HELLFire 42	EC2-31K0771-42		7.0g, RDX			0.42 [1.07]	3.8 %	

HELLFire 31K and 33K charges are NOT interchangeable. EC2-31K series are for 3-1/8" HELLFire; EC2-33K series are for 3-3/8" HELLFire.

HARDWARE

Gun Body Configuration/Material Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel

Charge Tube Type & Retention Round steel tube strip; bend tab retention

Type of Tandem Connection Switch tandem subs (ported)

Nominal OD / Wall Thickness (in)[mm] 3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]

Upper/Lower Thread Connections 2.750" 6P ACME-2G

Components and Accessories	Part Number(s)
Short Quick Change Assembly (above top sub)	GN-QC31-0001
Top Sub, 3-1/8" HF (Wireline)	GN-R31HF-QC20
Switch Tandem Sub, 3-1/8" HF (Wireline)	GN-R31HF-T077
Bottom Sub, 3-1/8" (Wireline) Lower sub connection o-rings, 3-1/8" Bottom sub shoot-thru plug and o-ring for shoot-thru plug	GN-R31HF-T075ST OR-N569-230 GN-R33HF-PLG1 / OR-N569-111
O-Ring Materials and Size, Nitrile (standard option)	OR-N569-230
Port Plug, HELLFire Subs and Port Plug O-ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
GO Style Quick Change (bottom sub connection)	EM-QC-QC312-00GO
Thread Protectors Carrier (Gun) Protector, 3-1/8" Carrier (Gun) Plastic Plug Protector, 3-1/8" Top Sub (Top Pin) Thread Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 3-1/8" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-312-030 GN-THD-312-300 GN-THD-312-020 GN-THD-312-040 GN-THD-312-040
Bull Plug, 3-1/8" HF	GN-R31HF-0022

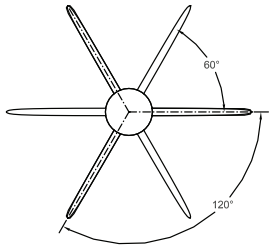
HELLFire® Perforating System
3-3/8 in (86 mm), Planar, Internal and External Scallops

The HELLFire® perforating system allows more effective multi-stage plug-and-perf operations. At just 9.5-inches total length, HELLFire's three- or six-shot cluster options unlock stage completions not possible with lengthy conventional spiral-phased technology. The short-bodied HELLFire system minimizes wireline tool string length and delivers more clusters per stage. HELLFire's flexible design options allow engineers to specify ideal cluster count and spacing, resulting in lower costs, fewer stages, maximized injectivity, and optimal proppant placement, all with less equipment and a smaller crane.

HELLFire 6-Shot Carrier (Internal Scallops), Switch Tandem Subs

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	1 to 6 shots per cluster, 120° planar phasing (shots 1-3: 0°, 120°, 240°; shots 4-6: 60°, 180°, 300°)
Initiation Point	Bottom-fired, wireline
Mode of Fire	Select fire, addressable
Perforating Condition	In Fluid
Detonating Cord	80-grain round, factory-loaded
Compatible Perforating Charges	HELLFire®
Maximum Gun Swell (in)[mm]	Ø3.48" [88.39] @ 7.0g

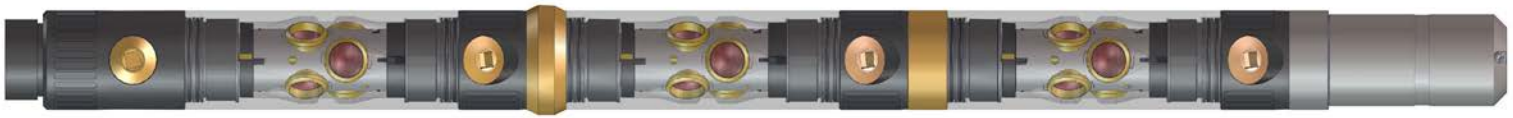


ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	15,000 [103.42]
Maximum Tensile* (lbf)[kN]	331,900 [1476.36] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Approx. Weights (Fully Loaded)	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(lbs)*	*(kgs)*
GHF33-06 (Internal Scallops)	1-3	120°	9.50	24.13	3.87	98.30	1.42	36.07	10.00	4.54
	4-6	60°								
GHF33-06C (External Scallops)	1-3	120°	9.50	24.13	3.87	98.30	1.42	36.07	10.00	4.54
	4-6	60°								
Fully Loaded 6-Shot Carrier with attached Tandem Sub									24.00	10.89



Top Sub, HELLFire 6-Shot Carrier (Internal Scallops), Switch Tandem Subs, Bottom Sub, and Plug/Shoot Adapter

HELLFire® Perforating System
3-3/8 in (86 mm), Planar, Internal and External Scallops

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe	Performance in Stressed Berea *(API RP19B Sec. 2)*		
							EHD^ *(in)[cm]*	**EHD Variation Decentralized**	**TTP** *(in)[cm]*
3-3/8" Internal Scallops 5g-7g	HELLFire 25	EC2-33K0571	Fluid	5.0g, RDX	1 to 6 shots per cluster	5-1/2" - 6.0" OD, P110	0.25 [0.64]	4.3 %	3.5 [8.89]
	HELLFire 30	EC2-33K0771		7.0g, RDX			0.30 [0.76]	2.7 %	
	HELLFire 36	EC2-33K0771-RX		7.0g, RDX			0.36 [0.91]	4.6 %	
3-3/8" External Scallops 6g-7g	HELLFire 25	EC2-33K0671-25	Fluid	6.0g, RDX	1 to 6 shots per cluster	5-1/2" OD, P110	0.25 [0.64]	3.9%	3.5 [8.89]
	HELLFire 30	EC2-33K0771-30		7.0g, RDX			0.30 [0.76]	5.5%	
	HELLFire 33	EC2-33K0771-33		7.0g, RDX			0.33 [0.84]	3.6%	
	HELLFire 34	EC2-33K0771-34		7.0g, RDX			0.34 [0.86]	5.8%	

HELLFire 31K and 33K charges are NOT interchangeable. EC2-31K series are for 3-1/8" HELLFire; EC2-33K series are for 3-3/8" HELLFire.

HARDWARE

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip; bend tab retention
Type of Tandem Connection	Switch tandem subs (ported)
Nominal OD / Wall Thickness (in)[mm]	3.375" [86] / 0.375" [9.53]
Upper/Lower Thread Connections	2.8125" 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

COMPONENTS AND ACCESSORIES

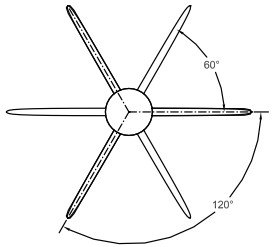
Description	Part Number(s)
Short Quick Change Assembly (above top sub)	GN-QC31-0001
Top Sub, Short Connect 3-3/8" (Wireline)	GN-R33HF-QC20-A
Switch Tandem Sub, 3-3/8" (Wireline)	GN-R33HF-T077
Centralizer Ring, 3-3/4" OD	GN-R33HF-R375
Protector Ring (Lock Ring)	GN-R33-R001HF
Bottom Sub, 3-3/8" (Wireline) Lower sub connection o-rings, 3-1/8" Bottom sub shoot-thru plug and o-ring for shoot-thru plug	GN-R33HF-T075ST-A OR-N569-230 GN-R33HF-PLG1 / OR-N569-111
O-Ring Materials and Size, Nitrile (standard option)	OR-N569-231
Port Plug, HELLFire Subs and Port Plug O-Ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Pumpdown Crossover Sub, QC Pin X 3.12" Box	GN-RX31-QC31
Bull Plug, 3-1/8" HF	GN-R31HF-0022
GO Style Quick Change (bottom sub connection)	EM-QC-QC312-00GO
Thread Protectors Carrier (Gun) Protector, 3-3/8" Carrier (Gun) Plastic Plug Protector, 3-3/8" Top Sub (Top Pin) Thread Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 3-3/8" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-338-030 GN-THD-33HF-300 GN-THD-312-020 GN-THD-338-040 GN-THD-312-040

HELLFire® Perforating System
4 in (102 mm), Planar, Internal Scallops

The HELLFire® perforating system allows more effective multi-stage plug-and-perf operations. HELLFire's three- and six-shot cluster options unlock stage completions not possible with lengthy conventional spiral-phased technology. The short-bodied HELLFire system minimizes wireline tool string length and delivers more clusters per stage. HELLFire's flexible design options allow engineers to specify ideal cluster count and spacing, resulting in lower costs, fewer stages, maximized injectivity, and optimal proppant placement, all with less equipment and a smaller crane.

APPLICATION SPECIFICATIONS

Shot Density and Phasing	1 to 6 shots per cluster, 120° planar phasing (shots 1-3: 0°, 120°, 240°; shots 4-6: 60°, 180°, 300°)
Initiation Point	Bottom-fired, wireline
Mode of Fire	Select fire, addressable
Perforating Condition	In Fluid
Detonating Cord	80-grain round, factory-loaded
Compatible Perforating Charges	HELLFire®
Maximum Gun Swell (in)[mm]	4.60 [116.84] with bur @ 12.0g



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	15,000 [103.42]
Maximum Tensile* (lbf)[kN]	318,000 [1,414.53] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop *@ 0°*		Distance Shot to Shot		Approx. Weights (Fully Loaded) *(lb/ft)*	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*Carrier*	*w/Attached Sub*
HF40-40K-N03	1-3	120°	9.00	22.86	3.80	96.52	N/A		12.5	33.0
HF40-40K-N06	4-6	60°	11.00	27.94	4.75	120.65	1.50	38.10	15.75	36.25

Top Sub, HELLFire 6-Shot Carriers, Switch Tandem Subs, Bottom Sub, and Plug/Shoot Adapter

HELLFire® Perforating System
4 in (102 mm), Planar, Internal Scallops

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe	Performance in Stressed Berea *(API RP19B Sec. 2)*		
							EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
4" Internal Scallops 12g	HELLFire 40	EC2-40K1271	Fluid	12.0g, RDX	1 to 6 shots per cluster	6.0" OD, 26# P110	0.40 [1.02]	3.9%	3.0 [7.62]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

HARDWARE

Gun Body Configuration/Material	Threaded, internally scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Switch tandem subs (ported)
Nominal OD / Wall Thickness (in)[mm]	4.00 [101.60] / 0.375 [9.53]
Upper/Lower Thread Connections	3.4375" 6P ACME-2G

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Short Quick Change Assembly (above top sub)	GN-QC31-0001
Top Sub, Compact 4" (Wireline)	GN-R40HC-CQC20
Switch Tandem Sub, 4" (Wireline)	GN-R40HC-T077
Centralizer Ring/Protector (Lock) Ring	Not Applicable for 4" OD HELLFire
Bottom Sub, 4" (Wireline) Lower sub connection o-rings, 3-1/8" Bottom sub shoot-thru plug and o-ring for shoot-thru plug	GN-R40HC-T075ST2 OR-N569-230 GN-R40HC-PLG1 / OR-N569-214
O-Ring Materials and Size, Nitrile (standard option)	OR-N569-236
Port Plug, HELLFire Subs and Port Plug O-ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Pumpdown Crossover Sub, QC Pin X 3.12" Box	GN-RX31-QC31
GO Style Quick Change (bottom sub connection)	EM-QC-QC312-00GO
Thread Protectors Carrier (Gun) Protector, 4" Carrier (Gun) Plastic Plug Protector, 4" Top Sub (Top Pin) Thread Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 4" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-400-030 GN-THD40-308 GN-THD-312-020 GN-THD-400-040 GN-THD-312-040
Bull Plug, 3-1/8" HF	GN-R31HF-0022

Revised: August 20, 2025 12:34 PM

SandIQ® PRO Perforating System
3-1/8 in (79 mm), GT Spiral

GEODynamics

GEODynamics' SandIQ® PRO technology provides an "off ramp" for more efficient diversion of proppant. Perforating tunnels are tilted 45 degrees in direction of fluid flow. Angled holes are engineered to create a physical diversion on toe side of casing for proppant to naturally flow into the formation. SandIQ shaped charges are engineered to produce precision holes in casing size, weights, and grades which are used in unconventional wells.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot & Phasing Options
Initiation Point	Bottom-fired, wireline
Mode of Fire	Mechanical or addressable, select fire
Detonating Cord	80-grain round
Compatible Perforating Charges	SandIQ®
Maximum Gun Swell (in)[mm]	3.46 [87.88] @22.7g In Fluid

ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	22,500 [155.13]
Maximum Tensile* (lbf)[kN]	202,300 [900] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Shipping Assembly Weight	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(lbs)*	*(kgs)*
GT31-45-J002A	2	180°	18	45.72	5.03	127.76	4.50	114.30	19.0	8.62
GT31-45-G003A	3	120°	24	60.96	5.036	127.91	varies		23.0	10.43
GT31-45-B004A	4	90°	27	68.58	5.036	127.91	varies		26.0	11.79
GT31-45-A006A	6	60°	30	76.20	5.03	127.76	3.50	88.90	29.0	13.15
GT31-45-A008A	8	60°	38	96.52	6.03	153.16	3.50	88.90	37.0	16.78

SandIQ® PRO Perforating System
3-1/8 in (79 mm), GT Spiral

SandIQ® 45° TILT ANGLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Phasing / Charge Tilt Angle	API 19B Targeted Pipe*	Performance in Stressed Berea		
							EHD^ at 45° *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" 13g	SandIQ B	EC2-33A1371-SB	Fluid	13.0g, RDX	60° / 45°	5-1/2" OD, 23# P-110	0.28 [0.71]	4.2 %	5.0 [12.70]
3-1/8" 16g	SandIQ C	EC2-33A1671-SC		16.0g RDX			0.31 [0.79]	3.8 %	
	SandIQ D	EC2-33A1671-SD		16.0g, RDX			0.38 [0.97]	2.6 %	
		EC2-33A1672-SD		16.0g, HMX			0.35 [0.89]	1.7 %	
3-1/8" 20g	SandIQ E	EC2-33A2071-SE		20.0g, RDX			0.42 [1.07]	3.7 %	
		EC2-33A2072-SE		20.0g, HMX			0.41 [1.04]	4.8 %	
3-1/8" 23g	SandIQ F	EC2-33A2371-SF		23.0g, RDX			0.44 [1.12]	1.0 %	
		EC2-33A2372-SF		23.0g, HMX			0.43 [1.09]	6.0 %	
	SandIQ G	EC2-33A2371-SG		23.0g, RDX			0.51 [1.30]	5.2 %	

**3-1/8" SandIQ charge performance is compatible in 4.5" 11.6-15.1# and 5.5" 17-23# P-110 casing.*

HARDWARE

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip; bend tab retention
Type of Tandem Connection	Switch tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]
Upper/Lower Thread Connections	2.750" 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Short Quick Change (SQC) Assembly (one per string, CCL to top sub)	GN-QC31-0001
Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)*	RKQ-GN-QC31-0001
Complete Rebuild Kit with O-Rings *(all required parts)*	RKC-GN-QC31-0001
Top Subs, 3-1/8", Ported	
Top Sub Assembly, Ported, SQC Connection *(recommended)*	GN-R31-CQC20-A
Top Sub Assembly, Ported *(connects to industry-standard quick change)*	GN-R31-T080-A
Switch Tandem Subs, 3-1/8", Ported	
Switch Sub Assembly, 12" long, *6.24" make-up length*	GN-R31-T150-A
Switch Sub Assembly, *3.25" make-up length*	GN-R31-T101-A
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)*	GN-R31-T150L-A
Aligning Switch Sub, RH Lock Ring, *6.24" MUL*	GN-R31-T150R-A
Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R31-T109R-A
Locking Rings, 3-1/8" Tandem Subs	
Left-Hand Thread, HD	GN-R31-L001-319
Right-Hand Thread, HD	GN-R31-R001-319
O-Ring Materials and Size, Nitrile *(standard option)*	OR-N569-230
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Bull Plugs	
3-1/8" Standard	GN-R31-0022
3-1/8" with 2-3/8" EUE Pin	GN-R31-0023
3-1/8" with 2-7/8" EUE Pin	GN-R31-0024
Thread Protectors	
Carrier (Gun) Protector, 3-1/8"	GN-THD-312-030
Carrier (Gun) Plastic Plug Protector, 3-1/8"	GN-THD-312-300
Top Sub (Top Pin) Protector, 3-1/8"	GN-THD-312-020
Tandem Sub & Bull Plug Thread Protector, 3-1/8"	GN-THD-312-040
Bottom Sub Thread Protector (lower connection), 3-1/8"	GN-THD-312-040

Short Quick Change Assembly
GN-QC31-0001

Top Sub, SQC Connection
GN-R31-CQC20-A

Switch Sub Assembly
GN-R31-T150-A

Aligning Switch Sub, LH Lock Ring
GN-R31-T150L-A

Bull Plug, Standard
GN-R31-0022

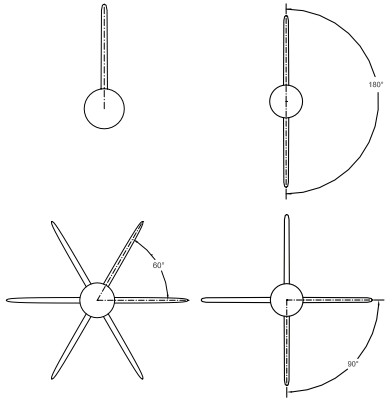
Plug/Shoot Adapter
GN-R31-ST30

Conventional Short Guns
2-3/4 in (70 mm), GLB Spiral

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.

APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot & Phasing Options
Initiation Point	Bottom-fired, wireline, slickline, or tubing
Mode of Fire	Mechanical or addressable, select fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™, Refrax™
Maximum Gun Swell (in)[mm]	2.91 [73.91] @ 15.0g In Fluid; 3.02 [76.20] @ 15.0g Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	25,000 [172.37]
Maximum Tensile* (lbf)[kN]	176,600 [785.56] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Shipping Assembly Weight	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(lbs)*	*(kgs)*
GLB27-O001	1	0°	12	30.48	6.0	152.4	N/A		11.0	5.0
GLB27-J002	2	180°	15	38.10	6.0	152.4	3.0	76.20	13.0	10.0
GLB27-A002	2	60°	15	38.10	6.0	152.4	2.0	50.80	13.0	10.0
GLB27-A007	7		24	60.96					21.0	10.0
GLB27-A010	10		30	76.20					27.0	12.0
GLB27-B003	3	90°	18	45.72	6.0	152.4	3.0	76.20	15.0	8.0
GLB27-B004	4		18	45.72			2.0	50.80	15.0	8.0
GLB27-B007	7		24	60.96					21.0	10.0
GLB27-B010	10		30	76.20					27.0	12.0
GLB27-G003	3	120°	18	45.72	6.0	152.4	3.0	76.20	15.0	8.0
GLB27-G004	4		18	45.72			2.0	50.80	15.0	8.0
GLB27-G007	7		24	60.96					21.0	10.0
GLB27-G010	10		30	76.20					27.0	12.0

Conventional Short Guns
2-3/4 in (70 mm), GLB Spiral

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD^ *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
2-3/4" 11g-15g	FracIQ 30	EC2-27A1171	Fluid	11.0g, RDX	6 spf / 60°	4-1/2" OD P110	0.30 [0.76]	13.0 [33.02]	0.30 [0.76]	2.7 %	5.0 [12.70]
	FracIQ 35	EC2-27A1271		12.0g, RDX			0.35 [0.89]		0.35 [0.89]	5.9 %	
	FracIQ 40	EC2-27A1571		15.0g, RDX			0.40 [1.02]		0.40 [1.02]	6.3 %	

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
2-3/4" 15g	2715 Connex SDP	EC2-27A1521-RC	In Fluid or Dry	15.0g, RDX	6 spf /60°	4-1/2" 11.6# L-80			0.30 [0.76]	11.70 [29.72]
		EC2-27A1522-RC		15.0g, HMX					0.31 [0.79]	12.18 [30.94]
	2715 Razor XDP	EC2-27A1521		15.0g, RDX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1522		15.0g, HMX			0.39 [0.99]	37.45 [95.12]		
		EC2-27A1523		15.0g, HNS					0.31 [0.79]	10.50 [26.67]
	2715 Basix XDP	EC2-27A1521-E		15.0g, RDX			0.39 [0.99]	31.80 [80.77]	0.32 (0.81)	9.40 [23.88]
		EC2-27A1522-E		15.0g, HMX			0.38 [0.97]	32.75 [83.19]	0.35 [0.89]	10.60 [26.92]

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing	
						O.D./Material	EHD *(in)[cm]*	O.D./Material	EHD *(in)[cm]*
2-3/4" 11g-15g	2711 Refrax	EC2-27A1171-R	Fluid	11.0g, RDX	6 spf / 60°	4" P110	0.29-0.30 [0.74-0.76]	5-1/2" P110	0.37-0.41 [0.94-1.04]
	2715 Refrax	EC2-27A1571-R		15.0g, RDX			0.34-0.36 [0.86-0.91]		0.34-0.42 [0.86-1.07]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Conventional Short Guns
2-3/4 in (70 mm), GLB Spiral

HARDWARE

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip; bend tab retention
Type of Tandem Connection	Booster to booster (no splice)
Nominal OD / Wall Thickness (in)[mm]	2.75" [69.85] / 0.313 [7.95]
Upper/Lower Thread Connections	2.375" - 6P ACME 2G

Top Sub, TCP
GN-R27-0020

Tandem Sub, TCP
GN-R27-0021

Switch Tandem Sub, Wireline
GN-R27-T100-A

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Top Subs, 2-3/4"		
Top Sub, TCP	GN-R27-0020	
Top Sub, Wireline	GN-R27-0035	
Top Sub Lift Sub Assembly, 2-3/4" and 2-7/8"	TC-QC27-000	
Tandem Subs, 2-3/4"		
Tandem Sub, TCP	GN-R27-0021	
Switch Tandem Sub, Wireline, Ported, *3" make-up length*	GN-R27-T100-A	
Aligning Switch Sub, LH Lock Ring	GN-R27-T125-A	
O-Ring Materials and Size	Top Connection	Gun Connection
Nitrile (standard option)	OR-N569-225	OR-N569-227
Viton (with back-up rings required for > 325°F)	OR-V95G-225	OR-V95G-227
Back-up rings for > 325°F	OR-B225-2160	OR-B227-2405
Thread Protectors		
Top Sub (Top Pin)	GN-THD-QC27-020	
Carrier (Gun) Protector	GN-THD-275-030	
Tandem Sub & Bull Plug Protector	GN-THD-275-040	
Bull Plugs		
2-3/4" Standard	GN-R27-0022	
2-3/4" with 2-3/8" EUE Pin	GN-R27-0023	
2-3/4" Shoot-Thru	GN-R27-ST27	
2-3/4" Shoot-Thru Assembly *(GN-R27-T150-A and GN-R27-ST27)*	GN-R27-ST30	

Aligning Switch Sub, LH Lock Ring
GN-R27-T125-A

Bull Plug
GN-R27-0022

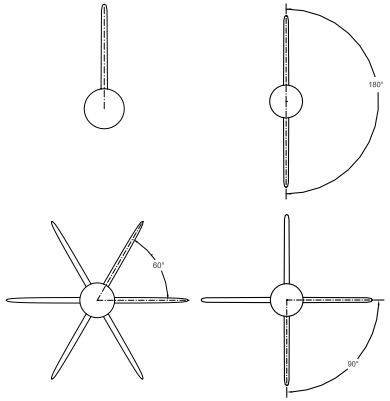
2-3/4" Switch Sub Assembly
GN-R27-T150-A

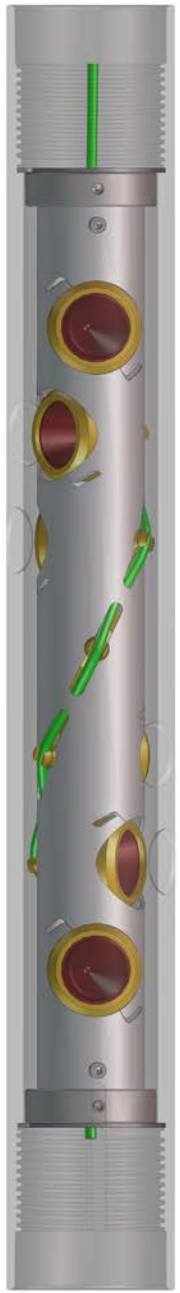
2-3/4" Shoot-Thru
GN-R27-ST27

2-3/4" Shoot-Thru Assembly
GN-R27-ST30
Switch NOT included (shown for reference only)

Conventional Short Guns
3-1/8 in (79 mm), GLB Spiral

GEODynamics' perforating systems use bi-directional boosters, non-lead azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.





APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot & Phasing Options
Initiation Point	Bottom-fired, wireline, slickline, or tubing
Mode of Fire	Mechanical or addressable, select fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™, Basix Frac, Refrax™
Maximum Gun Swell (in)[mm]	3.46 [87.88] @ 22.7g In Fluid; 3.60 [91.44] @ 19.0g Dry

ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	22,500 [155.13]
Maximum Tensile* (lbf)[kN]	202,300 [900] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Shipping Assembly Weight	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(lbs)*	*(kgs)*
GLB31-O002	2	0°	15	38.1	6.0	152.4	3.0	76.20	15.0	6.8
GLB31-J002		180°	15	38.1						
GLB31-O003	3	0°	18	45.72					18.0	8.2
GLB31-G003		120°	18	45.72						
GLB31-B004	4	90°	18	45.72			2.0	50.80		
GLB31-P005S	5	72°	20	50.80					20.0	9.0
GLB31-A005		60°	20	50.80						
GLB31-A006	6	60°	22	55.88					22.0	10.0
GLB31-O006		0°	22	55.88						
GLB31-A007T	7	60°	24	60.96					24.0	10.9
GLB31-R008	8	90° + 45°	26	66.04					26.0	11.8
GLB31-A009	9	60°	28	71.12					30.0	13.5
GLB31-A010	10	60°	30	76.20					30.0	13.5
GLB31-R010		72°	30	76.20						
GLB31-A013	13	60°	36	91.44					36.0	16.0

Revised: August 20, 2025 12:34 PM

Conventional Short Guns
3-1/8 in (79 mm), GLB Spiral

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Concrete		Performance in Stressed Berea		
							EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-1/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.22 [0.56]	13.0 [33.02]	0.22 [0.56]	5.5%	5.0 [12.70]
	Basix Frac 25	EC2-33A1271-BF		12.0g, RDX			0.26 [0.66]	12.0 [30.48]	0.26 [0.66]	2.4 %	4.0 [10.16]
	FracIQ 25	EC2-33A1371		13.0g, RDX			0.26 [0.66]	13.0 [33.02]	0.26 [0.66]	4.1 %	5.0 [12.70]
3-1/8" 13g-16g	FracIQ Connex 30 †	EC2-33A1471-FRX	Fluid	14.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.31 [0.79]	6.0 %	5.0 [12.70]
	Basix Frac 30	EC2-33A1471-BF		14.0g, RDX			0.31 [0.79]	12.0 [30.48]	0.31 [0.79]	4.0 %	4.0 [10.16]
	FracIQ 30	EC2-33A1671		16.0g, RDX			0.31 [0.79]	13.0 [33.02]	0.31 [0.79]	3.1 %	5.0 [12.70]
	FracIQ 30	EC2-33A1672		16.0g, HMX			0.34 [0.86]		0.34 [0.86]	3.8 %	
3-1/8" 16g-20g	FracIQ Connex 35 †	EC2-33A1671-FRX	Fluid	16.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.36 [0.91]	5.0 %	5.0 [12.70]
	Basix Frac 35	EC2-33A1871-BF		18.0g, RDX			0.36 [0.91]	12.0 [30.48]	0.36 [0.91]	3.4 %	4.0 [10.16]
	FracIQ 35	EC2-33A2071		20.0g, RDX			0.36 [0.91]	13.0 [33.02]	0.36 [0.91]	2.5 %	5.0 [12.70]
	FracIQ 35	EC2-33A2072		20.0g, HMX			0.37 [0.94]		0.37 [0.94]	3.0 %	
3-1/8" 19g-23g	FracIQ Connex 40 †	EC2-33A1971-FRX	Fluid	19.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110			0.41 [1.04]	6.5 %	5.0 [12.70]
	FracIQ 40	EC2-33A2371		23.0g, RDX			0.40 [1.02]	13.0 [33.02]	0.40 [1.02]	3.3 %	
	FracIQ 40	EC2-33A2372		23.0g, HMX			0.41 [1.04]		0.41 [1.04]	3.8 %	
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX			0.40 [1.02]	12.0 [30.48]	0.40 [1.02]	6.6 %	4.0 [10.16]
	Basix Frac 40	EC2-33A2371-BF		23.0g, RDX		6" OD, P110	0.40 [1.02]		0.40 [1.02]	7.5 %	
	Basix Frac 40	EC2-33A2372-BF		23.0g, HMX		4-1/2" - 5-1/2" OD, P110					
3-1/8" 20g-23g	FracIQ 45	EC2-33A2071-45	Fluid	20.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.45 [1.14]	13.0 [33.02]	0.45 [1.14]	5.6 %	5.0 [12.70]
	FracIQ Connex 45 †	EC2-33A2371-FRX		21.0g, RDX					0.45 [1.14]	3.2 %	
	Basix Frac 45	EC2-33A2371-BF45		23.0g, RDX			0.45 [1.14]	12.0 [30.48]	0.45 [1.14]	5.9 %	4.0 [10.16]
3-1/8" 23g	FracIQ 50	EC2-33A2371-50 †† EC2-33A2371-50G	Fluid	23.0g, RDX	6 spf / 60°	4-1/2" - 5-1/2" OD, P110	0.50 [1.27]	13.0 [33.02]	0.50 [1.27]	1.5 %	5.0 [12.70]
	FracIQ 50	EC2-33A2372-RX		23.0g, HMX		5-1/2" OD, P110	0.50 [1.27]		0.50 [1.27]	4.6 %	
	Basix Frac 50	EC2-33A2371-BF50		23.0g, RDX		4-1/2" - 5-1/2" OD, P110	0.50 [1.27]	12.0 [30.48]	0.50 [1.27]	4.8 %	4.0 [10.16]
	FracIQ 55	EC2-33A2371-55		23.0g, RDX		4-1/2" OD, P110	0.55 [1.40]	13.0 [33.02]	0.55 [1.40]	3.8 %	5.0 [12.70]

†FracIQ® Connex® charges (part numbers ending with -FRX) designate charges that combine FracIQ technology with Connex Clean Perforation Technology to achieve a constant hole size and tunnel cleaning action in one shaped charge. ††EC2-33A2371-50G has a custom, externally-grooved case (special application).
**3-1/8" FracIQ charge performance is compatible in 4.5" 11.6-15.1# and 5.5" 17-23# P-110 casing.*

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Conventional Short Guns
3-1/8 in (79 mm), GLB Spiral

GEODynamics®

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 19g	3319 Connex RX	EC2-33A1991-RX	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921	‡ Fluid or Dry	19.0g, RDX			0.51 [1.30]	42.10 [106.93]		
		EC2-33A1922		19.0g, HMX			0.49 [1.24]	41.10 [104.39]	0.43 [1.09]	14.60 [37.08]
	3319 Basix XDP	EC2-33A1921-E	‡ Fluid or Dry	19.0g, RDX			0.43 [1.09]	35.80 [90.93]		
		EC2-33A1922-E		19.0g, HMX						
	3319 Basix XDP	EC2-33A1921-EG	Fluid	19.0g, RDX			0.43 [1.09]	35.70 [90.68]		
	3319 Basix DP	EC2-33A1951	‡ Fluid or Dry	19.0g, RDX			0.54 [1.37]	29.20 [74.17]		
		EC2-33A1952		19.0g, HMX						
3-1/8" 23g	3323 Connex SDP	EC2-33A2321-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.42 [1.07]	39.02 [99.11]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS			0.35 [0.89]	26.05 [66.17]	0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E		22.7g, RDX			0.42 [1.07]	46.00 [116.84]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.43 [1.09]	46.37 [117.78]		
	3323 Basix GH	EC2-33A2321-EG		22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX			0.43 [1.09]	45.70 [116.08]	0.40 [1.02]	11.90 [30.23]

‡ *For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.*

DUAL CASING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	Inner Casing		Outer Casing	
						O.D./Material	**EHD** *(in)[cm]*	O.D./Material	**EHD** *(in)[cm]*
3-1/8" 14g-23g	3314 Refrax	EC2-33A1471-D	Fluid	14.0g, RDX	6 spf / 60°	Expanded 4" P110	0.33-0.33 [0.84-0.84]	5-1/2 P110	0.30-0.30 [0.76-0.76]
	3316 Refrax	EC2-33A1671-D		16.0g, RDX			0.37-0.38 [0.94-0.95]		0.35-0.35 [0.89-0.89]
	3320 Refrax	EC2-33A2071-D		20.0g, RDX			0.41-0.42 [1.04-1.07]		0.40-0.40 [1.02-1.02]
	3316 Refrax	EC2-33A1671-D		16.0g, RDX	6 spf / 60°	4-1/2" P110	0.30-0.32 [0.76-0.81]	7.0" P110	0.39-0.41 [0.99-1.04]
	3323 Refrax	EC2-33A2371-D		23.0g, RDX			0.41-0.42 [1.04-1.07]		0.35-0.35 [0.89-0.89]

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Patents: www.oilstatesintl.com/patents

Conventional Short Guns
3-1/8 in (79 mm), GLB Spiral

GEODynamics®

BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80	0.78 [1.98]	7.60 [19.30]		
		EC2-33A2332		22.7g, HMX			0.79 [2.01]	7.80 [19.81]		

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-1/8" 19g	3319 Connex XEH	EC2-33A1941-RC	‡ Fluid or Dry	19.0g, RDX	5 spf / 60° (Dry) 6 spf / 60° (Fluid)	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
	3319 Basix GH	EC2-33A1941		19.0g, RDX			0.60 [1.52]	28.60 [72.64]		
		EC2-33A1942		19.0g, HMX						
3-1/8" 23g	3323 Connex XEH	EC2-33A2341-RC	Fluid	22.7g, RDX	6 spf / 60°	4-1/2"			0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341-E		22.7g, RDX		5-1/2" 17.0# L-80	0.43 [1.09]	44.0 [111.76]		
		EC2-33A2342-E		22.7g, HMX		4-1/2"				

‡ For 3-1/8" 19g in dry gas, maximum shot density is 5 spf or limited to one- (1) and two- (2) shot short guns only.

HARDWARE

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip, bend tab retention
Type of Tandem Connection	Switch tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.15 [80.01] / 0.315 [8.00] or 3.125 [79.38] / 0.3125 [7.94]
Upper/Lower Thread Connections	2.750" 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

COMPONENTS AND ACCESSORIES

Description	Part Number(s)
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001
Top Subs, 3-1/8", Ported Top Sub Assembly, Ported, SQC Connection *(recommended)* Top Sub Assembly, Ported *(connects to industry-standard quick change)*	 GN-R31-CQC20-A GN-R31-T080-A
Top Sub, 3-1/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly	GN-R31-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020
Tandem Sub, 3-1/8", Conventional and TCP	GN-R31-0021
Switch Tandem Subs, 3-1/8", Ported Switch Sub Assembly, 12" long, *6.24" make-up length* Switch Sub Assembly, *3.25" make-up length*	 GN-R31-T150-A GN-R31-T101-A
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R31-T150L-A GN-R31-T150R-A GN-R31-T109R-A
Locking Rings, 3-1/8" Tandem Subs Left-Hand Thread, HD Right-Hand Thread, HD	 GN-R31-L001-319 GN-R31-R001-319
O-Ring Materials and Size, Nitrile *(standard option)*	OR-N569-230
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217
Plug/Shoot Adapter Assembly, 3-1/8"	GN-R31-ST30
Bull Plugs 3-1/8" Standard 3-1/8" with 2-3/8" EUE Pin 3-1/8" with 2-7/8" EUE Pin	 GN-R31-0022 GN-R31-0023 GN-R31-0024
Thread Protectors Carrier (Gun) Protector, 3-1/8" Carrier (Gun) Plastic Plug Protector, 3-1/8" Top Sub (Top Pin) Protector, 3-1/8" Tandem Sub & Bull Plug Thread Protector, 3-1/8" Bottom Sub Thread Protector (lower connection), 3-1/8"	 GN-THD-312-030 GN-THD-312-300 GN-THD-312-020 GN-THD-312-040 GN-THD-312-040

Wireline Insert
GN-E00-0011

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Short Quick Change Assembly
GN-QC31-0001

Top Sub, SQC Connection
GN-R31-CQC20-A

Switch Sub Assembly
GN-R31-T150-A

Aligning Switch Sub, LH Lock Ring
GN-R31-T150L-A

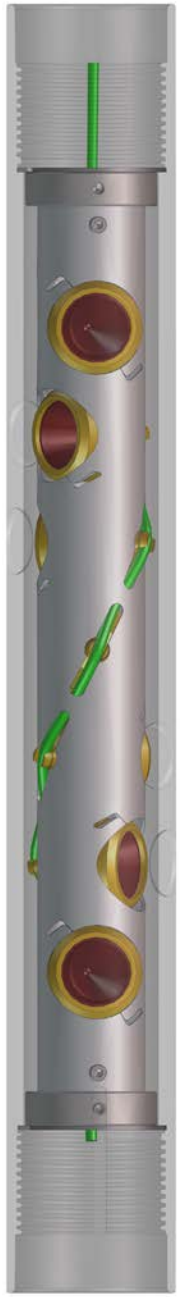
Plug/Shoot Adapter
GN-R31-ST30

Bull Plug, Standard
GN-R31-0022

Conventional Short Guns
3-3/8 in (86 mm), GLB Spiral

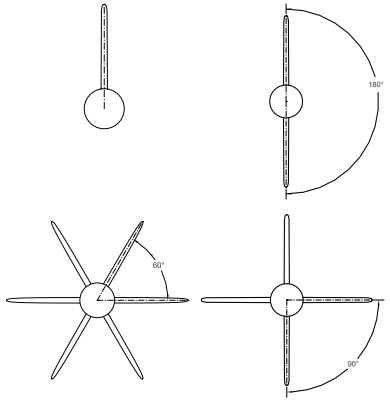
GEODynamics

GEODynamics' perforating systems use bi-directional boosters, non-leaOOOd azide explosives, customized connectors and inserts, and high-velocity, low-shrink detonating cord. Additionally, all GEODynamics gun assemblies are scalloped to optimize charge performance and prevent casing damage from perforating exit hole burrs. Shot phasing is designed to maintain the integrity and collapse resistance of the casing after perforating. These attributes, along with premium quality gun material and gun connectors, allow GEODynamics to deliver safe, efficient, and reliable perforating gun solutions to our customers.



