



SIDE POCKET MANDREL

Parveen Side Pocket Mandrels allow use of standard wireline tools for installation and retrieval of different types of flow control devices.

MATERIALS :

Generally Low Alloy Steel AISI 4130 is used. For corrosive application, AISI 410 is used. Other materials are used as per customer's requirement.

FORGINGS :

Pockets & tool discriminators are closed die forged and are integral part of the pocket. Swages are forged from seamless mechanical tubing or it can be machined from solid bar stock. Forgings are made by using a precision closed die process. All forged parts are visually and dimensionally inspected by Quality Control before machining.

MACHINING :

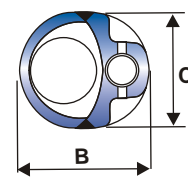
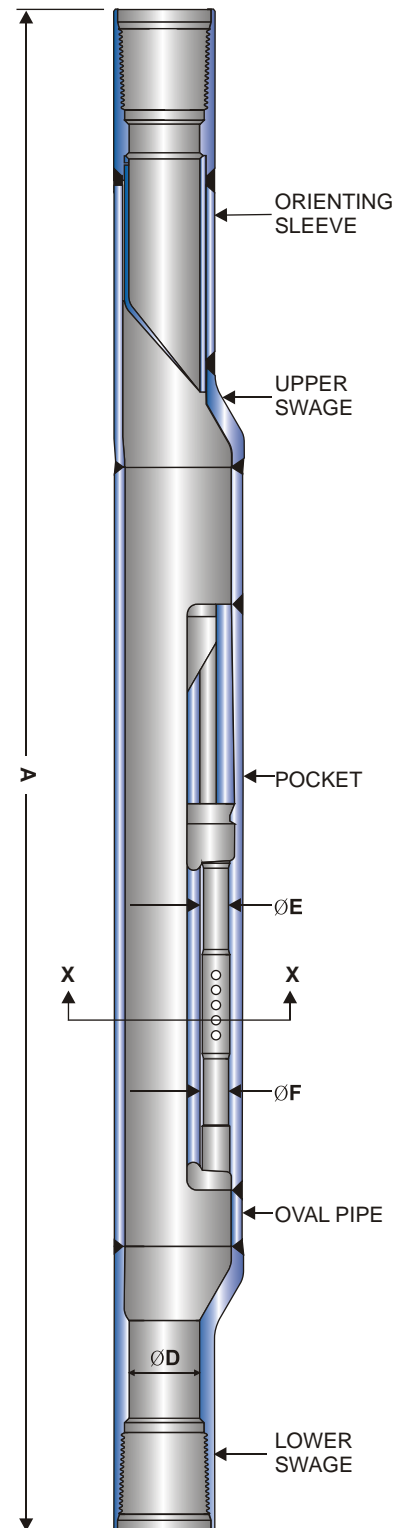
Pockets are machined using deep hole drilling & boring process that provides accurate polished bore diameters, alignment and better surface finish for packing seals. The swages are machined with precision accuracy. Threads are machined as per design specification. All components are dimensionally inspected.

WELDING HEAT TREATMENT :

Welding is done as per ASME Section VIII & IX with the use of proper welding electrodes. Full penetration welds take place when joining the swages and forged pocket are welded to the oval pipe. After welding, all external weld deposits are evenly ground down to match the outside profile. All mandrels are heat treated, Quenched & Tempered to 18-22 HRC, for corrosive service and 24-38 HRC for standard service application.

ASSEMBLED MANDREL :

After heat treatment and threading each mandrel is tested for hardness, internal and external drift and pressure test. Additional testing i.e. dye penetrant, ultrasonic, magnetic particle and radiography can also be provided as per customer requirement.



View-XX
TP Series Mandrel for
1-1/2" OD Valve (Welded Swages)



