HYDRIL "CS" TUBING JOINT

(Patented)

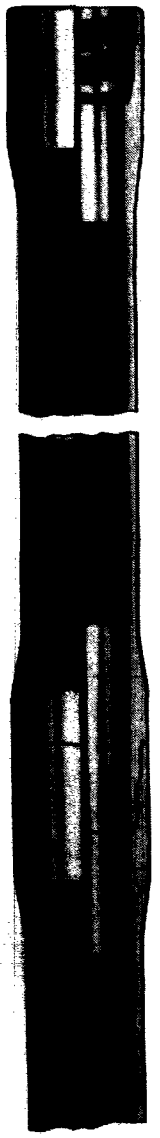

Fig. 59 Hydril "CS" Tubing Joint.

The Hydril "CS" tubing joint was first introduced to the industry in 1947. Since then this joint has proved its merits so conspicuously that most oil and gas producers now prefer Hydril "CS" tubing strings wherever the producing conditions require better tubing. Hydril "CS" tubing strings are now in use in most of the high-pressure producing fields of the country.

This tubing joint is as strong as is needed in the deepest of wells. High pressure is sealed off positively at every joint by three separate sealing surfaces. In torque capacity (to resist over-tonging) this "CS" joint far exceeds the collared type tubing joints.

In corrosive gas or gas-distillate fields the need for flush-bore tubing joints is extreme. Hydril "CS" tubing provides streamline flow through the joints, there being no shoulders to cause eddying in the flow of the corrosive fluid at the joints.

All these advantages combine in the Hydril "CS" tubing joint to make it uniquely suited to solving problems encountered in difficult producing fields. There are many fields where all these advantages are required. The gas-distillate fields generally are deep, and usually are characterized by high pressure and corrosive conditions. In these areas the producing problems can be solved with economy by using tubing equipped with Hydril "CS" joints. It is the excellent performance record of this joint under all these adverse conditions that testifies most graphically to the merit of the Hydril "CS" tubing joint.

ELEVATORS

Hydril "CS" tubing strings can be run on standard tubing elevators using elevator plugs to provide a lifting shoulder equivalent to a tubing collar. When tubing is to be round-tripped several times, time is saved by providing an elevator plug for each stand.

Or, if desired, the elevator plugs can be eliminated and the string handled on slip-type elevators, available for rental for 2⅜", 2⅞" and 3½" "CS" tubing.

HOW THE JOINT MAKES UP

As the pin is stabbed into the box, guiding bevels bring the joint into the full stabbed position and land it on two full starting threads. At this position the joint is loose-fitting to permit free stabbing and easy starting of the threads. During spinning up of the joint, both threads engage so that only a few turns are required for full make-up. The first seating occurs on the 14° internal seal. This contact usually stops free spinning. Moderate further make-up preloads this internal seal, and then the outside shoulder seats. This double seating can usually be achieved by torque application equivalent to that of hand tubing tong make-up. As the joint is further tonged up with power tools (to the make-up torque shown in Table No. 18) the bore shoulder seats, forming a final positive stop. In this made-up position the 14° inside seal and the 30° outside seal both are properly preloaded to establish pressure seals against both low and high pressures. The bore shoulder itself is, of course, a third pressure seal as well as a third and final stop to the make-up of the joint.

Table No. 18
HYDRIL "CS" JOINT FOR EXTERNAL UPSET TUBING

Size (O.D.) & Weight (Nominal)		TUBING			JOINT					See Table No. 21, Page 2599 for Burst and Collapse Ratings of Pipe	TENSION—(Pipe)† (Joint is Stronger than Pipe)			Recommended Make-Up Torque	
											J-55	N-80	P-105		
		Wall Thick.	I.D. (Nominal)	Drift Diam. (A.P.I.)	Pin Length	O.D. (Std.)	O.D. (Special)	I.D. (Bored)	Efficiency		Min. Yield	Min. Yield	Min. Yield	J-55	N-80 P-105
											1000 Lbs.	1000 Lbs.	1000 Lbs.		
Inches	Lbs.	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Percent					Ft.-Lbs.	Ft.-Lbs.
1 (1.315-O.D.)-1.8		.133	1.049	.955	2.187	1.582	.....	.970	116		27	40	52	300	400
1¼ (1.660-O.D.)-2.4		.140	1.380	1.286	2.187	1.883	.....	1.300	114		37	53	70	400	600
1½ (1.900-O.D.)-2.9		.145	1.610	1.516	2.187	2.113	.....	1.530	110		44	64	84	600	800
2 1/16	3.4	.156	1.750	1.656	2.187	2.330	.....	1.700	109		51	75	98	800	1100
2⅜	4.7	.190	1.995	1.901	2.272	2.700	2.630	1.945	106		72	104	137	1300	1800
2⅜	5.3	.218	1.939	1.845	2.272	2.700	.....	1.890	105		81	118	155	1300	1800
2⅞	6.5	.217	2.441	2.347	2.338	3.220	3.155	2.375	102		100	145	190	1700	2500
3½	9.3	.254	2.992	2.867	2.787	3.865	3.805	2.920	105		142	207	272	2500	3000
3½	10.3	.289	2.922	2.797	2.787	3.865	.....	2.878	101		160	233	306	2500	3000
4	11	.262	3.476	3.351	2.787	4.343	4.315	3.395	105		169	246	323	3500	3500
4½	12.75	.271	3.958	3.833	2.830	4.855	4.825	3.865	105		198	288	378	3500	3500

† Pipe Tension Strength Calculated on: J-55 = 55,000 Yield and 92,000 Ultimate. N-80 = 80,000 Yield and 105,000 Ultimate. P-105 = 105,000 Yield and 120,000 Ultimate.