APPLICATION SPECIFICATIONS

Shot Density and Phasing Options	Multiple Shot & Phasing Options
Initiation Point	Bottom-fired, wireline, slickline, or tubing
Mode of Fire	Mechanical or addressable, select fire
Detonating Cord	80-grain round
Compatible Perforating Charges	FracIQ®, Connex®, Razor®, Basix™
Maximum Gun Swell (in)[mm]	3.56 [90.42] @ 25.00g In Fluid; 3.63 [92.20] @ 22.7g Dry



ENVIRONMENTAL

Maximum Pressure (psi)[MPa]	22,700 [156.51]
Maximum Tensile* (lbf)[kN]	331,900 [1476.36] **Hardware Calculated Breaking Point*

CARRIER SPECIFICATIONS

Carrier Assembly Part Number	Shot & Phasing Options		Gun Lengths		Gun End to Center of First Scallop @ 0°		Distance Shot to Shot		Shipping Assembly Weight	
	# Shots	*Phasing*	*(in)*	*(cm)*	*(in)*	*(mm)*	*(in)*	*(mm)*	*(lbs)*	*(kgs)*
GLB33-J002	2	180°	15	38.10	6.00	152.40	3.0	76.20	21.0	9.5
GLB33-G003	3	120°	18	45.72					25.0	11.3
GLB33-B004	4	90°	18	45.72			2.0	50.80	25.0	11.3
GLB33-P005S	5	72°	20	50.80					28.0	12.6
GLB33-A006	6	60°	22	55.88					31.0	14.0
GLB33-A007T	7	60°	24	60.96					34.0	15.3
GLB33-P007S		51.4°	24	60.96					34.0	15.3
GLB33-R008	8	90° + 45°	26	66.04					36.0	16.2
GLB33-A010	10	60°	30	76.20					42.0	18.9
GLB33-R010		72°	30	76.20					42.0	18.9
GLB33-R012	12	60° + 30°	34	86.36					48.0	21.6
GLB33-R014	14	51.4° + 25.7°	38	96.52					53.0	23.9

Revised: August 20, 2025 12:34 PM

Conventional Short Guns
3-3/8 in (86 mm), GLB Spiral

GEODynamics®

CONSTANT ENTRY HOLE AND PENETRATION

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	API 19B Targeted Pipe*	Performance in Stressed Berea *(API RP19B Sec. 2)*		
							EHD^ *(in)[cm]*	EHD Variation Decentralized	TTP *(in)[cm]*
3-3/8" 12g-13g	FracIQ 20	EC2-33A1271	Fluid	12.0g, RDX	6 spf / 60°	4.5"-5.5" OD P110	0.22 [0.56]	5.5%	5.0 [12.70]
	FracIQ 25	EC2-33A1371		13.0g, RDX		6.0" OD P110	0.26 [0.66]	2.3 %	

DEEP PENETRATING/EXTREME DEEP PENETRATING

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	EHD *(in)[cm]*	TTP *(in)[cm]*	EHD^ *(in)[cm]*	TTP *(in)[cm]*
3-3/8" 19g	3319 Connex RX	EC2-33A1991-RX	In Fluid or Dry	19.0g, RDX	6 spf / 60°	5-1/2"			0.32 [0.81]	11.30 [28.70]
		EC2-33A1992-RX		19.0g, HMX					0.32 [0.81]	11.60 [29.46]
	3319 Razor XDP	EC2-33A1921		19.0g, RDX		4-1/2" 11.6# L-80	0.51 [1.30]	42.07 [106.86]		
		EC2-33A1922		19.0g, HMX					0.43 [1.09]	14.60 [37.08]
3-3/8" 23g	3323 Connex SDP	EC2-33A2321-RC	In Fluid or Dry	22.7g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.60 [39.62]
		EC2-33A2322-RC		22.7g, HMX					0.46 [1.17]	15.31 [38.89]
		EC2-33A2323-RC		22.7g, HNS					0.36 [0.91]	11.85 [30.10]
	3323 Razor XDP	EC2-33A2321		22.7g, RDX					0.41 [1.04]	16.40 [41.66]
		EC2-33A2322		22.7g, HMX			0.45 [1.14]	46.32 [117.65]	0.44 [1.12]	15.68 [39.83]
		EC2-33A2323		22.7g, HNS					0.37 [0.94]	12.12 [30.78]
	3323 Basix XDP	EC2-33A2321-E	In Fluid or Dry	22.7g, RDX			0.45 [1.14]	46.32 [117.65]	0.39 [0.99]	12.30 [31.24]
		EC2-33A2322-E		22.7g, HMX			0.44 [1.12]	46.90 [119.13]		
	3323 Basix GH	EC2-33A2321-EG	Fluid	22.7g, RDX					0.41 [1.04]	11.90 [30.23]
		EC2-33A2322-EG		22.7g, HMX					0.40 [1.02]	11.90 [30.23]
	3323 Basix DP	EC2-33A2351	In Fluid or Dry	22.7g, RDX			0.47 [1.19]	32.10 [81.53]		
		EC2-33A2352		22.7g, HMX						
3-3/8" 25g	3325 Connex SDP	EC2-33B2521-RC	Fluid	25.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.40 [1.02]	15.10 [38.35]
		EC2-33B2522-RC		25.0g, HMX					0.48 [1.22]	15.45 [39.24]
		EC2-33B2523-RC		25.0g, HNS					0.35 [0.89]	12.30 [31.24]
	3325 Razor XDP	EC2-33B2521		25.0g, RDX			0.45 [1.14]	44.58 [113.23]	0.39 [0.99]	17.10 [43.43]
		EC2-33B2522		25.0g, HMX			0.53 [1.35]	47.30 [120.14]	0.50 [1.27]	16.27 [41.33]
		EC2-33B2523		25.0g, HNS			0.37 [0.94]	30.20 [76.71]	0.36 [0.91]	13.20 [33.53]
	3325 Basix XDP	EC2-33B2521-E		25.0g, RDX			0.45 [1.14]	50.10 [127.25]	0.40 [1.02]	12.30 [31.24]
		EC2-33B2522-E		25.0g, HMX			0.47 [1.19]	47.42 [120.45]		

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

Conventional Short Guns
3-3/8 in (86 mm), GLB Spiral

GEODynamics®

BIG HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-3/8" 23g	3323 Basix BH	EC2-33A2331	Fluid	22.7g, RDX	6 spf / 60°	5-1/2" 17.0# L-80	0.70 [1.78]	5.79 [14.71]	0.69 [1.75]	4.05 [10.29]
		EC2-33A2332		22.7g, HMX						

GOOD HOLE

Carrier O.D.	Shaped Charge	Part Number	Perforating Condition	Explosive	Shot Density / Phasing	^Casing O.D.	Performance in Concrete		Performance in Stressed Berea	
						Application	**EHD** *(in)[cm]*	**TTP** *(in)[cm]*	**EHD^** *(in)[cm]*	**TTP** *(in)[cm]*
3-3/8" 19g	3319 Connex XEH	EC2-33A1941-RC	In Fluid or Dry	19.0g, RDX	6 spf / 60°	4-1/2" 11.6# L-80			0.41 [1.04]	14.20 [36.07]
		EC2-33A1942-RC		19.0g, HMX					0.42 [1.07]	14.37 [36.50]
3-3/8" 23g	3323 Connex XEH	EC2-33A2341-RC	In Fluid or Dry	22.7g, RDX					0.43 [1.09]	15.60 [39.62]
		EC2-33A2342-RC		22.7g, HMX					0.43 [1.09]	15.89 [40.36]
	3323 Basix GH	EC2-33A2341		22.7g, RDX			0.52 [1.32]	33.58 [85.29]		
		EC2-33A2342		22.7g, HMX						
3-3/8" 25g	3325 Connex XEH	EC2-33B2541-RC	Fluid	25.0g, RDX						
		EC2-33B2542-RC		25.0g, HMX					0.40 [1.02]	14.92 [37.90]
	3325 Basix GH	EC2-33B2541		25.0g, RDX			0.57 [1.45]	25.91 [65.81]	0.50 [1.27]	16.50 [41.91]

HARDWARE

Gun Body Configuration/Material	Threaded and scalloped, proprietary gun steel, similar to 41XX alloy steel
Charge Tube Type & Retention	Round steel tube strip; bend tab retention
Type of Tandem Connection	Switch tandem sub
Nominal OD / Wall Thickness (in)[mm]	3.375 [85.73] / 0.3775 [9.59]
Upper/Lower Thread Connections	2.8125" 6P ACME-2G

Performance in concrete represents API RP43 or API RP19B Section I testing results with the shot density/phasing, casing OD, casing weight, and casing grade specified.
^EHD performance in stressed berea represents API RP19B Section 2 testing results with casing flat metal plate equivalent to 0.500" 120KSI yield and penetration (TTP) in stressed berea rock.
FLUID: Qualified for shooting in FLUID only with perforating systems qualified by GEODynamics.
IN FLUID or DRY: Qualified for shooting in FLUID or DRY GAS with perforating systems qualified by GEODynamics.

Revised: August 20, 2025 12:34 PM

COMPONENTS AND ACCESSORIES

Description	Part Number(s)	
Short Quick Change (SQC) Assembly (one per string, CCL to top sub) Quick Rebuild Kit *(contacts, teflon tubing, screw, spring, insulating retainer)* Complete Rebuild Kit with O-Rings *(all required parts)*	GN-QC31-0001 RKQ-GN-QC31-0001 RKC-GN-QC31-0001	
Top Sub, 3-3/8", Conventional and TCP Wireline Insert & O-Ring Spring Contact Assembly Top Sub, Wireline Top Sub, Ported, SQC Connection	GN-R33-0020 GN-E00-0011 (o-ring: OR-N569-211) GN-E00-0020 GN-R33-0035 GN-R33-CQC20-A	
Top Sub Lift Sub Assembly, 3-3/8"	TC-LT33-000	
Tandem Sub, 3-3/8", Conventional and TCP	GN-R33-0021	
Ported Switch Tandem Sub Assembly, 12" long, *6.24" make-up length* Ported Switch Tandem Sub Assembly, *3.25" make-up length*	GN-R33-T150-A GN-R33-T100-A	
Aligning Switch Sub, LH Lock Ring, *6.24" make-up length (MUL)* Aligning Switch Sub, RH Lock Ring, *6.24" MUL* Aligning Short Switch Sub, RH*, **compatible with centralizer rings*	GN-R33-T150L-A GN-R33-T150R-A GN-R33-T109R-A	
Locking Ring, Left-Hand Thread Locking Ring, Right-Hand Thread	GN-R33-L001 GN-R33-R001	
O-Ring Materials and Size Nitrile (standard option) Viton (with back-up rings required for > 325°F) Back-up rings for > 325°F	Top Connection OR-N569-230 OR-V95G-230 OR-B230-2813	Gun Connection OR-N569-231 OR-V95G-231 OR-B231-2870
Port Plug and Port Plug O-Ring	GN-R00-T001 / OR-N569-217	
3-3/8" Bull Plug, Standard 3-3/8" Bull Plug, with 2-3/8" EUE Pin 3-3/8" Bull Plug, with 2-7/8" EUE Pin	GN-R33-0022 GN-R33-0023 GN-R33-0024	
Plug/Shoot Adapter Assembly, 3-3/8"	GN-R33-ST30	
Thread Protectors, 3-3/8" Top Sub (Top Pin) Carrier (Gun) Plastic Plug Protector Carrier (Gun) Protector Tandem Sub & Bull Plug Protector	 GN-THD-312-020 GN-THD-338-100 GN-THD-338-030 GN-THD-338-040	

Wireline Insert
GN-E00-0011

Short Quick Change Assembly
GN-QC31-0001

Spring Contact Assembly
GN-E00-0011
(4-1/2" OD top sub shown for reference only)

Top Sub, SQC Connection
GN-R33-CQC20-A

Top Sub
GN-R33-0020

Top Sub, Wireline
GN-R33-0035

Tandem Sub
GN-R33-0021

Switch Tandem Sub
GN-R33-T150

Switch Tandem Sub Assy
GN-R33-T100-A

Aligning Switch Sub,
LH Lock Ring
GN-R33-T150L-A

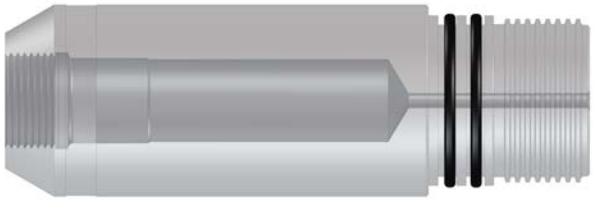
Bull Plug, Standard
GN-R33-0022

Plug/Shoot Adapter
GN-R33-ST30

Revised: August 20, 2025 12:34 PM

Conventional Subs
Wireline Top Subs (GO Style Quick Change)

GEODynamics' wireline top sub fits the standard 1-3/16" 12P GO Style tear drop upper head connection and standard thread downhole (pin) connections to perforating gun sizes 1-9/16" through 3-3/8" OD. The gun connection uses double o-rings and optional back-up rings.



Standard 1-3/16" 12P GO Style Tear Drop Upper Head Connection.

Wireline Top Sub
GN-R23-0035
(shown)

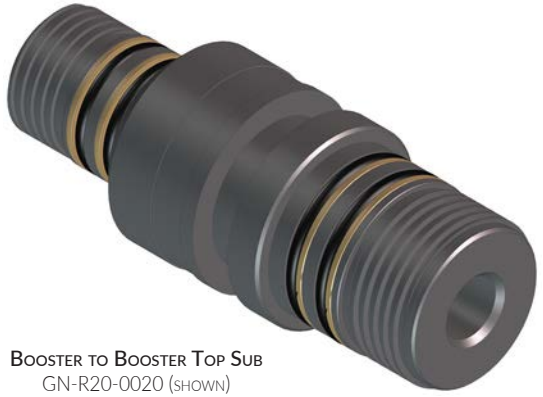
Mechanical Specifications							
Gun Size (OD)	**Part Number**	**Makeup Length** *(in/cm)*	**Overall Length** *(in/cm)*	**Weight** *(lbs)*	**Gun Connection** *(DH)*	**O-Rings** *(2)*	**Back-Up Rings** *(2)*
1-9/16"	GN-R16-0035	5.25 / 13.34	6.75 / 17.15	2.12	1-9/32" 12P STUB ACME - 2G	OR-N569-215	OR-B215-1308
1-3/4"	GN-R175-0035	5.25 / 13.34	7.00 / 17.78	3.11	1-7/16" 12P STUB ACME - 2G	OR-N569-218	OR-B217-1468
2"	GN-R20-0035	5.25 / 13.34	7.00 / 17.78	4.58	1-11/16" 8P STUB ACME	OR-N569-221	OR-B221-1715
2-3/8"	GN-R23-0035	5.25 / 13.34	7.25 / 18.42	7.04	2-1/32" 8P STUB ACME - 2G	OR-N569-225	OR-B225-2126
2-1/2"	GN-R25-0035	5.25 / 13.34	7.25 / 18.42	7.72	2-1/8" 8P ACME - 2G	OR-N569-225	OR-B225-2160
2-3/4"	GN-R27-0035	5.25 / 13.34	8.50 / 21.59	10.97	2-3/8" 6P ACME - 2G	OR-N569-227	OR-B227-2405
2-7/8"	GN-R28-0035	5.25 / 13.34	8.50 / 21.59	12.14	2-1/2" 6P ACME - 2G	OR-N569-228	OR-B228-2560
3-3/8"	GN-R33-0035	5.25 / 13.34	8.13 / 20.65	15.46	2-13/16" 6P ACME - 2G	OR-N569-231	OR-B231-2870

Select o-ring material based on fluid compatibility and wellbore temperature.
*Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*

Conventional Subs
Booster to Booster Top Subs

GEODynamics' conventional gun connectors (subs) are used in TCP and conventional booster-to-booster perforating applications with GEODynamics' short guns (GLB series) or conventional long guns (GA series). All connections use double o-rings with optional back-up rings.

Booster to Booster Top Sub
GN-R31-0020 (shown)



Booster to Booster Top Sub
GN-R20-0020 (shown)

Mechanical Specifications											
Gun Size (OD)	Part Number	Length		Weight		Top Connection *(UH)*			Gun Connection *(DH)*		
		Makeup *(in/cm)*	Overall *(in/cm)*	*(lbs)*	*(kg)*	Thread	O-Rings *(2)*†	Back-Ups *(2)*	Thread	O-Rings *(2)*†	Back-Ups *(2)*
1-9/16"	GN-R16-0020	2.31 / 5.87	5.31 / 13.49	1.84	0.83	1-9/32" 12P STUB ACME-2G	-215	OR-B215-1308	1-9/32" 12P STUB ACME-2G	-215	OR-B215-1308
1-3/4"	GN-R175-0020	2.06 / 5.23	5.31 / 13.49	2.05	0.93				1-7/16" 12P STUB ACME-2G	-218	OR-B217-1468
2"	GN-R20-0020	2.06 / 5.23	5.31 / 13.49	2.72	1.23				1-11/16" 8P STUB ACME	-221	OR-B221-1715
2-3/8"	GN-R23-0020	1.81 / 4.60	5.31 / 13.49	3.82	1.73				2-1/32" 8P STUB ACME 2G	-225	OR-B225-2126
2-1/2"	GN-R25-0020	1.81 / 4.60	5.31 / 13.49	4.10	1.86				2-1/8" 8P ACME-2G	-225	OR-B225-2160
2-3/4"	GN-R27-0020	1.87 / 4.75	8.00 / 20.32	8.28	3.76	2-1/8" 8P ACME-2G	-225	OR-B225-2160	2-3/8" 6P ACME-2G	-227	OR-B227-2405
2-7/8"	GN-R28-0020	1.87 / 4.75	8.00 / 20.32	8.94	4.06				2-1/2" 6P ACME-2G	-228	OR-B228-2560
3-1/8"	GN-R31-0020	3.12 / 7.92	8.03 / 20.40	13.13	5.96	2-3/4" 6P ACME-2G	-230	OR-B230-2813	2-3/4" 6P ACME-2G	-230	OR-B230-2813
3-3/8"	GN-R33-0020	3.12 / 7.92	8.03 / 20.40	14.27	6.47				2-13/16" 6P ACME-2G	-231	OR-B231-2870
4"	GN-R40-0020	2.72 / 6.91	8.00 / 20.32	19.25	8.73				3-7/16" 6P ACME-2G	-236	OR-B236-3497
4-1/2" & 4-5/8"	GN-R45-0020	3.47 / 8.81	9.00 / 22.86	27.69	12.56				3-15/16" 6P ACME-2G	-342	OR-B342-3997
4-3/4"	GN-R475-0020	3.47 / 8.81	9.00 / 22.86	28.86	13.09				3-15/16" 6P ACME-2G	-342	OR-B342-3997
5"	GN-R50-0020	3.47 / 8.81	9.00 / 22.86	35.15	15.94				4-1/2" 6P ACME-2G	-346	OR-B346-4559
5-1/8"	GN-R51-0020	3.47 / 8.81	9.00 / 22.86	35.91	16.29				4-1/2" 6P ACME-2G	-346	OR-B346-4559
6-3/4"	GN-R675D20	4.47 / 11.35	10.00 / 25.40	61.07	27.70				5-3/4" 6P ACME-2G	-357	OR-B357-5873
7"	GN-R70-0020	3.47 / 8.81	9.00 / 22.86	62.12	28.18				6-1/4" 5P ACME-2G	-360	OR-B360-6309

Select o-ring material based on fluid compatibility and wellbore temperature.
*†Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*

Conventional Subs
Booster to Booster Tandem Subs

GEODynamics' conventional gun connectors (subs) are used in TCP and conventional booster-to-booster perforating applications with GEODynamics' short guns (GLB series) or conventional long guns (GA series). All connections use double o-rings with optional back-up rings.