SIDE POCKET MANDREL

| ENGINEERING DATA FOR SIDE POCKET MANDRELS | | | | | | | | | | | | |
|--|-----------------|---------|-------|-------------------|------------|------------|----------|-----------|-------|-------|---|--|
| Tubing Size (Inch) | Valve OD (Inch) | Mandrel | | Dimensions (Inch) | | | | | | | Assembly Part No. a.) With Welded Swages b.) With Integral Swages | |
| | | Type | Shape | Length* A | Major OD B | Minor OD C | I.D ØD | Drift Dia | ØE | ØF | | |
| 2-3/8 | 1.0 | TMP | OVAL | 83 | 4.25 | 2.92 | 2.00 | 1.901 | 1.027 | 1.027 | a.) 238X1-D1901-SXXXX-XXW-X b.) 238X2-D1901-SXXXX-XXI-X | |
| 2-3/8 | 1.5 | TP | OVAL | 102 | 4.75 | 4.00 | 2.00 | 1.901 | 1.6 | 1.5 | a.) 238X2-D1901-SXXXX-XXW-X b.) 238X1-D1901-SXXXX-XXI-X | |
| 2-7/8 | 1.0 | TMP | OVAL | 85 | 4.75 | 4.00 | 2.441 | 2.347 | 1.027 | 1.027 | a.) 288X1-D2347-SXXXX-XXW-X b.) 288X1-D2347-SXXXX-XXI-X | |
| 2-7/8 | 1.5 | TP | OVAL | 103 | 5.50 | 4.59 | 2.441 | 2.347 | 1.6 | 1.5 | a.) 288X2-D2347-SXXXX-XXW-X b.) 288X2-D2347-SXXXX-XXI-X | |
| 3-1/2 | 1.0 | TMP | OVAL | 85 | 5.31 | 4.12 | 2.992 | 2.867 | 1.027 | 1.027 | a.) 350X1-D2867-SXXXX-XXW-X b.) 350X1-D2867-SXXXX-XXI-X | |
| 3-1/2 | 1.5 | TP | OVAL | 104 | 6.06 | 5.00 | 2.992 | 2.867 | 1.6 | 1.5 | a.) 350X2-D2867-SXXXX-XXW-X b.) 350X2-D2867-SXXXX-XXI-X | |
| 4.0 | 1.0 | TMP | OVAL | 86 | 5.85 | 5.00 | 3.476 | 3.351 | 1.027 | 1.027 | a.) 400X1-D3351-SXXXX-XXW-X b.) 400X1-D3351-SXXXX-XXI-X | |
| 4.0 | 1.5 | TP | OVAL | 107 | 6.63 | 5.55 | 3.476 | 3.351 | 1.6 | 1.5 | a.) 400X2-D3351-SXXXX-XXW-X b.) 400X2-D3351-SXXXX-XXI-X | |
| 4-1/2 | 1.0 | TMP | OVAL | 86 | 6.45 | 5.50 | 3.958 | 3.833 | 1.027 | 1.027 | a.) 450X1-D3833-SXXXX-XXW-X b.) 450X1-D3833-SXXXX-XXI-X | |
| 4-1/2 | 1.5 | TP | OVAL | 107 | 7.03 | 5.625 | 3.958 | 3.833 | 1.6 | 1.5 | a.) 450X2-D3833-SXXXX-XXW-X b.) 450X2-D3833-SXXXX-XXI-X | |
| 5.0 | 1.5 | TP | OVAL | 116 | 7.94 | 6.80 | 4.408 | 4.283 | 1.6 | 1.5 | a.) 500X2-D4283-SXXXX-XXW-X b.) 500X2-D4283-SXXXX-XXI-X | |
| 5-1/2 | 1.0 | TMP | OVAL | 87 | 7.94 | 6.80 | 4.778 | 4.653 | 1.6 | 1.5 | a.) 550X1-D4653-SXXXX-XXW-X b.) 550X1-D4653-SXXXX-XXI-X | |
| 5-1/2 | 1.5 | TP | OVAL | 108 | 7.44 | 6.05 | 4.00 | 3.833 | 1.6 | 1.5 | a.) 550X2-D3833-SXXXX-XXW-X b.) 550X2-D3833-SXXXX-XXI-X | |
| 5-1/2 | 1.5 | TP | OVAL | 108 | 7.94 | 6.80 | 4.778 | 4.653 | 1.6 | 1.5 | a.) 550X2-D4653-SXXXX-XXW-X b.) 550X2-D4653-SXXXX-XXI-X | |
| 7.0 | 1.0 | TMP | ROUND | 90 | 8.25 | 8.25 | 6.184 ** | 6.059 | 1.027 | 1.027 | a.) 700X1-D6059-SXXXX-XXW-X b.) 700X1-D6059-SXXXX-XXI-X | |
| 7.0 | 1.5 | TP | OVAL | 117 | 9.38 | 8.38 | 6.184 ** | 6.059 | 1.6 | 1.5 | a.) 700X2-D6059-SXXXX-XXW-X b.) 700X2-D6059-SXXXX-XXI-X | |