Hydril "A" and "CA" and "CS" threads are interchangeable.

Hydril 4½" O.D. type "A" and "CS" and "EU" (casing) threads are interchangeable.

MANDRELS FOR RETRIEVABLE VALVES

FIGURE 1
Type "SSC" Mandrel with Type "S-O" Gas Lift Valve installed. Sliding sleeve valve is in open position. Fluid flows through the gas lift valve.

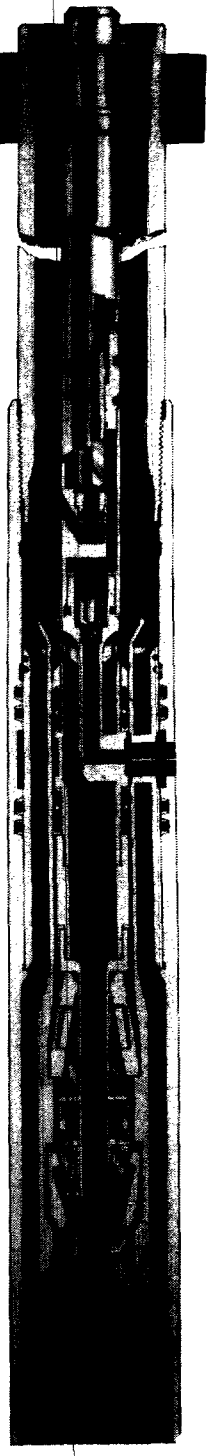

FIGURE 2
Type "V-2" Mandrel with Type S-O Gas Lift Valve installed. Fluid flows through by-pass in sliding sleeve, and through the gas lift valve.

These mandrels accommodate the gas lift valves described on the opposite page. Both types contain the GOT Sliding Sleeve Valve, through which communication between the casing and tubing may be opened or shut off with wire line tools. The sliding sleeve, which serves as the receiver for the gas lift valve, is fitted with snap rings that engage when the sleeve valve is in full open or fully closed position and thus secure the sleeve against accidental movement. A direct thrust load of 3200 pounds is required to unseat the snap ring from its groove. O-Rings supported by Teflon back-up rings provide the pressure seal around the sleeve. The mandrels are made of high tensile, corrosion-resistant materials, and are designed to outlast the tubing under all conditions.

The sleeve valve is closed on upward movement of the sliding sleeve, and opened on downward movement. The design of the mandrels and the gas lift valves which they accommodate is such that the sleeve valve is shifted to open position when a gas lift valve is installed, and shifted to closed position when the valve is retrieved. When circulation between casing and tubing is desired, any or all sleeve valves may be shifted by wire line tools without using gas lift valves.

Coupled with the features of the Type "S" Gas Lift Valve, this design provides these advantages:

1. The gas lift valve may be installed or retrieved in one run of the wire line.
2. Undesired communication between the casing and tubing never exists.
3. Gas lift valves may be installed or retrieved without equalizing pressures.
4. Concentric mounting of the gas lift valve facilitates engagement of the fishing tool.
5. Turbulence, erosion and deposits of sand and silt are minimized.
6. All types of valves of the same size are interchangeable in mandrels of the same size.
7. Welding has been eliminated from the mandrels.

TYPE "SSC" MANDREL

This mandrel is designed especially for dual completions and slim holes. It permits two strings of 1½" upset tubing equipped with wire line retrievable gas lift valves to be run inside 5½" O.D. casing, or two strings of 2" upset to to be run inside 7" O.D. casing, *without clamping*. The flow of fluid is through the gas lift valve.

Circulation between casing and tubing is provided by a series of drilled ports in the body of the mandrel, and slots in the sliding sleeve. The total area of the ports and slots is equal to the inside area of the tubing, as a result of which a Type "SSC" Mandrel serves as a *full capacity circulating valve* that may be opened or closed with wire line tools, and in which a gas lift valve may be installed whenever desired.

DIMENSIONS AND WEIGHTS

Type	Tubing Size	Outside Diameter	Inside Diameter	Length	Weight
SSC	1½"	2.250"	1 7/16"	30 5/16"	19½ lbs.
SSC	1½"	2.375"	1 7/16"	30 5/16"	21 lbs.
SSC	2"	2.910"	1 29/32"	27"	22 lbs.
SSC	2"	3.000"	1 29/32"	27"	23 lbs.
SSC	2½"	3.750"	2 11/32"	29"	26¼ lbs.

TYPE "V-2" MANDREL

The sliding sleeve in this mandrel contains a fluid by-pass with a flow capacity equal to that of the tubing. The gas inlet port is large enough to pass any required volume of injection gas, and provides for emergency circulation between casing and tubing.

DIMENSIONS AND WEIGHTS

Type	Tubing Size	Outside Diameter	Inside Diameter	Length	Weight
V-2	2"	4.125"	1 29/32"	48"	72 lbs.
V-2	2½"	4.750"	2 11/32"	48"	90 lbs.