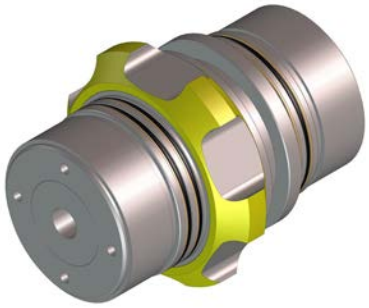
Booster to Booster Tandem Sub
GN-R45-0021 (shown)

Mechanical Specifications							
Gun Size (OD)	Part Number	Length		Weight (lbs/kg)	Gun Connections		
		Makeup (in/cm)	Overall (in/cm)		Thread	O-Rings (4)†	Back-Ups (4)
1-9/16"	GN-R16-0021	3.00 / 7.62	6.00 / 15.24	2.19 / 0.99	1-9/32" 12P STUB ACME-2G	-215	OR-B215-1308
1-3/4"	GN-R175-0021	2.50 / 6.35	6.00 / 15.24	2.57 / 1.17	1-7/16" 12P STUB ACME-2G	-218	OR-B217-1468
2"	GN-R20-0021	2.50 / 6.35	6.00 / 15.24	3.62 / 1.64	1-11/16" 8P STUB ACME	-221	OR-B221-1715
2-3/8"	GN-R23-0021	2.00 / 5.08	6.00 / 15.24	5.45 / 2.47	2-1/32" 8P STUB ACME 2G	-225	OR-B225-2126
2-1/2"	GN-R25-0021	2.00 / 5.08	6.00 / 15.24	5.86 / 2.66	2-1/8" 8P ACME-2G	-225	OR-B225-2160
2-3/4"	GN-R27-0021	2.46 / 6.25	8.96 / 22.76	10.35 / 4.69	2-3/8" 6P ACME-2G	-227	OR-B227-2405
2-7/8"	GN-R28-0021	2.46 / 6.25	8.96 / 22.76	11.56 / 5.24	2-1/2" 6P ACME-2G	-228	OR-B228-2560
3-1/8"	GN-R31-0021	3.20 / 8.13	8.96 / 22.76	14.64 / 6.64	2-3/4" 6P ACME-2G	-230	OR-B230-2813
3-3/8"	GN-R33-0021	3.20 / 8.13	8.96 / 22.76	16.18 / 7.34	2-13/16" 6P ACME-2G	-231	OR-B231-2870
4"	GN-R40-0021	2.40 / 6.10	8.90 / 22.61	23.37 / 10.60	3-7/16" 6P ACME-2G	-236	OR-B236-3497
4-1/2" & 4-5/8"	GN-R45-0021	2.90 / 7.37	9.90 / 25.15	33.71 / 15.29	3-15/16" 6P ACME-2G	-342	OR-B342-3997
4-3/4"	GN-R475-0021	2.90 / 7.37	9.90 / 25.15	34.87 / 15.82	3-15/16" 6P ACME-2G	-342	OR-B342-3997
5"	GN-R50-0021	2.90 / 7.37	9.90 / 25.15	44.29 / 20.09	4-1/2" 6P ACME-2G	-346	OR-B346-4559
5-1/8"	GN-R51-0021	2.90 / 7.37	9.90 / 25.15	44.90 / 20.37	4-1/2" 6P ACME-2G	-346	OR-B346-4559
7"	GN-R70-0021	2.90 / 7.37	9.90 / 25.15	88.06 / 39.94	6-1/4" 5P ACME-2G	-360	OR-B360-6309

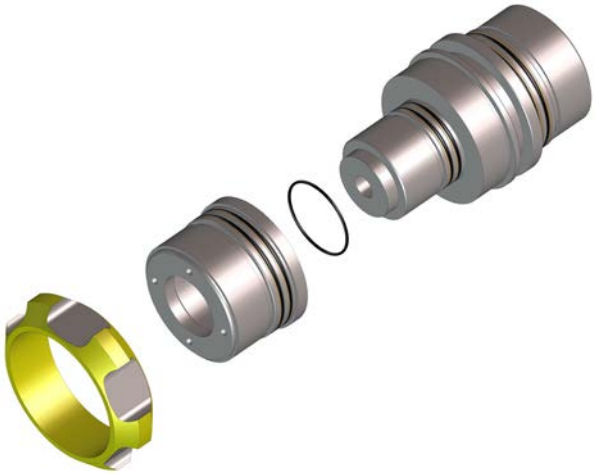
Select o-ring material based on fluid compatibility and wellbore temperature.
*†Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*

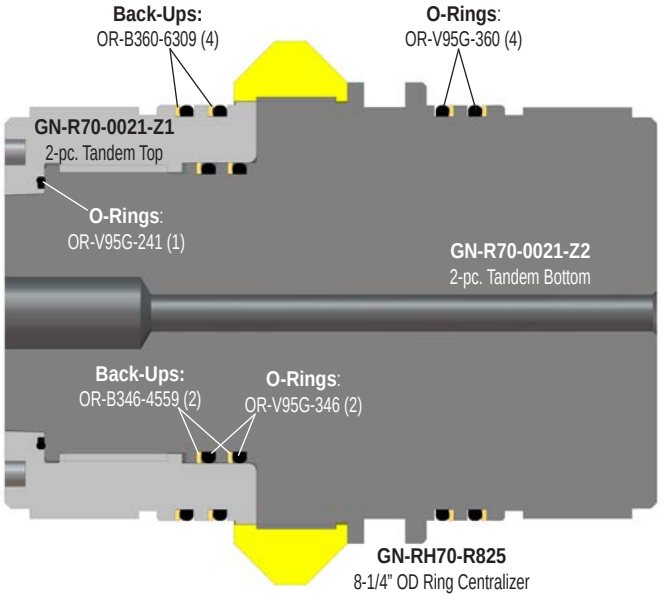
Conventional Subs
Booster to Booster Two-Piece Tandem Subs, 6-5/8", 6-3/4", and 7" Systems

GEODynamics' conventional gun connectors (subs) are used in TCP and conventional booster-to-booster perforating applications with GEODynamics' short guns (GLB series) or conventional long guns (GA series). All connections use double o-rings with optional back-up rings.



GN-R70-0021-Z825
2-pc. Tandem with
8-1/4" OD Ring Centralizer





SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R675D21-Z827-CT	6-3/4" 2 pc. Tandem Sub with 8-1/4" Ring Centralizer*	3.90	9.91	10.90	27.69	90.98	41.27
GN-R675D21-ZTL	6-3/4" 2 pc. Tandem Sub Wrench	N/A		24.00	60.96	5.50	2.49
GN-R70-0021-Z825	7" 2 pc. Tandem Sub with 8-1/4" Ring Centralizer*	2.50	6.35	9.90	25.15	90.52	41.06
GN-R70-0021-ZTL	7" 2 pc. Tandem Sub Wrench	N/A		24.00	60.96	6.00	2.72

Select o-ring material based on fluid compatibility and wellbore temperature.
*Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*
** Refer to Centralizing Gun Connectors catalog pages for additional details and centralizer options.*

GN-R70-0021-ZTL
Sub Wrench

Conventional Subs
Bull Plugs

GEODynamics' conventional gun connectors (subs) are used in TCP and conventional booster-to-booster perforating applications with GEODynamics' short guns (GLB series) or conventional long guns (GA series). All sub connections use double o-rings with optional back-up rings.

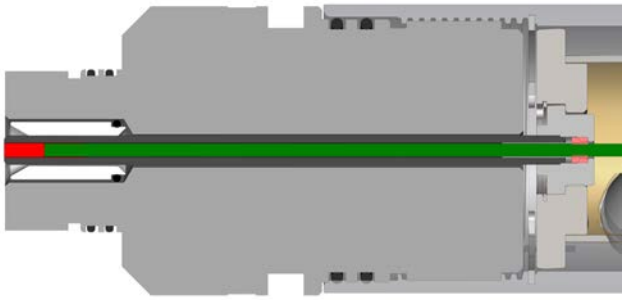
Bull Plug, Standard
GN-R31-0022 (shown)

Mechanical Specifications											
Gun Size (OD)	Part Numbers				Make-Up Length		Weight		Gun Connections		
	Standard	2-3/8" EU Pin	2-7/8" EU Pin	3-1/2" EU Pin	Standard *(in/cm)*	EU Pin *(in/cm)*	Standard *(lbs/kg)*	EU Pin *(lbs/kg)*	Thread	O-Rings *(4)*†	Back-Ups *(4)*
1-9/16"	GN-R16-0022	-	-	-	2.00 / 5.08	-	1.24 / 0.56	-	1-9/32" 12P STUB ACME-2G	-215	OR-B215-1308
1-3/4"	GN-R175-0022	-	-	-	1.75 / 4.45	-	1.41 / 0.64	-	1-7/16" 12P STUB ACME-2G	-218	OR-B217-1468
2"	GN-R20-0022	-	-	-	1.75 / 4.45	-	1.84 / 0.83	-	1-11/16" 8P STUB ACME	-221	OR-B221-1715
2-3/8"	GN-R23-0022	-	-	-	1.75 / 4.45	-	2.66 / 1.21	-	2-1/32" 8P STUB ACME 2G	-225	OR-B225-2126
2-1/2"	GN-R25-0022	-	-	-	1.75 / 4.45	-	2.91 / 1.32	-	2-1/8" 8P ACME-2G	-225	OR-B225-2160
2-3/4"	GN-R27-0022	GN-R27-0023	-	-	2.75 / 6.99	2.00 / 5.08	6.30 / 2.86	9.56 / 4.34	2-3/8" 6P ACME-2G	-227	OR-B227-2405
2-7/8"	GN-R28-0022	GN-R28-0023	-	-	2.75 / 6.99	2.00 / 5.08	7.08 / 3.21	10.33 / 4.69	2-1/2" 6P ACME-2G	-228	OR-B228-2560
3-1/8"	GN-R31-0022	GN-R31-0023	-	-	3.12 / 7.92	2.25 / 5.72	8.41 / 3.81	11.05 / 5.01	2-3/4" 6P ACME-2G	-230	OR-B230-2813
	-		GN-R31-0024	-	-	2.25 / 5.72	-	12.74 / 5.78	2-3/4" 6P ACME-2G	-230	OR-B230-2813
3-3/8"	GN-R33-0022	GN-R33-0023	-	-	3.12 / 7.92	2.25 / 5.72	9.48 / 4.30	11.90 / 5.40	2-13/16" 6P ACME-2G	-231	OR-B231-2870
	-		GN-R33-0024	-	-	2.00 / 5.08	-	13.13 / 5.96	2-13/16" 6P ACME-2G	-231	OR-B231-2870
4"	GN-R40-0022	-	GN-R40-0023	-	3.00 / 7.62	3.00 / 7.62	13.21 / 5.99	19.61 / 8.89	3-7/16" 6P ACME-2G	-236	OR-B236-3497
4-1/2" & 4-5/8"	GN-R45-0022	-	GN-R45-0023	-	3.00 / 7.62	2.50 / 6.35	18.62 / 8.45	22.66 / 10.28	3-15/16" 6P ACME-2G	-342	OR-B342-3997
	-			GN-R45-0024	-	2.25 / 5.72	-	23.93 / 10.85	3-15/16" 6P ACME-2G	-342	OR-B342-3997
4-3/4"	GN-R475-0022	-	GN-R475-0023	-	3.00 / 7.62	2.50 / 6.35	19.68 / 8.93	23.55 / 10.68	3-15/16" 6P ACME-2G	-342	OR-B342-3997
5"	GN-R50-0022	-	GN-R50-0023	-	3.00 / 7.62	2.75 / 6.99	25.03 / 11.35	29.38 / 13.33	4-1/2" 6P ACME-2G	-346	OR-B346-4559
5-1/8"	GN-R51-0022	-	GN-R51-0023	-	3.00 / 7.62	2.75 / 6.99	25.56 / 11.59	29.86 / 13.54	4-1/2" 6P ACME-2G	-346	OR-B346-4559
6-3/4"	GN-R675D22	-	GN-R675D23	-	3.00 / 7.62	2.75 / 6.99	42.89 / 19.45	45.93 / 20.83	5-3/4" 6P ACME-2G	-357	OR-B357-5873
7"	GN-R70-0022	-	GN-R70-0023	-	3.00 / 7.62	2.75 / 6.99	48.64 / 22.06	51.49 / 23.36	6-1/4" 5P ACME-2G	-360	OR-B360-6309
	-			GN-R70-0024	-	2.75 / 6.99	-	54.79 / 24.85	6-1/4" 5P ACME-2G	-360	OR-B360-6309

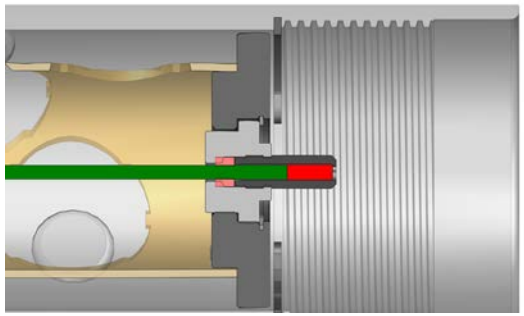
Select o-ring material based on fluid compatibility and wellbore temperature.
*†Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*

TRANSFER KIT COMPONENTS

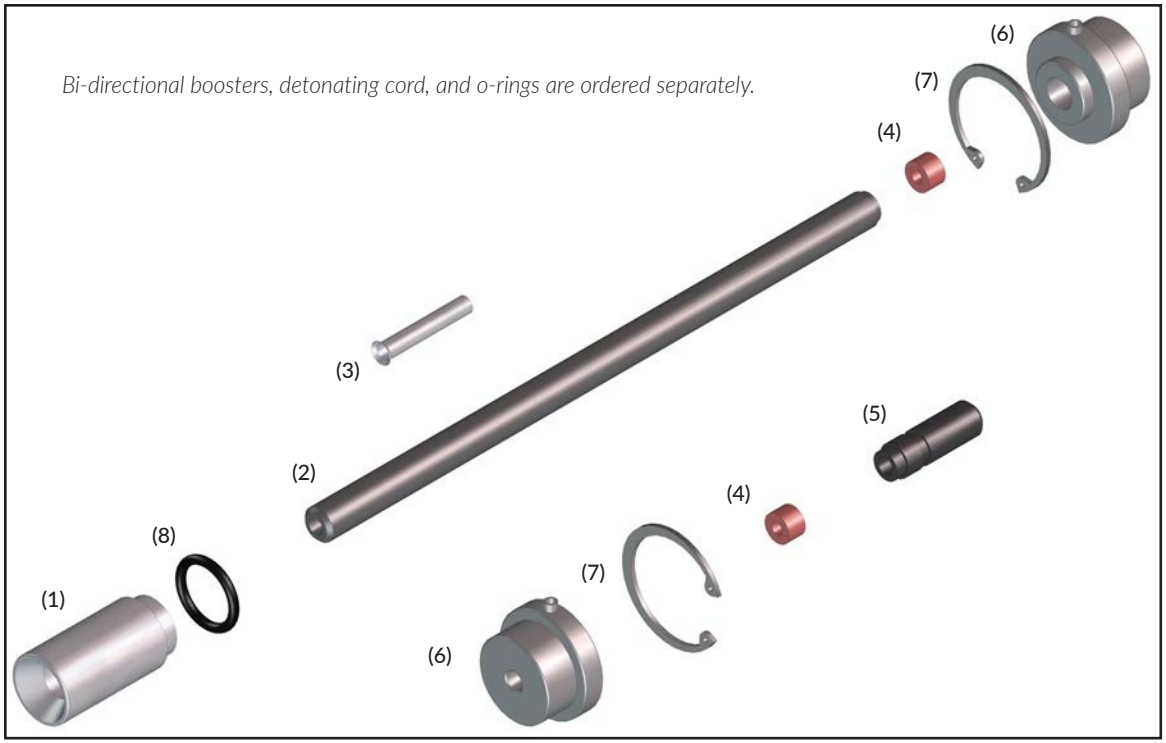
Gun Size (OD)	Kit Part Number	(1)	(2)		(3)	(4)	(5)		(6)	(7)	(8)
		TCP Sub Insert	Transfer Tube	Length	Crimp Tube	Grommet (2)	Booster Retainer	Length	TCP Insert Body (2)	Snap Ring (2)	O-Ring
1-9/16” - 2-1/2” OD	GN-020-0100	N/A	GN-020-0051	6.00”	GN-000-0003	GN-000-0004	GN-000-1517	1.00”	GN-000-1515	N/A	OR-N569-021
	GN-020-0100HT	N/A	GN-020-0051HT	6.00”	GN-000-0003	GN-000-0004	GN-000-1517HT	1.00”	GN-000-1515	N/A	OR-V95G-021
2-3/4” - 4” OD	GN-000-0025	GN-000-0006	GN-000-0001	8.75”	GN-000-0003	GN-000-0004	GN-000-0005	1.53”	GN-020-0001	N5000-156	OR-N569-211
	GN-000-0025HT	GN-000-06HT	GN-000-01HT	8.75”	GN-000-0003	GN-000-0004	GN-000-05HT	1.53”	GN-020-0001	N5000-156	OR-V569-211
4-1/2” & Larger OD	GN-000-0030	GN-000-0006	GN-000-0002	9.75”	GN-000-0003	GN-000-0004	GN-000-0005	1.53”	GN-020-0001	N5000-156	OR-N569-211
	GN-000-0030HT	GN-000-06HT	GN-000-02HT	9.75”	GN-000-0003	GN-000-0004	GN-000-05HT	1.53”	GN-020-0001	N5000-156	OR-V569-211
6-3/4” HPHF	GN-000-0035	GN-000-0006	GN-000-22HT	10.75”	GN-000-0003	GN-000-0004	GN-000-19HT	2.03”	GN-020-0001	N5000-156	OR-N569-211
	GN-000-0035HT	GN-000-06HT	GN-000-22HT	10.75”	GN-000-0003	GN-000-0004	GN-000-19HT	2.03”	GN-020-0001	N5000-156	OR-N569-211
6-5/8” HPHF	GN-000-0036	GN-000-0006	GN-000-22HT	10.75”	GN-000-0003	GN-000-0004	GN-000-0005	1.53”	GN-020-0001	N5000-156	OR-N569-211
	GN-000-0036HT	GN-000-06HT	GN-000-22HT	10.75”	GN-000-0003	GN-000-0004	GN-000-05HT	1.53”	GN-020-0001	N5000-156	OR-N569-211



Transfer kit components installed in top sub with detonator and detonating cord.



Transfer kit components installed in bottom of carrier with detonator and detonating cord.



Please contact your sales representative for high-temperature and high-pressure applications.

Revised: August 20, 2025 12:34 PM

Centralizing Gun Connectors (Booster to Booster)
3-1/8” and 3-3/8” Conventional Gun Systems

GEODynamics

GEODynamics’ centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Centralizer options available from 3.88 to 6.38 inches OD. Custom sizes available by special order.

Centralizing Tandem Sub
GN-R33-0021HB

shown with

4.42” OD Extended Ring Centralizer
GN-R33HB-R442E

4.42” OD Ring Centralizer
GN-R33HB-R442S

SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R31-0021HB	3-1/8” Centralizing Tandem Sub	3.20	8.13	8.96	22.76	14.52	6.59
GN-R33-0021HB	3-3/8” Centralizing Tandem Sub	3.20	8.13	8.96	22.76	15.28	6.93
GN-R33-0023HB	3-3/8” Centralizing Bull Plug, 2-3/8” EUE Pin	2.75	6.99	8.38	21.29	12.11	5.49
GN-R33HB-R442S	3-1/8” and 3-3/8” Ring Centralizer, 4.42” OD	N/A		2.00	5.08	2.17	0.98
GN-R33HB-R442E	3-1/8” and 3-3/8” Extended Ring Centralizer, 4.42” OD	N/A		3.00	7.62	3.04	1.38
GN-R3121-C638	3-1/8” Finned Centralizing Tandem, 6-3/8” OD	3.20	8.13	8.96	22.76	19.13	8.68
GN-R3321-C388	3-3/8” Finned Centralizing Tandem, 3-7/8” OD	3.20	8.13	8.96	22.76	16.49	7.48
GN-R3321-C638	3-3/8” Finned Centralizing Tandem, 6-3/8” OD	3.20	8.13	8.96	22.76	20.24	9.18
GN-R3322-C388	3-3/8” Finned Centralizing Bull Plug, 3-7/8” OD	3.12	7.92	6.00	15.24	9.91	4.50

*Select o-ring material based on fluid compatibility and wellbore temperature. Nitrile (OR-N569-***) is the standard option.*
*Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*
Centralizer rings have internal 3.20 in -6P Stub ACME 2G internal threads (2.0 in. wide)

6-3/8” OD Centralizing Tandem
GN-R3321-C638

Revised: August 20, 2025 12:34 PM

Centralizing Gun Connectors (Booster to Booster)
4-1/2” and 4-5/8” Conventional Gun Systems

GEODynamics

GEODynamics’ centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Centralizer options available from 5.50 to 8.50 inches OD. Custom sizes available by special order.