SIDE POCKET MANDREL

TMP and TP Series Side Pocket Mandrel :

PARVEEN TMP and TP Series Side Pocket Mandrels are consisting of forged pocket with integral tool discriminator, oval pipe, swages and orienting sleeves. Its orienting sleeve allows precise and proper alignment during the insertion of positioning devices / tools into the side pocket. Forged tool discriminator guides the proper diameter side pocket devices/tools into the mandrel pocket and deflects larger tools into the tubing bore to prevent damage to the positioning devices/tools.

In Gas Lift applications, high pressure gas injected into the casing annulus flows through the ports of the pocket in the gas lift valve and into the tubing. The standard pocket is ported between the seal bores to communicate with the casing annulus and the gas is circulated down the annulus through the gas lift valve into the tubing. These mandrels are used for tubing flow applications.

Both TMP and TP series feature multiple porting variations for specific applications i.e. annulus flow, chamber lift, fluid injection water flood installations.

TMP and TPC Series Side Pocket Mandrel :

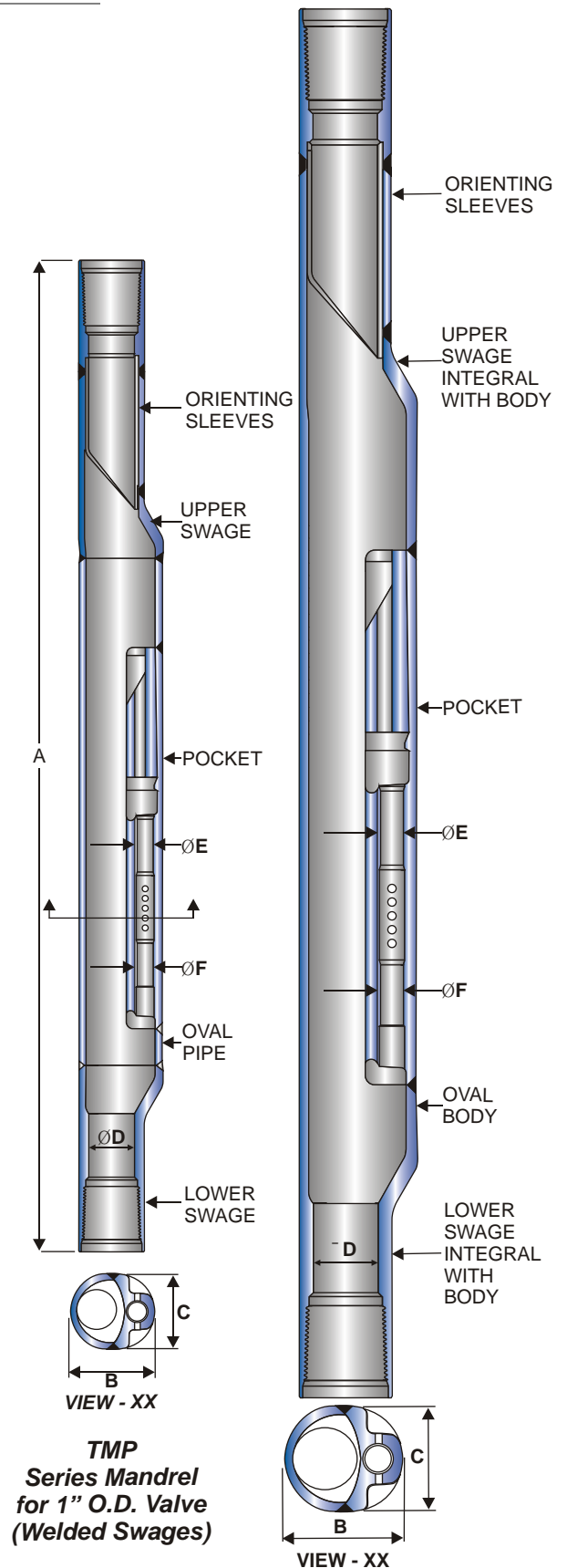
These mandrels are used in annulus flow applications in which a snorkel functions as an exhaust port. Snorkel located at the bottom of the side pocket, extends downward into casing annulus. The holes in the mandrel side pocket directly communicate with the tubing. High pressure gas injected into the tubing flows thru the port between the packing bores into the pocket of the mandrel, then thru the ports into the gas lift valve, downward through the snorkel and then finally into the casing.

