

## Featuring PowerPivot Charges

### Description

The Pivot Gun\* systems are wireline through-tubing guns with excellent performance and are ideal for workover reperforating or shooting past deep formation damage. Gun diameter running-in-hole is only 1<sup>11</sup>/<sub>16</sub> in., but once below the tubing, charges are rotated outward giving a

gun with an effective diameter of 3.79 in. Penetration is nearly 33 in. with the PowerPivot\* charge. Carrier and charges break up after detonation. Casing Collar Locator and deployment head are retrieved.

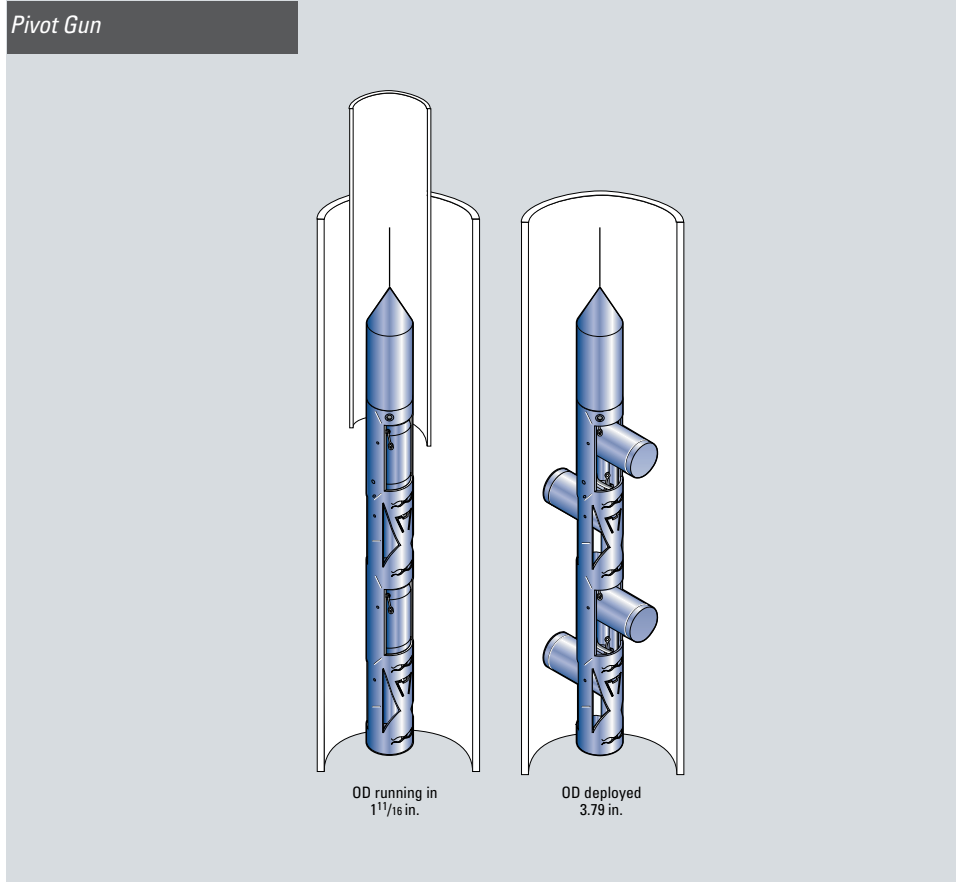
An important feature of the gun is the Safe Arming/Deployment Verification Circuit. This prevents the

gun from being armed and fired until the charges are fully rotated outward from the gun carrier by the deployment head and rods.

Another key feature is that an unfired but deployed gun can still be retrieved. The charges will rotate back into the carrier as the gun enters the tubing mule shoe.

### Ratings and Physical Data

Nominal outside diameter (in.)	Running in	1 <sup>11</sup> / <sub>16</sub>
	Deployed	3.786
Shots per foot, phasing (°)		4, 180
Maximum length (ft)		15
Maximum temperature (°F)		365
Maximum pressure (psi)		12,000 @ 365°F
Minimum restriction (in.)	Running in	1.78
Minimum casing size (in.)	Deployed	4 <sup>1</sup> / <sub>2</sub> - 11.6 lb/ft
Minimum tensile strength (lbf)		2000
Debris fill in 5 <sup>1</sup> / <sub>2</sub> -in. casing (in./ft)		1.9



Mechanical Data							
Nominal outside diameter (in.)	Charge	Shots per foot, phasing (°)	Maximum gun length (ft)	Maximum pressure (psi)	Temperature † RDX/HMX/HTX (°F)	Minimum restriction ‡ (in.)	Debris fill § (in.)
1 <sup>11</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub> in. Ultracap	4, 180	15	12,000	330/365/n.a.	1.78	0.85/0.48/0.33
† Temperature ratings are for 1 hour.							
‡ Minimum restriction for running in. The deployed guns have an OD of 3.79 in.							
§ Fill per charge in 4 <sup>11</sup> / <sub>16</sub> -in., 5 <sup>1</sup> / <sub>2</sub> -in. and 7-in. casing.							

API Statistics								
Charge	Explosive maximum weight (g)	Shots per foot, phasing (°)	Entrance † hole	Area open to flow (in. <sup>2</sup> /ft)	Penetration † (in.)	Temperature (°F)	Target strength (psi)	Test date
1 <sup>11</sup> / <sub>16</sub> -in. Ultracap	RDX, 21.4	4, 180	0.38	0.45	27.8	330	5504	09-94
1 <sup>11</sup> / <sub>16</sub> -in. PowerPivot	HMX, 22.0	4, 180	0.32	0.36	32.8	365	6935	03-98
† API RP43 shot in 4 <sup>1</sup> / <sub>2</sub> -in., 11.6 lb, L-80 casing								