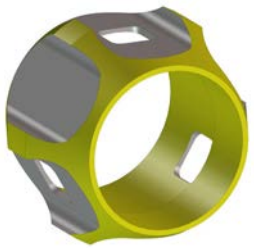
Centralizing Tandem Sub
GN-R45-0021HB

shown with

6-1/4” OD Extended Ring Centralizer
GN-RH450-R625-EXT

SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R45-0021HB	4-1/2” Centralizing Tandem Sub	2.90	7.37	9.90	25.15	33.52	15.20
GN-R45-0022HB	4-1/2” Centralizing Bull Plug	3.00	7.62	6.50	16.51	17.93	8.13
GN-R45-0023HB	4-1/2” Centralizing Bull Plug, 2-7/8” EUE Pin	2.76	7.01	10.62	26.97	27.65	12.54
GN-RH450-R625-EXT	4-1/2” Extended Ring Centralizer, 6-1/4” OD	N/A		4.50	11.43	5.62	2.55
GN-RH45CR1-R****	4-1/2” Ring Centralizer, 5-1/2” to 8-1/2” OD	*Refer to Ring Centralizer Specifications (next page)*					
GN-R4621-C600	4-5/8” Finned Cent. Tandem, 6-1/4” OD, 1/2” Drift	2.90	7.37	9.90	25.15	36.38	16.50
GN-R4622-C600	4-5/8” Finned Cent. Bull Plug, 6-1/4” OD, 1/2” Drift	3.56	9.04	7.06	17.93	22.96	10.41

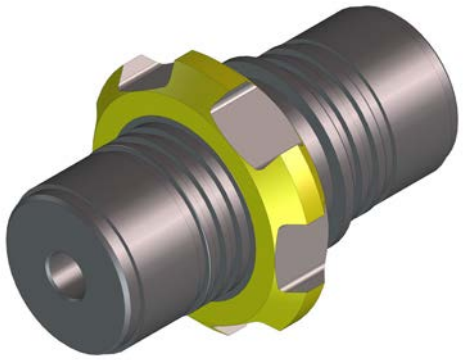


Select o-ring material based on fluid compatibility and wellbore temperature. Nitrile (OR-N569-342) is the standard option. Viton (OR-V95-342) with back-up rings (OR-B342-3997) required at temperatures above 325°F.

RING CENTRALIZER SPECIFICATIONS

Part Number *4140 Material*	OD		Weight	
	(in)	*(cm)*	*(lbs)*	*(kg)*
GN-RH45CR1-R550	5.50	13.97	2.4	1.09
GN-RH45CR1-R575	5.75	14.61	2.5	1.13
GN-RH45CR1-R594	5.94	15.09	2.6	1.18
GN-RH45CR1-R600	6.00	15.24	2.6	1.18
GN-RH45CR1-R612	6.12	15.54	3.1	1.41
GN-RH45CR1-R625	6.25	15.88	3.6	1.63
GN-RH45CR1-R637	6.37	16.18	4.1	1.86
GN-RH45CR1-R650	6.50	16.51	4.6	2.09
GN-RH45CR1-R675	6.75	17.15	5.7	2.59
GN-RH45CR1-R700	7.00	17.78	6.8	3.08
GN-RH45CR1-R725	7.25	18.42	8.0	3.63
GN-RH45CR1-R750	7.50	19.05	9.2	4.17
GN-RH45CR1-R775	7.75	19.69	10.4	4.72
GN-RH45CR1-R800	8.00	20.32	11.7	5.31
GN-RH45CR1-R825	8.25	20.96	13.0	5.90
GN-RH45CR1-R850	8.50	21.59	14.4	6.53

1018 material also available; add an “M” to the part number, e.g. GN-RH45CR1-R650M.
Centralizer rings are 1.60 in. wide with 4.30 in. -6P Stub ACME 2G internal threads.



Centralizing Tandem Sub
GN-R45-0021HB

shown with

Ring Centralizer
GN-RH45CR1-R625

Centralizing Gun Connectors (Booster to Booster)
4-3/4" Conventional Gun Systems

GEODynamics' centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Available centralizers are 6.25 inches OD. Custom sizes available by special order.

Centralizing Tandem Sub
GN-R475-0021HB

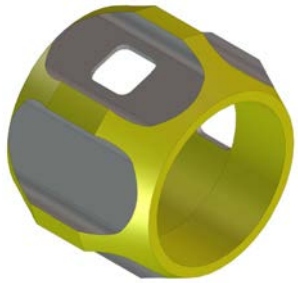
shown with

6-1/4 OD Extended Ring Centralizer
GN-RH475-R625-EXT

SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R475-0021HB	4-3/4" Centralizing Tandem Sub	2.90	7.37	9.90	25.15	33.86	15.36
GN-R47523-C625	4-3/4" Finned Centralizing BP, 6-1/4" OD, 2-7/8" EUE Pin	3.75	9.53	10.00	25.40	32.12	14.57
GN-RH475-R625-EXT	4-3/4" Extended Ring Centralizer, 6-1/4" OD	N/A		4.50	11.43	6.72	3.05

Select o-ring material based on fluid compatibility and wellbore temperature. Nitrile (OR-N569-342) is the standard option.
Viton (OR-V95-342) with back-up rings (OR-B342-3997) required at temperatures above 325°F.
Centralizer rings have internal 4.30 in. -6P Stub ACME 2G internal threads (1.61 in. wide)



6-1/4" OD Extended Ring Centralizer
GN-RH475-R625-EXT

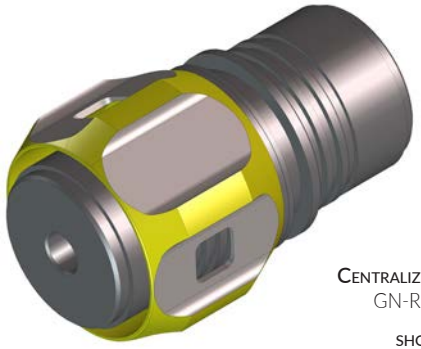
Centralizing Gun Connectors (Booster to Booster)
5-1/8” Conventional Gun Systems

GEODynamics

GEODynamics’ centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Centralizer options available from 5.90 to 8.129 inches OD. *(Refer to specifications on next page.)* Custom sizes available by special order.



Centralizing Tandem Sub
GN-R51-0021HB

shown with

6-3/8 OD Extended Ring Centralizer
GN-RH51-R638-EXT

SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R51-0021HB	5-1/8” Centralizing Tandem Sub	2.90	7.37	9.90	25.15	44.46	20.17
GN-R51-0022HB	5-1/8” Centralizing Bull Plug	1.39	3.53	6.50	16.51	24.90	11.29
GN-R51-0023HES	5-1/8” Centralizing Bull Plug, 2-7/8” 8 EU RD STD API Pin	4.20	10.67	10.58	26.87	34.00	15.42
GN-R5121-C625	5-1/8” Finned Centralizing Tandem Sub, 6-1/4” OD	2.90	7.37	9.90	25.15	46.36	21.03
GN-R5122-C625	5-1/8” Finned Centralizing Bull Plug, 6-1/4” OD	3.81	9.68	7.31	18.57	30.03	13.62
GN-R5123-C625	5-1/8” Finned Centralizing BP, 6-1/4” OD, 2-7/8” EUE Pin	3.25	8.26	9.50	24.13	34.71	15.74

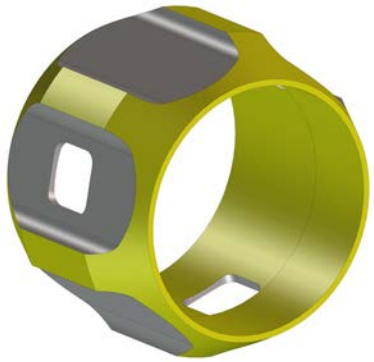
Select o-ring material based on fluid compatibility and wellbore temperature. Nitrile (OR-N569-346) is the standard option. Viton (OR-V95-346) with back-up rings (OR-B346-4559) required at temperatures above 325°F.

RING CENTRALIZER SPECIFICATIONS

Part Number	OD		Weight	
	(in)	*(cm)*	*(lbs)*	*(kg)*
GN-RH51-R590	5.90	14.99	1.70	0.77
GN-RH51-R638	6.375	16.19	2.89	1.31

Centralizer rings are 1.62 in. wide with 5.0 in. -6P Stub ACME 2G internal threads.

6-3/8” OD Ring Centralizer
GN-RH51-R638

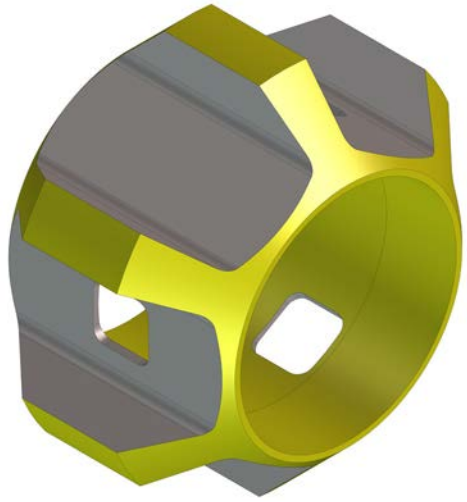


6-3/8” OD Extended Ring Centralizer
GN-RH51-R638-EXT

EXTENDED RING CENTRALIZER SPECIFICATIONS

Part Number	OD		Width		Weight	
	(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-RH51-R625-EXT	6.25	15.88	4.50	11.43	6.00	2.72
GN-RH51-R638-EXT	6.375	16.19	4.50	11.43	6.19	2.81
GN-RH51-R813-EXT	8.129	20.65	5.00	12.70	11.67	5.29

Centralizer rings have internal 5.0 in. -6P Stub ACME 2G internal threads (1.58 in. wide).



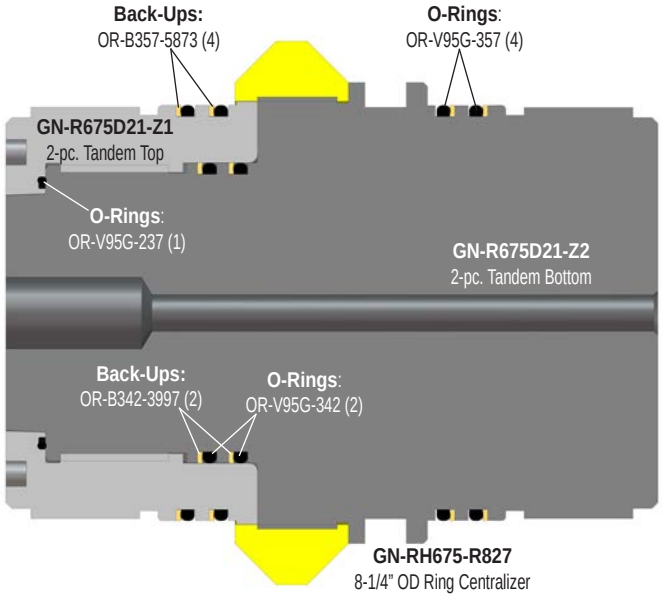
8.129” OD Extended Ring Centralizer
GN-RH51-R813-EXT

Centralizing Gun Connectors (Booster to Booster)
6-5/8" and 6-3/4" Conventional Gun Systems

GEODynamics' centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Available centralizers are 8.25 inches OD. Custom sizes available by special order.



Sub Wrench
GN-R675D21-ZTL

SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R675-0020-EXP	6-3/4" Centralizing Top Sub *(5-3/4" 6P Acme 2G THD)*	3.47	8.81	9.00	22.86	54.93	24.92
GN-R675D21-Z827-CT	6-3/4" 2 pc. Tandem Sub with 8-1/4" Ring Centralizer	3.90	9.91	10.90	27.69	90.98	41.27
GN-RH675-R827	6-3/4" Ring Centralizer, 8-1/4" OD, 2-1/4" wide *(6-5/16" 6P Stub Acme 2G THD)*	N/A		N/A		7.42	3.37
GN-R67523-C825	6-3/4" Bull Plug w/8-1/4" Centralizer, 2-7/8" EUE Pin	3.75	9.53	10.00	25.40	53.00	24.04
GN-R67524-C825	6-3/4" Bull Plug w/8-1/4" Centralizer, 3-1/2" EUE Pin	3.75	9.53	10.25	26.04	59.00	26.16
GN-R675D21-ZTL	6-3/4" 2 pc. Tandem Sub Wrench	N/A		24.00	60.96	5.50	2.49

Select o-ring material based on fluid compatibility and wellbore temperature.
*Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*

2-pc. Tandem with
8-1/4" OD Ring Centralizer
GN-R675D21-Z827-CT

Centralizing Gun Connectors (Booster to Booster)
7” Conventional Gun Systems

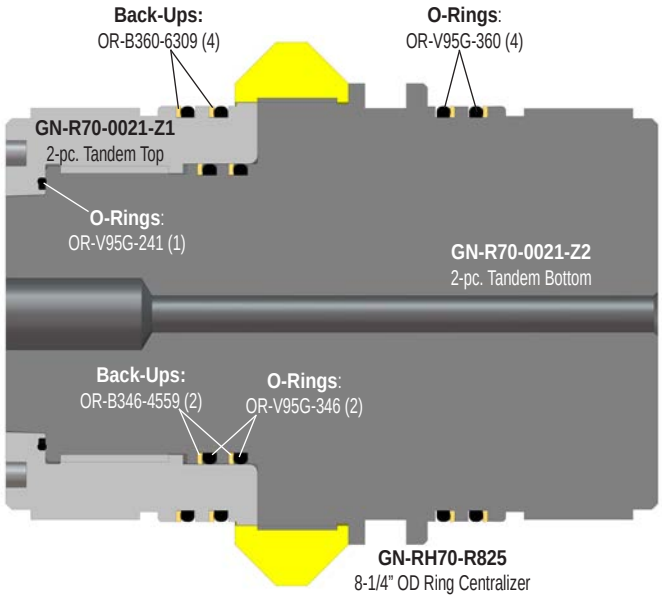
GEODynamics

GEODynamics’ centralizing gun connectors are used to position the perforating string in the wellbore. The centralizers reduce friction between the perforating guns and the casing, which minimizes the risk of the string getting caught while running into or pulling out of the well. Centralizers enhance deployment capabilities of slickline, wireline, coiled tubing, and jointed pipe. In TCP operations with deviated wells, the centralized connectors provide greater assurance that the guns will fall to total depth after they have been released.

FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run in conjunction with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post detonation swell.
- Tensile strength is equivalent to standard gun connectors.
- Centralizer options available from 7.0 to 12.0 inches OD. Custom sizes available by special order.

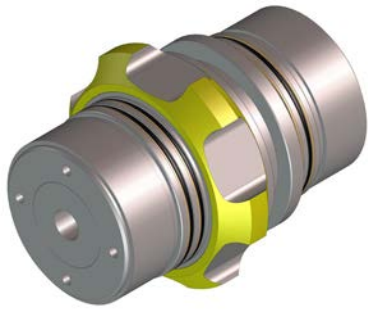
Sub Wrench
GN-R70-0021-ZTL



SPECIFICATIONS

Part Number	Description	Makeup Length		Overall Length		Weight	
		(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-R70-0021-Z825	7” 2 pc. Tandem Sub with 8-1/4” Ring Centralizer	2.50	6.35	9.90	25.15	90.52	41.06
GN-RH70-R****	7” Ring Centralizer, 7” to 9” OD	*Refer to Ring Centralizer Specifications (next page)*					
GN-RH70-R****-EXT	7” Extended Ring Centralizer, 8-1/4” to 12” OD	*Refer to Extended Ring Centralizer Specs (next page)*					
GN-R70-0021-ZTL	7” 2 pc. Tandem Sub Wrench	N/A		24.00	60.96	6.00	2.72

Select o-ring material based on fluid compatibility and wellbore temperature.
*Nitrile (OR-N569-***) is the standard option. Viton (OR-V95-***) with back-up rings required at temperatures above 325°F.*



2-pc. Tandem with
8-1/4” OD Ring Centralizer
GN-R70-0021-Z825

Revised: August 20, 2025 12:34 PM

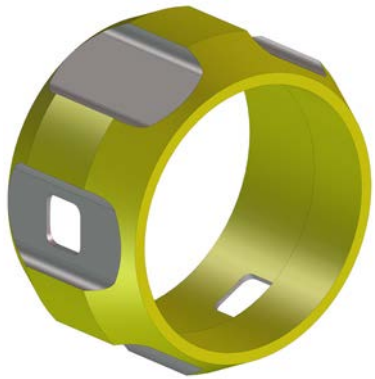
Patents: www.perf.com/patents

RING CENTRALIZER SPECIFICATIONS

Part Number	OD		Weight	
	(in)	*(cm)*	*(lbs)*	*(kg)*
GN-RH70-R700	7.00	17.78	2.89	1.31
GN-RH70-R825	8.25	20.96	4.63	2.10
GN-RH70-R850	8.50	21.59	6.09	2.76
GN-RH70-R900	9.00	22.86	6.89	3.13

Centralizer rings are 1.72 in. wide with 6.533 in. -6P Stub ACME 2G internal threads.

9” OD Ring Centralizer
GN-RH70-R900

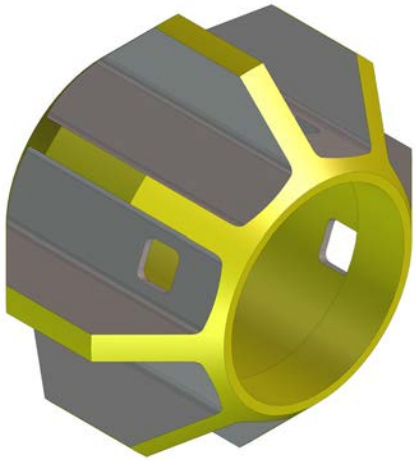


8-1/4” OD Extended Ring Centralizer
GN-RH70-R825-EXT

EXTENDED RING CENTRALIZER SPECIFICATIONS

Part Number	OD		Width		Weight	
	(in)	*(cm)*	*(in)*	*(cm)*	*(lbs)*	*(kg)*
GN-RH70-R825-EXT	8.25	20.96	4.50	11.43	11.35	5.15
GN-RH70-R1037-EXT	10.37	26.34	7.50	19.05	31.43	14.26
GN-RH70-R1195-EXT	11.95	30.35	8.00	20.32	40.67	18.45
GN-RH70-R1195-4-EXT	11.95	30.35	8.00	20.32	29.55	13.40

Centralizer rings have internal 6.533 in. -6P Stub ACME 2G internal threads (1.72 in. wide)



12” OD Extended Ring Centralizer
GN-RH70-R1195-EXT

Centralizing Break-Apart Tandem Sub (Booster to Booster)
4-1/2”, 4-5/8”, and 4-3/4” Conventional Gun Systems

GEODynamics

GEODynamics’ centralizing break-apart tandem sub connectors are used to position the perforating string in the wellbore while providing the capability to separate the perforating guns should it become necessary. While offering all the benefits of centralizing tandems, the break-apart option provides a secondary benefit. The break-apart tandem allows us to separate long gun assemblies into shorter sections if they become stuck (sanded up). This feature facilitates fishing/wash over operations. Right-hand rotation, with the appropriate torque, separates the tandem at the left-hand thread. If the perforating guns are not stuck, the break-apart feature cannot be deployed.