TMPE and TPE Series Side Pocket Mandrel :

These mandrels mainly used in chamber lift applications. It has no ports in the side pocket for communication with the tubing. Instead of that, an exhaust port is located at the bottom of the side pocket. This port is extended downward into the casing annulus through a 1/2" pipe connected to the top packer of a chamber lift installation. In gas lift application, high pressure gas is injected into the casing annulus flows through the ports in the side of the mandrel, then through the ports in the gas lift valve and finally downward to the exhaust port.

TMPS and TPS Series Side Pocket Mandrel :

These mandrels are used in single string, multi zone fluid injection water flood installations. The casing exhaust port located at the bottom of the side pocket is used to protect the casing from high velocity turbulence related with water flooding. In water flood operations, water injected into the tubing flows into the mandrel side pocket, thru the water flood flow regulator valve and downward through the exhaust port. A non retrievable check valve can be attached directly to the exhaust port to prevent back flow from the annulus when the water flood regulator valve is removed.



TMP Series Mandrel for 1" O.D. Valve (Welded Swages)

TP Series Mandrel for 1.1/2" O.D. Valve (Integral Swages)



SIDE POCKET MANDREL

| PRESSURE RATING FOR SIDE POCKET MANDRELS | | | | | | | | |
|---|-----------------|--------------|--------------------------|--------------------|----------------------|----------|--------------------|----------|
| Tubing Size (Inch) | Valve OD (Inch) | Mandrel Type | Weight Lbs - F* (Kg - F) | Volume (Cubic Ft.) | Test Pressure (PSI)* | | | |
| | | | | | Standard Services | | Corrosive Services | |
| | | | | | Internal | External | Internal | External |
| 2-3/8 | 1.0 | TMP | 75.0 (34) | 0.47 | 8000 | 7000 | 6000 | 5500 |
| 2-3/8 | 1.5 | TP | 130 (59) | 0.88 | 7500 | 6500 | 6000 | 5000 |
| 2-7/8 | 1.0 | TMP | 121.25 (55) | 0.73 | 8000 | 7000 | 6000 | 5500 |
| 2-7/8 | 1.5 | TP | 180.77 (82) | 1.18 | 7500 | 6500 | 6000 | 5000 |
| 3-1/2 | 1.0 | TMP | 150.00 (68) | 0.84 | 8000 | 6500 | 6000 | 5000 |
| 3-1/2 | 1.5 | TP | 209.4 (95) | 1.43 | 8000 | 6500 | 7000 | 5500 |
| 4.0 | 1.0 | TMP | 205.0 (92) | 1.14 | 8000 | 6500 | 7000 | 5500 |
| 4.0 | 1.5 | TP | 236.0 (107) | 1.78 | 8000 | 6500 | 7000 | 5500 |
| 4-1/2 | 1.0 | TMP | 216.0 (98) | 1.38 | 7500 | 6000 | 6000 | 5000 |
| 4-1/2 | 1.5 | TP | 242.5 (110) | 1.92 | 7500 | 6000 | 6000 | 5000 |
| 5.0 | 1.5 | TP | 310.8 (141) | 2.84 | 8500 | 7000 | 6500 | 5500 |
| 5-1/2 | 1.0 | TMP | 262.3 (119) | 2.13 | 7500 | 6000 | 6000 | 5000 |
| 5-1/2 | 1.5 | TP | 291.0 (132) | 2.20 | 7500 | 6000 | 6000 | 5000 |
| 5-1/2 | 1.5 | TP | 297.6 (135) | 2.64 | 8500 | 7000 | 6500 | 5500 |
| 7.0 | 1.0 | TMP | 405.6 (184) | 2.8 | 7000 | 5500 | 5000 | 4500 |
| 7.0 | 1.5 | TP | 452.0 (205) | 4.17 | 7000 | 5500 | 5000 | 4500 |

NOTES:

- * Test Pressures given are for mandrels made of AISI-4130 materials heat treated for standard or corrosive environments. Test Pressures may be reduced due to end connection limitations.
- ** Weight and Length may vary depending upon end connection etc.
- *** For 7" TMP & TP Series other drift sizes can also be provided upon request.