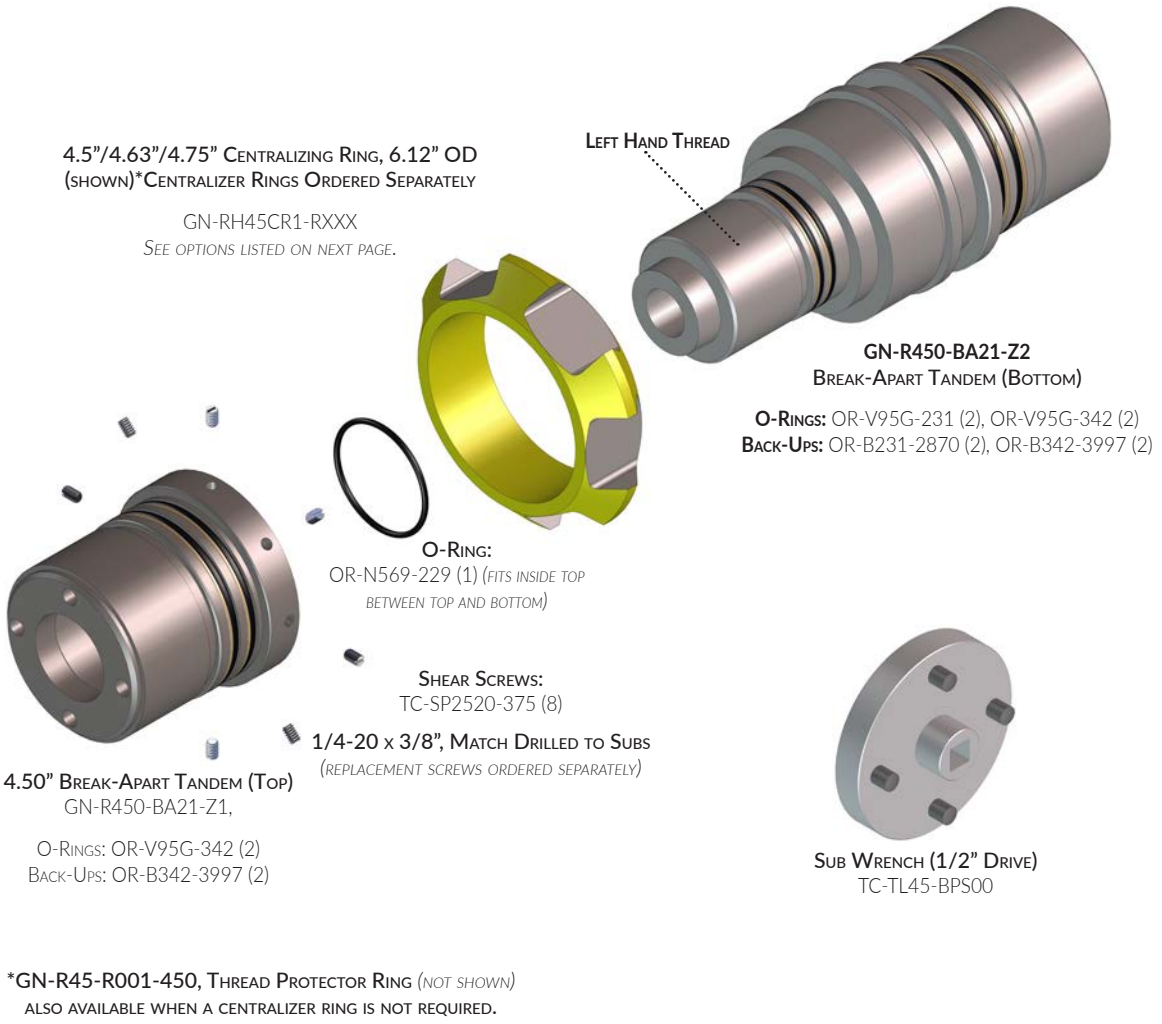
FEATURES/BENEFITS

- Economical, simple, safe, and reliable.
- Can be run with most GEODynamics gun systems.
- Enhances deployment capability of gun systems in highly-deviated and horizontal wells.
- Enhances ability of perforating guns to fall when used in conjunction with mechanical and automatic releases in highly-deviated wells.
- No post-detonation swell.
- Custom centralizer sizes (OD) available by special order.

SPECIFICATIONS

Part Number	GN-R45BA21-ZR
Booster Kit Part Number	GN-000-0035
Makeup Length	3.90 in / 9.91 cm
Overall Length	10.90 in / 27.69 cm
Weight	41.01 lbs / 18.60 kg
Tensile Rating	450,000 lbs *(higher than the carrier)*
Torque Required to Shear *(8 Screws)*	4,000 - 4,500 ft/lbs
Rotations Required to Shear	11 Rotations *(to the right)*
Upper/Lower Thread Connections	3-15/16” 6P ACME-2G

Select o-ring material based on fluid compatibility and wellbore temperature.
*Nitrile (OR-N569-***) is the standard option.*
*Viton (OR-V95-***) w/back-up rings required at temperatures above 325°F.*



*GN-R45-R001-450, Thread Protector Ring *(not shown)*
also available when a centralizer ring is not required.

RING CENTRALIZER SPECIFICATIONS

Part Number *4140 Material*	Part Number *1018 Material*	OD		Weight	
		(in)	*(cm)*	*(lbs)*	*(kg)*
GN-RH45CR1-R550	GN-RH45CR1-R550M	5.50	13.97	2.4	1.09
GN-RH45CR1-R575	GN-RH45CR1-R575M	5.75	14.61	2.5	1.13
GN-RH45CR1-R594	GN-RH45CR1-R594M	5.94	15.09	2.6	1.18
GN-RH45CR1-R600	GN-RH45CR1-R600M	6.00	15.24	2.6	1.18
GN-RH45CR1-R612	GN-RH45CR1-R612M	6.12	15.54	3.1	1.41
GN-RH45CR1-R625	GN-RH45CR1-R625M	6.25	15.88	3.6	1.63
GN-RH45CR1-R637	GN-RH45CR1-R637M	6.37	16.18	4.1	1.86
GN-RH45CR1-R650	GN-RH45CR1-R650M	6.50	16.51	4.6	2.09
GN-RH45CR1-R675	GN-RH45CR1-R675M	6.75	17.15	5.7	2.59
GN-RH45CR1-R700	GN-RH45CR1-R700M	7.00	17.78	6.8	3.08
GN-RH45CR1-R725	GN-RH45CR1-R725M	7.25	18.42	8.0	3.63
GN-RH45CR1-R750	GN-RH45CR1-R750M	7.50	19.05	9.2	4.17
GN-RH45CR1-R775	GN-RH45CR1-R775M	7.75	19.69	10.4	4.72
GN-RH45CR1-R800	GN-RH45CR1-R800M	8.00	20.32	11.7	5.31
GN-RH45CR1-R825	GN-RH45CR1-R825M	8.25	20.96	13.0	5.90
GN-RH45CR1-R850	GN-RH45CR1-R850M	8.50	21.59	14.4	6.53

Centralizer rings are 1.60 in. wide with 4.30 in. -6P Stub ACME 2G internal threads.

CENTRALIZING RING, 6.25" OD (*SHOWN*)
GN-RH45CR1-R625

Gun System Thread Protectors
Handling Protectors Only - Not for Lifting

Thread protectors with handles facilitate easy and safe handling of assembled gun systems, carriers, tandems, and bull plugs.

Double o-rings provide a reliable moisture seal. The melt plug is equipped with an o-ring and sealed in place with silicone. When the melt plug or its o-ring becomes damaged, GEODynamics recommends replacement of the entire melt plug.

Thread protectors are **not for lifting and rigging; lift subs are required** for these operations.

STANDARD THREAD PROTECTORS, O-RINGS, and MELT PLUGS

System Size	Carrier (Gun) Protector	Top Sub (Top Pin) Protector	Tandem/Switch Sub and Bull Plug Protector	O-Ring (Two per Sub (Pin End))	Melt Plug
1-9/16”	GN-THD-156-000	GN-THD-156-020	GN-THD-156-020	OR-N569-215	GN-THD-000-020
1-3/4”	GN-THD-175-000	GN-THD-156-020	GN-THD-175-020	OR-N569-218	GN-THD-000-020
2”	GN-THD-200-000	GN-THD-156-020	GN-THD-200-020	OR-N569-221	GN-THD-000-020
2-3/8”	GN-THD-239-030	GN-THD-156-020	GN-THD-239-040	OR-N569-225	GN-THD-000-028
2-1/2”	GN-THD-250-030	GN-THD-156-020	GN-THD-250-040	OR-N569-225	GN-THD-000-028
2-3/4”	GN-THD-275-030	GN-THD-QC27-020	GN-THD-275-040	OR-N569-227	GN-THD-000-028
2-7/8”	GN-THD-288-030	GN-THD-QC27-020	GN-THD-288-040	OR-N569-228	GN-THD-000-028
3-1/8”	GN-THD-312-030	GN-THD-312-020	GN-THD-312-040	OR-N569-230	GN-THD-000-028
3-3/8”	GN-THD-338-030	GN-THD-312-020	GN-THD-338-040	OR-N569-231	GN-THD-000-028
4”	GN-THD-400-030	GN-THD-312-020	GN-THD-400-040	OR-N569-236	GN-THD-000-028
4-1/2”	GN-THD-450-030	GN-THD-312-020	GN-THD-450-040	OR-N569-342	GN-THD-000-028
4-5/8”	GN-THD-450-030	GN-THD-312-020	GN-THD-450-040	OR-N569-342	GN-THD-000-028
5”	GN-THD-512-030	GN-THD-312-020	GN-THD-512-040	OR-N569-346	GN-THD-000-028
5-1/8”	GN-THD-512-030	GN-THD-312-020	GN-THD-512-040	OR-N569-346	GN-THD-000-028
7”	GN-THD-700-030	GN-THD-312-020	GN-THD-700-040	OR-N569-360	GN-THD-000-028

Melt Plug
GN-THD-000-020
Sizes 1-9/16” - 2”

Melt Plug w/O-Ring
GN-THD-000-028
Sizes 2-3/8” - 7”
Includes 70-Duro #120 O-Ring

Carrier (Gun) Protector
Equipped with Melt Plug and O-Rings

HANDLING PROTECTORS ONLY
NOT FOR LIFTING

Top Sub (Top Pin), Tandem/Switch Sub, and Bull Plug Protector
Equipped with Melt Plug

Revised: August 20, 2025 12:34 PM

LIFT SUB ASSEMBLY COMPONENTS

Assembly P/N	Description	Lift Cap P/N	Joint P/N	Coupling P/N
TC-LT15-000	Lift Sub Assembly, 1-9/16" Tandem, 1-3/4", 2-1/8", and 2-1/2" Top Sub	TC-LT00-238	TC-PUP23-002N 2-3/8", 4.7#/ft, N-80	TC-LT15-003
TC-LT175-000	Lift Sub Assembly, 1-3/4" Tandem			TC-LT175-003
TC-LT21-000	Lift Sub Assembly, 2-1/8" Tandem			TC-LT21-003
TC-LT25-000	Lift Sub Assembly, 2-1/2" Tandem			TC-LT25-003
TC-LT27-QC0	Lift Sub Assembly, 2-3/4" & 2-7/8" Top Sub			TC-LT27-QC3
TC-LT27-000	Lift Sub Assembly, 2-3/4" Tandem			TC-LT27-003
TC-LT28-000	Lift Sub Assembly, 2-7/8" Tandem			TC-LT28-003
TC-LT31-000	Lift Sub Assembly, 3-1/8" Tandem & Top Sub		TC-PUP23-602P 2-3/8", 6.5#/ft, P-110	TC-LT31-003
TC-LT33-000	Lift Sub Assembly, 3-3/8" Tandem			TC-LT33-003
TC-LT40-000	Lift Sub Assembly, 4" Tandem			TC-LT40-003
TC-LT45-000	Lift Sub Assembly, 4-1/2" & 4-5/8" Tandem	TC-LT00-288	TC-PUP28-902P 2-7/8," 8.7#/ft, P-110	TC-LT45-003
TC-LT51-000	Lift Sub Assembly, 5-1/8" Tandem			TC-LT51-003
TC-LT675-000	Lift Sub Assembly, 6-3/4"" Tandem			TC-LT675-003
TC-LT70-000	Lift Sub Assembly, 7" Tandem			TC-LT70-003

COUPLING SPECIFICATIONS

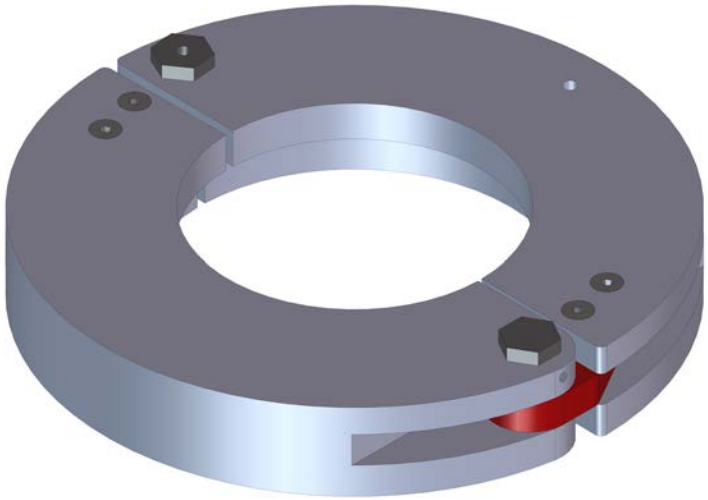
Coupling P/N	Description	Uphole Thread	Downhole Thread
TC-LT15-003	Coupling, Tandem Lift Sub, 1-9/16"	2-3/8" EU (8 Rnd)	1-9/32" 12P STUB ACME-2G
TC-LT175-003	Coupling, Tandem Lift Sub, 1-3/4"		1-7/16" 12P STUB ACME-2G
TC-LT21-003	Coupling, Tandem Lift Sub, 2-1/8"		1-11/16" - 8P STUB ACME-2G
TC-LT25-003	Coupling, Tandem Lift Sub, 2-1/2"		2-1/8" - 8P ACME-2G
TC-LT27-QC3	Coupling, 2-3/4" & 2 7/8" Top Lift Sub		2-1/8" - 6P ACME-2G
TC-LT27-003	Coupling, Tandem Lift Sub, 2-3/4"		2-3/8" - 6P ACME-2G
TC-LT28-003	Coupling, Tandem Lift Sub, 2-7/8"		2-1/2" - 6P ACME-2G
TC-LT31-003	Coupling, Tandem Lift Sub, 3-1/8"		2-3/4" - 6P ACME-2G
TC-LT33-003	Coupling, Tandem Lift Sub, 3-3/8"		2-13/16" - 6P ACME-2G
TC-LT40-003	Coupling, Tandem Lift Sub, 4"		3-9/16" - 6P ACME-2G
TC-LT45-003	Coupling, Tandem Lift Sub, 4-1/2"	2-7/8" EU (8 Rnd)	3-15/16" - 6P ACME-2G
TC-LT51-003	Coupling, Tandem Lift Sub, 5-1/8"		4-1/2" - 6P ACME-2G
TC-LT675-003	Coupling, Tandem Lift Sub, 6-3/4"		5-3/4"-6P ACME-2G
TC-LT70-003	Coupling, Tandem Lift Sub, 7"		6-1/4" - 5P ACME 2G

Lift Sub Assembly, 4-1/2 & 4-5/8" Tandem
TC-LT45-000 (shown)

LIFTING CLAMP ASSEMBLIES

Assembly P/N	Description	† Safe Working Load (lbs)	† Shear Rating (lbs)
TC-LC-0288-0000	Lifting Clamp Assembly, 2-7/8”	105,000	345,000
TC-LC-0313-0000	Lifting Clamp Assembly, 3-1/8”	115,000	375,000
TC-LC-0338-0000	Lifting Clamp Assembly, 3-3/8”	125,000	400,000
TC-LC-0400-0000	Lifting Clamp Assembly, 4”	150,000	480,000
TC-LC-0450-0000	Lifting Clamp Assembly, 4-1/2”	170,000	540,000
TC-LC-0462-0000	Lifting Clamp Assembly, 4-5/8”	174,000	550,000
TC-LC-0475-0000	Lifting Clamp Assembly, 4-3/4”	175,000	575,000
TC-LC-0513-0000	Lifting Clamp Assembly, 5-1/8”	190,000	620,000
TC-LC-0675-0000	Lifting Clamp Assembly, 6-3/4”	255,000	815,000
TC-LC-0700-0000	Lifting Clamp Assembly, 7”	265,000	845,000
TC-LC-0700-T000	Lifting Clamp Assembly, 7”	249,000	795,000

† All ratings are based on 4145 steel with a minimum 32 Rockwell C (Rc). Contact GEODynamics Engineering for other materials.



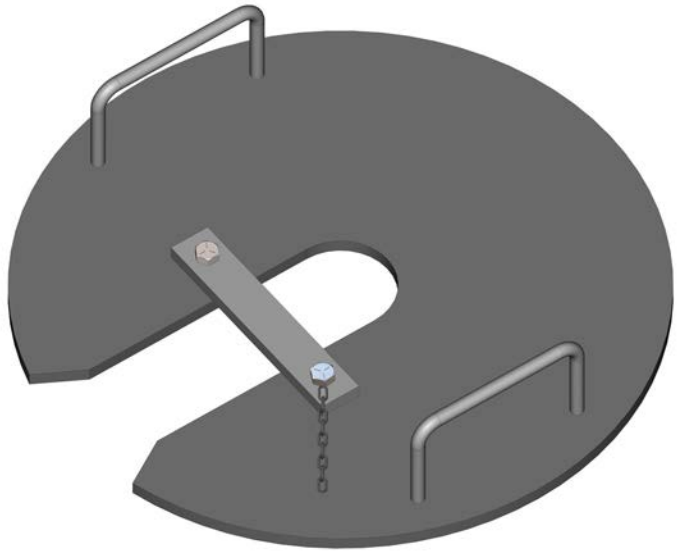
6.75” Lifting Clamp Assy
TC-LC-0675-0000 (*shown*)

Support Plates
Offshore Support Plates

Support plates hold the perforating guns in place on the rig floor. Offshore Support Plates feature a large outer diameter (22" OD) for compatibility with offshore applications.

SPECIFICATIONS

Gun O.D.	Part Number	Description	Yield Rating		Weight	
			(lbf)	*(daN)*	*(lb)*	*(kg)*
1-9/16"	TC-SP16-000	1-9/16" Support Plate	25,000	11,121	28	12.7
2"	TC-SP20-000	2" Support Plate	30,000	13,345	31	14.1
2-1/2"	TC-SP25-000	2-1/2" Support Plate	32,000	14,234	31	14.1
2-3/4" & 2-7/8"	TC-SP27-000	2-3/4" and 2-7/8" Support Plate	31,000	13,789	31	14.1
3-1/8"	TC-SP31-000	3-1/8" Support Plate	38,000	16,903	53	24.0
3-3/8"	TC-SP33-000	3-3/8" Support Plate	41,000	18,238	53	24.0
4"	TC-SP40-000	4" Support Plate	70,000	31,138	53	24.0
4-1/2"	TC-SP45-000	4-1/2" Support Plate	75,000	33,362	51	23.1
5-1/8"	TC-SP51-000	5-1/8" Support Plate	80,000	35,586	50	22.7
7"	TC-SP70-000	7" Support Plate	100,000	44,482	86	39.0



Cableheads are used to create a mechanical and electrical connection between the wireline and tool string. The cablehead is also intended to be the weak link if the tool string become stuck within the wellbore. The wireline will pull out of the cablehead when the set force is applied.

SPECIFICATIONS

Temperature Rating	500°F
Pressure Rating	20,000 psi
Diameter Range	3/4" to 1-11/16"
Tool Length	Varies
Type	"GO" Brass Cone and Washer and Clamp Ring
Fishnecks	1" O.D and 1-3/8" O.D.
Connections	Gearhart "GO"

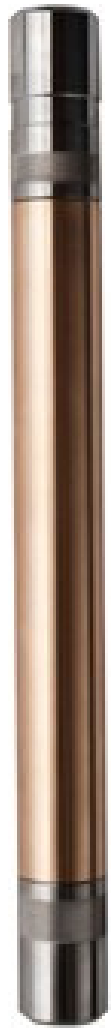
CABLEHEADS

O.D.	Part Number	Description
5/8"	AEL-CHD0001-5/16"	Cablehead, 5/8in (5/16in Line)
	AEL-CHD0001-Line Size	Cablehead, 5/8in x 1/4in-7/32in-5/16in-9/32in Line
11/16"	AEL-CHD1001-5/16"	Cablehead, 11/16in (5/16in Line)
3/4"	AEL-CHD2001-7/32"	Cablehead, 3/4, (7/32 Line)
	AEL-CHD2001-9/32"	Cablehead, 3/4, (9/32 Line)
	AEL-CHD2001-Line Size	Cablehead, 3/4in X Line Size
1"	AEL-CHD3001-5/16"	Cablehead, 1in X 5/16in
	AEL-CHD3001-7/32"	Cablehead, 1in (7/32in Line)
	AEL-CHD3001-Line Size	Cablehead 1in X Line Size
	AEL-CHD3001-9/32	Cablehead, 1in (9/32in Line)
1-3/8"	AEL-CHD4001-3/8"	Cablehead, 1-3/8in
	AEL-CHD4001-9/32"	Cablehead, 1-3/8in, GO (9/32in Line)
1-7/16"	AEL-CHD5001-1/4"	Cablehead 1-7/16in, GO (1/4in Line)
	AEL-CHD5001-3/8"	Cablehead 1-7/16in GO Style x 3/8in
	AEL-CHD5001-5/16"	Cablehead 1-7/16in GO Style x 5/16in
	AEL-CHD5001-7/32"	Cablehead 1-7/16in GO Style x 7/32in
	AEL-CHD5001-9/32"	Cablehead 1-7/16in GO Style x 9/32in

Part Number	Description
AEL-CHD-100001-5/16	Clamp Ring, 1in (5/16in Line)
AEL-CHD-100001-9/32	Clamp Ring, 1in (9/32in Line)
AEL-CHD-100002-5/16	Rope Socket, 1in (5/16in Line)
AEL-CHD-100002-9/32	Rope Socket, 1in (9/32in Line)
AEL-CHD-143006-5/16	Cablehead fishing neck, 1-7/16 (5/16in Line) Size
AEL-CHD-143006-7/32	Cablehead fishing neck, 1-7/16-7/32in Line Size
AEL-CHD-143006-9/32in	Cablehead fishing neck, 1-7/16-9/32in Line Size
AEL-CHD-143009	Cable Head Sleeve, 1-7/16in
AEL-CHD-143010-1/4	Cablehead Cone, 1/4in Line
AEL-CHD-143010-5/16	5/16in Brass Cable Head Cone 1-7/16in GO Style
AEL-CHD-143010-7/16	7/16in Brass Cable Head Cone 1-7/16in GO Style
AEL-CHD-143010-7/32	7/32in Brass Cable Head Cone 1-7/16in GO Style
AEL-CHD-143010-9/32	9/32in Brass Cable Head Cone 1-7/16in GO Style
AEL-CHD-143013	Brass Washer
AEL-CHD-143014-1/4	Cablehead 1-3/8" FISH NECK, 1-7/16" (1/4" Line)
AEL-CHD-143014-7/32	Cablehead 1-3/8" FISH NECK, 1-7/16" (7/32 Line)

Advanced E-Line Solutions
Collar Locators (CCL)

Collar locators are based on the principle that changing magnetic flux within the instruments sensor coil generates voltage across the terminals of that sensor coil. A collar or joint in the tubing changes the magnetic flux field including the flux passing through the sensor coil ends adjacent to the magnets, causing a signal to be generated at surface.



SPECIFICATIONS

Temperature Rating	500°F
Pressure Rating	20,000 psi
Diameter Range	5/8” to 3-1/8”
Tool Length	Varies
Type	Grounded (Shooting) and Non-Grounded (Free Point)
Connections	Gearhart “GO”

COLLAR LOCATORS (CCL)

O.D.	Part Number	Description
5/8”	AEL-CCL0001	CCL, 5/8in
11/16”	AEL-CCL1001	CCL, 11/16in (Non-Grounded)
3/4”	AEL-CCL2001	CCL, 3/4in
1”	AEL-CCL3001	CCL, 1in, GO Style
	AEL-CCL3002	CCL, 1in, Non-Grounded
1-3/8”	AEL-CCL4001	CCL, 1-3/8in, Grounded
	AEL-CCL4002	CCL, 1-3/8in, Non-Grounded
1-7/16”	AEL-CCL5001	CCL, 1-7/16in, GO Style
1-11/16”	AEL-CCL6002	CCL, 1-11/16in, GO Style
	AEL-CCL6003	CCL, 1-11/16in, Grounded
1-5/8”	AEL-CCL6006	CCL, 1-5/8in, (Non-Grounded)
2-1/8”	AEL-CCL-7002	CCL, 2-1/8", (Grounded)
2-3/4”	AEL-CCL8001	CCL, 2-3/4" (Grounded)
3-1/4”	AEL-CCL9001	CCL, 3-1/4in, GO Style (GO Box Top-QC Box Btm)
3-1/8”	AEL-CCL9002	CCL, 3-1/8in, GO Style (GO Box Top-QC Box Btm)
	AEL-CCL9004	CCL, 3-1/8in, with Fishneck (Grounded)
	AEL-CCL9006	CCL, 3-1/8in, with Baker Fishneck

Part Number	Description
AEL-CCL-100006	CCL Wire Contact, (1in and 3-1/4in)
AEL-CCL-143004	Lower CCL Contact
AEL-CCL-312001	CCL Housing, 3-1/8in
AEL-CCL-312007	CCL Top Sub (Atlas)
AEL-CCL-325004	CCL Magnet Sleeve, 3-1/4in
AEL-CCL-325009	CCL Diode Insulator
AEL-CCL-325010	CCL Lower Insulator
AEL-CCL-325011	CCL Shock Rubber
AEL-CCL-325013	Fishneck Top Sub for 3-1/8in CCL
AEL-CCL-325015	CCL Contact
AEL-CCL-325COIL	CCL Wound Coil, 3-1/4'

CCL KITS

AEL-KIT-CCL4002	Kit, CCL, 1-3/8in (non-grounded)
AEL-KIT-CCL5001	CCL Insert, 1-7/16in Grounded
AEL-KIT-CCL6002	Kit, CCL, 1-11/16in Grounded (short)
AEL-KIT-CCL6005-R1	Kit CCL Top Sub, 1-11/16in (short)
AEL-KIT-CCL7001	Kit, CCL, 2" and 2 1/8", GROUNDED
AEL-KIT-CCL9001	Kit, CCL, 3-1/4in, Grounded

Advanced E-Line Solutions
Sinker Bars

Sinker bars, sometimes referred to as “weight bars”, are designed to run above your tool string to overcome forces created by well pressure within the wellbore. Sinker bars are available in various diameters and lengths and are supplied with industry-standard box/pin connections.

SPECIFICATIONS

Temperature Rating	500°F
Pressure Rating	20,000 psi
Diameter Range	5/8” to 2-3/4”
Tool Length	3’, 5’, and 7’
Type	Steel, Lead, and Tungsten
Connections	Gearhart “GO”, Sucker Rod, and Quick Change “GO”

SINKER BARS

O.D.	Part Number	Description
5/8”	AEL-SBS0002	Sinker Bar, Steel 5/8in x 3'
3/4”	AEL-SBS2001	Sinker Bar, Steel 3/4in x 5'
1”	AEL-SBS3001	Sinker Bar, Steel 1in x 5'
	AEL-SBS-3003	Sinker Bar Steel 1in x 3'
	AEL-SBS3002	Sinker Bar Steel, 1in x 7'
	AEL-SBT3001	Sinker Bar, Tungsten, 1in x 5'
1-3/8”	AEL-SBS4002	Sinker Bar, 1-3/8in x 7'
1-7/16”	AEL-SBL5001	Sinker Bar, Lead 1-7/16in x 5'
	AEL-SBL5002	Sinker Bar, Lead 1-7/16in x 7'
	AEL-SBS5001	Sinker Bar, Steel 1-7/16in x 5'
	AEL-SBS5002	Sinker Bar, Steel 1-7/16in x 7'
	AEL-SBT5002	Sinker Bar, Tungsten, 1-7/16in x 7'
1-1/2”	AEL-SBS5003	Sinker Bar, Steel 1-1/2in x 5' with 5/8in Sucker Rod
1-11/16”	AEL-SBL6001	Sinker Bar, Lead 1-11/16in x 5'
	AEL-SBL6002	Sinker Bar, Lead 1-11/16in x 7'
	AEL-SBS6001	Sinker Bar, Steel 1-11/16in x 5'
	AEL-SBS6002	Sinker Bar, Steel 1-11/16in x 7'
	AEL-SBT6002	Sinker Bar, Tungsten, 1-11/16in x 7'
2”	AEL-SBL9001	Sinker Bar, Lead 2in x 5'
	AEL-SBL9002	Sinker Bar, Lead 2in x 7'
2-3/4”	AEL-SBS9003	Sinker Bar, Steel, 2-3/4in x 7', OTL
	AEL-SBT9004	Sinker Bar, Tungsten, 2-3/4in x 7' (Over the line FN THDS), Wt. 280 Lbs

Part Number	Description
AEL-SBS-168002	Contact Rod, 10-32 x 57.500"
AEL-SBS-168002-7	Contact Rod, 10-32 x 81.500"

SINKER BAR KITS

AEL-KIT-SBS6001	Kit, Sinker Bar (Universal 5' Rod)
AEL-KIT-SBS6001-LR	Kit Sinker Bar - Less Rod (fits all bars)
AEL-KIT-SBS6002	Kit, Sinker Bar (universal 7' rod)
AEL-KIT-SBS6002-LR	Kit Sinker Bar - Less Rod (Universal)

Please contact your sales representative for additional sizes and connections.

Advanced E-Line Solutions
Adaptors

Adaptors are used for various applications in the field. The most common applications are to:

- Adapt to different types and sizes of connections.
- Connect perforating tools to the rest of the tool string.

SPECIFICATIONS

Temperature Rating	500°F
Pressure Rating	20,000 psi
Diameter Range	5/8” to 3-1/8”
Tool Length	Varies
Type	Crossover Subs, Teardrops, Firing Heads, Quick Changes
Connections	Gearhart “GO”, Schlumberger, Baker Sucker Rod, and Quick Change “GO”

ADAPTORS

Part Number	Description
AEL-ADA-150005	Insulator, Button
AEL-ADA-275009	Detonator Block, 2-3/4” Safe Fire
AEL-ADA-312001	Quick Change Bell
AEL-ADA-325003	Detonator Block for GO Style Quick Change
AEL-ADA-325014	3-1/4in CCL Top Sub for 2in Fishing Neck
AEL-ADA-325015	Bull Plug (for QC Box)
AEL-ADA-325021	Detonator Block, Safe Fire
AEL-ADA0001	Tear Drop 5/8in OD
AEL-ADA0002	Shot Rod Hanger
AEL-ADA0003	Shot Rod Bull Plug, 5/8in
AEL-ADA0007	5/8in Pin x 1in GO Box
AEL-ADA0010	5/8in Double Pin
AEL-ADA10001	Baker #20 QC/Baker IGN
AEL-ADA10002	Baker #10 / GO Quick Change
AEL-ADA10003	Baker #10 / GO Quick Change (Halb. Ign.)
AEL-ADA10004	Baker #20 / GO Quick Change
AEL-ADA10005	Baker #20 / GO Quick Change (Halb. Ign.)
AEL-ADA10006	Baker #20 / GO Quick Change (with contacts)
AEL-ADA10007	Baker #10 / GO Quick Change (with contacts)
AEL-ADA2002	Tear Drop, 3/4in
AEL-ADA2003	3/4in Shot Rod Hanger
AEL-ADA2004	3/4in Double GO Box
AEL-ADA2013	Shot Rod Bull Plug, 3/4in

Adaptors list continues on next page

ADAPTOR KITS

Part Number	Description
AEL-KIT-ADA0001	Kit 5/8in Tear Drop Sub
AEL-KIT-ADA0010	Kit 5/8in Double Pin Sub
AEL-KIT-ADA10001	Kit, Baker #20 QC/Baker IGN
AEL-KIT-ADA10002	Kit, Quick Change for Baker #10/Baker IGN
AEL-KIT-ADA3005	Kit, Button Sub, 1in
AEL-KIT-ADA4001	Kit GO Tear Drop Sub 1-7/16in
AEL-KIT-ADA4001S	Kit GO Tear Drop Sub 1-7/16in (short)
AEL-KIT-ADA4003S	Kit Double GO Pin 1-7/16in
AEL-KIT-ADA4018S	Kit Tear Drop Double Sealed 1-7/16in
AEL-KIT-ADA5003S	Tear Drop, 1-7/16in (short)
AEL-KIT-ADA5004-HV	Kit Tear Drop 1-7/16in (high voltage)
AEL-KIT-ADA5005S	Kit, GO Double Pin, 1-7/16in
AEL-KIT-ADA5006	Kit, Double GO Box
AEL-KIT-ADA5007S	Kit, Tear Drop Double Sealed 1-7/16in
AEL-KIT-ADA6003	Kit 1-11/16in CCL Top Sub Kit
AEL-KIT-ADA6004	Kit 1-11/16in CCL Top Sub Kit
AEL-KIT-ADA6005	Kit 1-11/16in CCL Top Sub Kit
AEL-KIT-ADA8001	Kit Button Sub 1-1/2in (with button)
AEL-KIT-ADA8001-LR	Kit - Button Sub, 1-1/2in LP - Less Rod
AEL-KIT-ADA8004	Kit Button Sub 1-1/2in (high pressure with button)
AEL-KIT-ADA8004-LR	Kit Button Sub, 1-1/2in High Pressure - Less Rod
AEL-KIT-ADA9001	Kit, Quick Change GO, 3-1/4in
AEL-KIT-ADA9001-LR	Kit Quick Change GO 3-1/4in (less rod)
AEL-KIT-ADA9010	Kit, Quick Change, 2-3/4in

Revised: August 20, 2025 12:34 PM

ADAPTORS, cont.

Part Number	Description
AEL-ADA3001	1in GO Tear Drop
AEL-ADA3002	Shot Rod Hanger, 1in
AEL-ADA3003	1in Double GO Pin
AEL-ADA3004	FPT Bull Plug, 1in
AEL-ADA3005	Button Sub,1in
AEL-ADA3006	1in Double GO Box
AEL-ADA3011	Shot Rod Bull Plug, 1in
AEL-ADA3016	Box, 1in / Pin, 3/4in
AEL-ADA3017	Pin, 1in / Pin, 3/4in
AEL-ADA3021	Shot Rod Assembly, 1in x 5'
AEL-ADA3024	Double Sealed Tear Drop, 1in
AEL-ADA4001	Tear Drop x GO Pin, 1-3/8in
AEL-ADA4002	Shot Rod Hanger 1-3/8in
AEL-ADA4003S	Double Pin, 1-3/8in
AEL-ADA4005	Bull Plug Box, 1-3/8in
AEL-ADA4006	Bull Plug Pin, 1-3/8in
AEL-ADA4007	1-3/8in Schlumberger Box GO Pin
AEL-ADA4011	Freepoint Bull Plug, 1-3/8in
AEL-ADA4015	SR Pin, 5/8in X GO Box, 1-3/8in
AEL-ADA4016	SR Box 5/8in X GO Pin, 1-3/8in
AEL-ADA4037	Shot Rod Assembly Complete
AEL-ADA4038	Sucker Rod Box 3/4in - GO Pin, 1-3/8in
AEL-ADA4039	SR Pin, 3/4in / GO Box, 1-3/8in
AEL-ADA4041	Shot Rod Bull Plug, 1-3/8in
AEL-ADA4042	GO Box, 1-3/8in x GO Pin, 1in
AEL-ADA4043	GO Box, 1in x GO Pin, 1-3/8in
AEL-ADA5001	GO Box 1in / 1-7/16in GO Pin
AEL-ADA5002	GO Pin 1in / 1-7/16in GO Box
AEL-ADA5003	Tear Drop / GO Pin 1-7/16in, Long
AEL-ADA5003S	Tear Drop / GO Pin 1-7/16in, Short
AEL-ADA5004-HV	Tear Drop / GO Pin 1-7/16in High Voltage Contact
AEL-ADA5005	Double GO Pin 1-7/16in
AEL-ADA5005S	Double GO Pin 1-7/16in Short
AEL-ADA5006	Double GO Box 1-7/16in
AEL-ADA5007	Sealed Tear Drop / GO Pin 1-7/16in
AEL-ADA5007S	Double Sealed Tear Drop / GO Pin 1-7/16in (short)

Part Number	Description
AEL-ADA5008	GO Box / Tear Drop Pin 1-7/16in
AEL-ADA5009	GO Pin / Sealed Tear Drop 1-7/16in
AEL-ADA5010	Double GO Pin 1-7/16in (with phasing ring)
AEL-ADA5011	GO Tear Drop Sub 1-7/16in (with phasing ring)
AEL-ADA5012	GO Sealed Tear Drop / GO Box 1-7/16in
AEL-ADA6001	Schlumberger Box 1-11/16in / GO Pin
AEL-ADA6002	1-11/16" Double Sealed Tear Drop, Go Pin
AEL-ADA6003	Schlumberger Pin 1-11/16in / GO Pin
AEL-ADA6006S	Teardrop Pin / GO Pin, 1-11/16in
AEL-ADA6007	RTG Tandem 1-9/16in
AEL-ADA6008	RTG Top Sub 1-9/16in
AEL-ADA6009	RTG Blast Sub 1-9/16in
AEL-ADA6010	RTG Bull Plug 1-9/16in
AEL-ADA6011	RTG Lower De-centralizer Adapter 1-9/16in
AEL-ADA6013	GO Box Double, 1-11/16in
AEL-ADA6015	GO Pin Double, 1-11/16in
AEL-ADA6024	Shot Rod Assembly, 1-5/8in x 5'
AEL-ADA6030	Shot Rod Hanger, 1-5/8in
AEL-ADA6100	Tag Shooting Sub, 1-11/16in
AEL-ADA7004	QC Pin GO 3-1/4in, GO Pin 1-7/16in
AEL-ADA7010	QC Box / GO Box, 2-1/2in
AEL-ADA8001	Button Firing Sub 1-1/2in
AEL-ADA8004	Button Firing Sub 1-1/2in (high pressure)
AEL-ADA8019-DB	Adapter, Quick Change, 2-3/4" (GO Box) Safe Fire
AEL-ADA8020	Adapter, Quick Change, 2 3/4"
AEL-ADA8022-DB	Adapter, Quick Change, Det Block, 2 3/4
AEL-ADA9001	Quick Change GO Style 3-1/4in OD Less Det Block
AEL-ADA9001-DB	Quick Change GO Style 3-1/4in or 3-1/8in OD With Det Block
AEL-ADA9004	Quick Change GO Style 3-1/8in OD Less Det Block
AEL-ADA9004-DB	Quick Change GO, 3-1/8in (with detonator block)
AEL-ADA9007	Top Sub, 2-3/4in (Over the line, 2/3/8in FN)
AEL-ADA9007-2	Top Sub, 2-3/4in (Over the line, 2in FN)
AEL-ADA9008	2in Fishing Neck for 3-1/8in or 3-1/4in CCL
AEL-ADA9009	Fish Neck Pin/Box, 2-3/4in
AEL-ADA9019-DB	Adapter, Quick Change, GO (Safe Fire) 3-1/8

Advanced E-Line Solutions
Centralizers and De-Centralizers

Centralizers are used within the tool string to keep the tools centralized within the tubing. They are manufactured with either bow springs or roller arms. Centralizers with roller arms are used in deviated wells to help guide the tool string down hole without any hang-ups.

De-centralizers are used within the tool string to keep the tools de-centralized against casing wall. They usually run in conjunction with perforating guns (orient the guns to a specific side of the casing) or with neutron logging (to keep the radioactive source against the casing wall).

SPECIFICATIONS

	CENTRALIZERS	DE-CENTRALIZERS
Temperature Rating	500°F	500°F
Pressure Rating	20,000 psi	20,000 psi
Diameter Range	1-7/16” to 2-3/4”	1-3/8” to 2”
I.D. Range	1-5/8” to 22”	N/A
Tool Length	Varies	Varies
Type	Bowspring and Roller Arm	Channel or Button Magnets
Connections	Gearhart “GO” and Quick Change “GO”	Gearhart “GO” and RTG (bolt-together type)

CENTRALIZERS

Part Number	Description
AEL-CEN5002-6	1 7/16in Centralizer, 3 Blades w/ 6in Springs
AEL-CEN6001-6	1-11/16in Centralizer, 6in Springs
AEL-CEN9001	2-3/4" Centralizer (Spring Type)

CENTRALIZER KITS

AEL-KIT-CEN6001	Kit, CCL, 1-11/16in Grounded (short)

DE-CENTRALIZERS

Part Number	Description
AEL-DEC4001	Decentralizer 1-3/8in GO Pin Phase RNG (Channel Magnet)
AEL-DEC6001	Decentralizer 1-11/16in GO Pin Phase RNG (Channel Magnet)
AEL-DEC6002	Decentralizer 1-9/16in RTG (Channel Magnet)
AEL-DEC6003	Decentralizer 1-11/16in RTG (Channel Magnet)
AEL-DEC6004	Decentralizer 1-9/16in GO (Channel Magnet)
AEL-DEC9001	Decentralizer 2-1/8in GO (Channel Magnet)
AEL-DEC9002	Decentralizer 2in RTG (Channel Magnet)
AEL-MAG-100-003	Channel Magnet for 1-916” Decentralizer

DE-CENTRALIZER KITS

AEL-KIT-DEC6001	Kit, Decentralizer, 1-11/16in

Revised: August 20, 2025 12:34 PM

Advanced E-Line Solutions
Freepoint Tools

Freepoint tools are designed to measure torque and stretch in tubing, casings, and drill pipes to provide accurate free pipe indication. The Advanced Freepoint tool works in conjunction with the Warrior Logging System. The freepoint tool string consists of the following:

- Slack Joint (16", 24", or 36" stroke)
- Top Anchor (Magnet or Bowstring) Sensor
- Bottom Anchor (Magnet or Bowstring)

SPECIFICATIONS

Temperature Rating	500°F
Pressure Rating	20,000 psi
Diameter Range	1" to 1-3/8" O.D.
Tool Length	Varies
Anchor Type	Magnets or Bowspring
Sensor Type	Piston or Boot
Slack Joint Stroke	6" (24" and 36" available on 1-3/8" OD tool)
Connections	Gearhart "GO"

FREEPOINT TOOLS

Part Number	Description
AEL-FBS1001	FPT Upper Bowspring, 11/16in
AEL-FBS1002	FPT Lower Bowspring, 11/16in
AEL-FBS3001	FPT Bowspring, 1in
AEL-FBS-137029	Bottom Insulator (Applied Style)
AEL-FMG1001	Magnet, Upper Section 11/16in
AEL-FMG1002	Magnet, Spacer Section, 11/16in
AEL-FMG1003	Magnet, Lower Section, 11/16in
AEL-FMG3001	Magnet, Upper Section, 1in
AEL-FMG3002	Magnet, Spacer Section1in
AEL-FMG3003	Magnet, Lower Section 1in
AEL-FMG4001	Magnet FPT Upper 1-3/8in
AEL-FMG4002	Magnet, FPT Spacer, 1-3/8in
AEL-FMG4003	Magnet FPT Lower 1-3/8in
AEL-FMG6001	FPT Upper Magnet, 1-5/8in
AEL-FMG6002	FPT Magnet Spacer, 1-5/8in
AEL-FMG6003	FPT Lower Magnet, 1-5/8in
AEL-FPT1000	11/16in Freepoint Tool Complete
AEL-FPT3000	1in Freepoint Tool Complete

Part Number	Description
AEL-FPT3001	Freepoint Tool, 1in W/Magnets
AEL-FPT4000	1-3/8in Freepoint Tool Complete
AEL-FPT6000	1-5/8in Freepoint Tool Complete
AEL-FSJ1001	FPT Slack Joint, 11/16in
AEL-FSJ3001	Slack Joint, 1in
AEL-FSJ4001	Slackjoint, 1-3/8in x 16in
AEL-FSJ6001	Slack Joint, 1-5/8in x 16in
AEL-FSJ-162006	Slackjoint Key, 1-5/8in and 1-3/8in
AEL-FSJ-WIRE-12	Slack Joint Spring Wire, 11/16in
AEL-FSJ-WIRE-13	Slack Joint Spring Wire, 1in
AEL-FSJ-WIRE-16	Slack Joint Spring Wire, 1-3/8in - 1-5/8in x 16in
AEL-FSA0006	Rubber Boot, 1 3/8in and 1 5/8in
AEL-FSN1001	FPT Sensor, 11/16in
AEL-FSN3001	FPT Sensor, 1in
AEL-FSN6001	FPT Sensor, 1-5/8in
AEL-FSN-137005	Sensor Boot End Sub, 1 3/8in
AEL-FSN-137006	Sensor Boot End Cap 1 3/8in
AEL-FSN-162009	Sensor Adjustment Collar, 1 5/8in
AEL-FSN-162010	Sensor Jam Nut, 1 5/8in
AEL-FSN6002-SIE	SIE Sensor Top Sub, Crossover

Revised: August 20, 2025 12:34 PM

ADDITIONAL PARTS AND ACCESSORIES

Part Number	Description
AEL-CMP-100001	Clamp Pliers, 5/16in and 7/32in
AEL-CMP-100002	Clamp Block, 9/32in and 7/32in
AEL-CON-100033	Plunger, GO Pin
AEL-CON-100035	Contact Plunger, Brass
AEL-CON-100081	Contact, 10-32 THD
AEL-CON100037HV	Spring contact, 2in (Hi Amp)
AEL-CR1015	Contact Rod, 10-32 x 32.125in
AEL-CR1016	Contact Rod, 8-32 x 48.875in
AEL-DIO001	Double Diode Cart for CCLS
AEL-GNK-143001	GOOSE NECK, 1 7/16"
AEL-INS-075005	Insulator Beveled, 3/4in
AEL-INS-100005	Insulator, Tube
AEL-INS-100041	Insulator Cover
AEL-INS-100042	Spring Tube Insulator
AEL-INS-100042-Rev2	Spring Combo Insulator
AEL-INS-100042-Rev3	Spring Combo Insulator
AEL-INS-150004	Rubber Washer, Button
AEL-INS-150005	Insulator Button
AEL-INS-325004	Insulator, Spring QC
AEL-INS-325005	Insulator Plunger, QC
AEL-INS-325007	Insulator, Rod QC
AEL-INS-325008	Insulator Button, QC
AEL-INS-325008-REV1	Insulator Button, QC, Virgin Peek
AEL-KEM-000002	Pressure Connector, 1032 THD (16-B-00360)
AEL-KIT-SHK6001	KIT - SHOCK ABSORBER SUB, 1 11/16"
AEL-KNU5001	Knuckle Joint 1-7/16in GO Connections
AEL-KNU9001	Knuckle Joint Fish Neck Pin/Box, 2-3/4in
AEL-ORG012-90	O-Ring, Size 012, Viton, 90
AEL-ORG115-90	O-Ring, Size 115, Viton, 90
AEL-ORG211	O-Ring, Size 211, Viton, 90
AEL-ORG229	O-Ring, Size 229, Viton, 90
AEL-PAN001	Panel, Freepoint (11/16in - 1-3/8in) / CCL
AEL-PAN002	Dual Free Point / CCL
AEL-PAN004	Panel, Rack Mount Dual FPT / CCL

Part Number	Description
AEL-PUR048	Button Head Socket Screw, 10-32 x 3/16in
AEL-PUR058	Button Head Socket Screw, 10-32 x 3/16in
AEL-PUR080	Socket Set, 5/16-24 x 1/4
AEL-PUR095	Pan Head Screw, 10-32 x 2"
AEL-PUR253	Retainer Ring (Internal), .750
AEL-PUR314	Button Head Socket Screw, 6-32 x 1/4in
AEL-PUR322	Socket Set Screw, 1/4-28 x 1/4in
AEL-PUR349	Bearing, Roller
AEL-PUR351	Thrust Bearing, 1 1/4in
AEL-PUR432-HT	CABLEHEAD BOOT, 1/8" (HIGH TEMP)
AEL-SHK6001	SHOCK ABSORBER SUB, 1 11/16"
AEL-SKA5003	Wireline Skate 1.8125 Drift 1-9/16in
AEL-SPG-000001	Spring, 14.125in Carbide
AEL-SPG-000002	Spring, 14.125in Slick
AEL-SPG-000007-13	Bowspring Centralizer, 13in
AEL-SPG-000007-4	Bowspring Centralizer, 6in
AEL-SPG-000007-6	Bowspring Centralizer, 6in
AEL-SPG-000007-9	Bowspring Centralizer, 9in
AEL-SPG-000011	Spring, Carbide, 16in
AEL-SPG-000016	Casing Bow Spring Carbide (18.5 SIE)
AEL-SRD-062008	Shot Rod, 1/4in x 5'
AEL-SRD-062008-7	Shot Rod, 1/4in x 7'
AEL-SRD-1000001	Shot Rod Double Box Extender
AEL-SRD-100012	Shot Rod Coupler, w/Set Screw
AEL-SRD-100131	Shot Rods 3/8in x 5'
AEL-SRD-100131-5	Shot Rod, 3/8in x 5'
AEL-SRD-100131-7	Shot Rod, 3/8in x 7in
AEL-TEF0001	Teflon Tubing #4
AEL-TEF0002	Teflon Tubing
AEL-TEF0011	#6 Standard Wall Teflon Tubing
AEL-THD-137002	Thread Protector, 1 3/16-12 Pin
AEL-TPE-00001	Teflon Tape Clear 3/4in x 36 yards - Hi Temp
AEL-TPE002	Tape, Teflon, 3/4in x 36, Gray, 224-2HD
AEL-TPE003	Tape, Glass, 1/2in Wide, DW 469
AEL-WAX-STRING	Wax Lacing Cord

Part Number Descriptions
Loaded Gun Assemblies, HELLFire®, GLB Short Guns

GEODynamics®

Examples: Loaded Gun Part Numbers and Descriptions	
LGHF33HF06-03I0771-XX-XXX	HELLFire® Loaded, 3.38" x 9.5", 06 Shots, 120/60° (HF), DET-80R111, EC2-33K0771, 03 Loaded, 3 Blank, No Sub, No Switch, No O-Rings

Gun Assembly		Gun Series	Carrier OD	Phasing	# Shots	–	# Loaded Shots	Detonating Cord	Charge P/N *(w/out EC2-33X prefix)*	–	Charge P/N *(suffix)*	–	Sub	Switch	O-Ring Material
LG	Loaded Gun	**XX**	**NN**	**XX**	**NN**	–	**NN**	**X**	**NNNN**	–	**XX** thru **XXXXX**	–	**X**	**X**	**X**

Gun Series		
LB	GLB	Short Guns
HF	HF	HELLFire®

Carrier OD
Two-Digit OD (e.g., **31**)

Phasing	
A	60°
B	90°
C	135°-45°
D	140°-20°
G	120°
J	180°
O	0°
P	72°
V	51.4°
R	Rotated
HF	120°/60°
SA	45° T, 60°
SB	45° T, 90°
SC	45° T, 135°
SD	45° T, 140°
SG	45° T, 120°
SJ	45° T, 180°
SO	45° T, 0°
SP	45° T, 72°
A0	60°
O0	0°
J0	180°
G0	120°
B0	90°
R0	Rotated
P0	51.4°

Shots
Total shots available in the carrier (e.g., 06, 12)

#Loaded Shots
Actual number of loaded shots (e.g., carrier holds 06, but 05 loaded per order)

Detonating Cord	
X	No Detcord
F	DET-80H212 (HMX)
I	DET-80R111 (RDX)

Charge P/N
The 4-digit charge part number followed by -XX or a 2- to 5-character suffix; e.g., EC2-33A1371 = **1371-XX** EC2-33A2371-BF45 = **2371-BF45**

Sub	
X	No Sub
C	Disposable XVR T172A

Switch	
X	No Switch
A	EL1-AL-1000
C	ASW-130

O-Ring Material	
X	No O-Rings (No Sub)
N	Nitrile
V	Viton

Examples: Conventional Long Gun Part Numbers and Descriptions	
GA3106-6033A-A084	Carrier Assembly, 3.13" x 15', 84 Shots, 60° (6 spf)
GA3106-6033A-A120	Carrier Assembly, 3.13" x 21', 120 Shots, 60° (6 spf)
GA4612-4054A-C253	Carrier Assembly, 4.63" x 22', 253 Shots, 135/45°, Phased, (12 spf)

Gun Assembly Type		Carrier OD	SPF / SPM	–	Coded Load Tube Size	Charge Family P/N Code	–	Phasing	Total # of Shots
GA	Gun Assembly - Standard	NN	NN	–	NN	NNX	–	X	NNN
GM	Gun Assembly - Metric								

Carrier OD	
Size	Code
1-9/16"	**16**
1-3/4"	**175**
2"	**20**
2-3/8"	**23**
2-1/2"	**25**
2-3/4"	**27**
2-7/8"	**28**
3-1/8"	**31**
3-3/8"	**33**
4"	**40**
4-1/2"	**45**
4-5/8	**46**
4-3/4"	**47**
5"	**50**
5-1/8"	**51**
6-3/4"	**67**
7"	**70**

Charge Family	
Size	Code
1-9/16"	**15A**
1-3/4"	**17A**
2"	**20A, 20B**
2-3/8"	**23A**
2-1/2"	**25A**
2-3/4"	**27A**
2-7/8"	**27A, 28A**
3-1/8"	**31B, 33A**
3-3/8"	**33A, 33B, 33Z**
4"	**40A, 40B, 40S**
4-1/2"	**45A, 45B, 45C**
4-5/8"	**46A, 46B**
4-3/4"	**48K**
5-1/8"	**51A, 51B, 51C**
6-5/8"	**66S**
6-3/4"	**68K**
7"	**70A, 70B, 70C, 70D, 70K**

Phasing	
Code	Phase
A	60°
B	90°
C	135° - 45°
D	140° - 20°
G	120°
J	180°
O	0°
P	72°
R	90° + 45° 60° + 30° 51.4° + 25.7°

Part Number Descriptions
Shaped Charges

Examples: Shaped Charge Part Numbers and Descriptions	
EC2-33A2341	33A Charge Case (carrier OD 3.13/3.38", or larger carrier with 33A load tube), 23 grams, RDX
EC2-33A2322	33A Charge Case (carrier OD 3.13/3.38", or larger carrier with 33A load tube), 23 grams, HMX
EC2-40A3922-RC	40A Charge Case (carrier OD 4.0", or larger carrier with 40A load tube), 39 grams, HMX, Reactive Charge

Explosive Charge	Gun Type		–	Carrier OD	Case Type	Explosive Weight	Charge Type	Explosive Type	–	Suffix
	Code	Description								
EC	1	Retrievable Tubing Gun	–	NN	X or XX	NN *(g)*	N	N	–	XX thru XXXXX
	2	Retrievable Casing Gun								

Carrier OD	
Size	Code
1-9/16"	15
1-3/4"	17
2"	20
2-3/8"	23
2-1/2"	25
2-3/4"	27
2-7/8"	28
3-1/8"	31, 33
3-3/8"	33
4"	40
4-1/2"	45
4-5/8"	46
4-3/4"	48
5-1/8"	51
6-5/8"	66
6-3/4"	68
7"	70

Case Type

Represents charge case properties, such as material, case size, case shape, or shot arrangement (in the gun carrier). Used internally.

Charge Type

Represents the type of charge. Some examples are: DP, XDP, BH, SBH, GH, and Equal Hole size charges.

Explosive Type	
1	RDX
2	HMX
3	HNS

Charge P/N Suffix

Extra characters, e.g., EC2-33A2371-**BF45** is (Basix Frac, 0.45" entry hole). See list below.

Charge P/N Suffixes	
-BF	Basix™ Frac
-C	IsoLoc™ Charges
-D	Refrax™ Dual Casing
-E	Economy
-EG	Economy Grooved
-FRX	FracIQ® Connex®
-G	Grooved Case
-LD	Low Debris
-L, -LS	Low Swell
-R	Refrax™ Dual Casing
-RC	Connex® Reactive Charge
-RX	Reactive Charge
-SB	SandIQ®
-SC	SandIQ®
-SD	SandIQ®
-SE	SandIQ®
-SF	SandIQ®
-SG	SandIQ®
See Nomenclature for more details	

Revised: August 20, 2025 12:34 PM

	A - B - C
API	American Petroleum Institute
BH	Big Hole
BRT	Ballistic Release Tool
CCL	Casing Collar Locator
	D - E - F
DP	Deep Penetrating
DUB	Dynamic Underbalance
EH	Entry Hole
EHD	Entry Hole Diameter
EUE	External Upset End (tubing connection)
FLUID	Fluid Only
FLUID or DRY	Fluid or Dry Gas
	G - H - I
GH	Good Hole
HD	Heavy Duty
HF	HELLFire®
HMX	Cyclotetramethylene Trinitramine
HNS	Hexanitrosilbene
HP	High Pressure
HPHF	High Pressure, High Flow
ID	Internal Diameter
ISO	Internal Organization for Standardization
ITPO	Independent Third-Party Organization
	J - K - L
LEH	Limited Entry Hole
LH	Left Hand (e.g., left-hand threads)
	M - N - O
NPT	Non-Productive Time
OD	Outer Diameter
	P - Q - R
PSA	Plug/Shoot Adapter
QC	Quick Change
RDX	Cyclotrimethylene Trinitramine
RF Safe	Radio Frequency Safe
RH	Right Hand (e.g., right-hand threads)
RTG	Retrievable Tubing Gun
	S
SPF	Shots Per Foot
SPM	Shots Per Meter
SQC	Short Quick Change
STD	Standard
	T - U
TCP	Tubing-Conveyed Perforating
THD	Thread
	V - W - X
WL	Wireline
WRT	Wireline Release Tool
	Y - Z
ZTC	Zero Tension Connector

SHAPED CHARGE ABBREVIATIONS & PART NUMBER SUFFIXES

-45	All two-digit numerical suffixes represent the entry hole diameter (EHD), e.g., BF45 is Basix Frac with 0.45" EHD.
-B	IsoLoc™ Charge
-BF	Basix™ Frac
BH	Big Hole
-C, -C1, -C3, -C4	IsoLoc™ Charges (various liner materials and performance)
CEH	Constant Entry Hole
-D	Refrax™ Dual Casing
-DP	Deep Penetrating
-E	Economy
-EG	Economy Grooved Case
-FRX	FracIQ® Connex®
-G	Grooved Case
GH	Good Hole
-L, -LS	Low Swell
-LD	Low Debris
-LEH	Limited Entry Hole
-R	Refrax™ Dual Casing
-RC	Connex® Reactive Charge
-RX	Reactive Charge other than Connex® (can be FracIQ® and other special charges with reactive liner material)
-SB, -SC, -SD, -SE, -SF, -SG	SandIQ®
SBH	Super Big Hole
SDP	Super Deep Penetrating
SGH	Super Good Hole
-T	IsoLoc™ Charge
TL	Twistlock
XDP	Extra Deep Penetrating
-XEH	Extra Entry Hole
XLS	Extra Low Swell

This page intentionally left blank

NOTES

GEODynamics®

CORPORATE HEADQUARTERS

10400 West Interstate 20

Millsap, TX 76066

Office: +1.817.341.5300

Toll Free: +1.855.737.3397 (1-855-PERF-EXP)

Website: www.perf.com

Contact Us: www.perf.com/learn-more