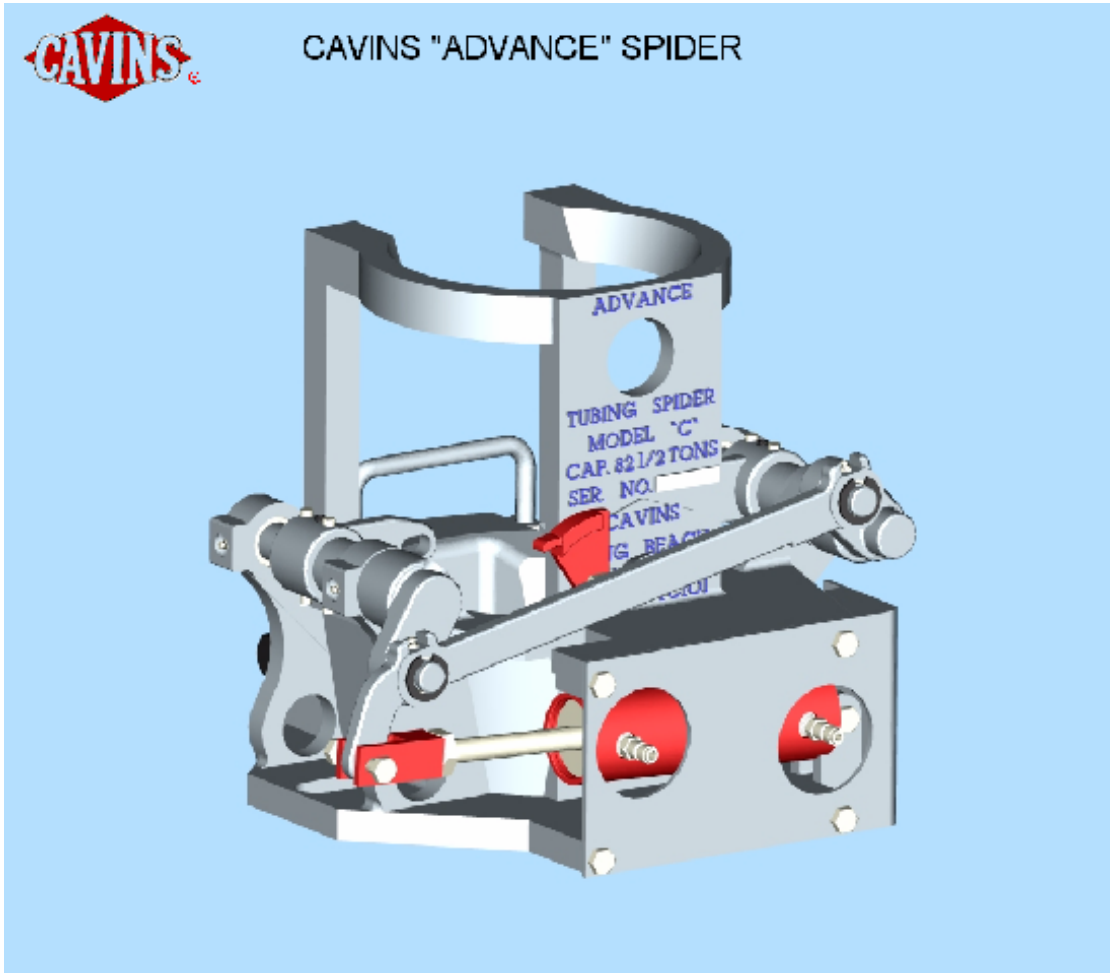




OIL WELL TOOLS
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**Cavins "advance"
Model "C-HD" Spider
(Air Operated)**

GENERAL INFORMATION:

The "Advance" Spider developed by the CAVINS CO. is considered to be the pioneer in power slips. Through years of experience and testing, many improvements have been made, which make the "Advance" Spider the leader in safe, economical, and troublefree handling of tubular goods. Heat-treated alloy steel is used throughout for the greatest possible strength and longest wearing life with a minimum of weight. The shafts are hardened alloy steel for longer life. Replaceable hardened steel bushings are fitted into the journal bearings. All bearings and journals are equipped with grease fittings for lubrication. Air cylinders and foot valves are mist lubricated through the air stream. All CAVINS "Advance" Spiders are equipped with a manually operated safety latch, which may be used to positively lock the slips in their set position. Because of the low operating pressure, the slips cannot release from the tubing until it has been raised by the elevators, thus guarding against a lost string in the event that the foot valve is tripped accidentally. The slips, shafts, and air operating mechanism are protected by guards to prevent damage caused by the elevators or other outside forces. Through research and field testing, our engineers are constantly on the lookout for additional improvements which will assure the man in the field of receiving the safest and most maintenance free equipment available.

A. APPLICATION:

The CAVINS "Advance" Spider is available in three models. The Model "B" Spider is designed for use with all A.P.I. Tubing sizes from 1.315" O.D. through 3-1/2" O.D. The Model "C" Spider is designed for use with all A.P.I. tubing and drill pipe sizes from 1.315" O.D. through 5-1/2" O.D. The Model "F" Spider is designed for use with all A.P.I. tubing, casing, and drill pipe sizes from 2-3/8" O.D. through 8-5/8" O.D. All CAVINS "Advance" Spiders may be used on a rotary table with an adapter plate, which fits into the master bushing drive square, thus centering the Spider on the rotary table. This also enables the manually operated Spider to be rotated.

The Model "B" and Model "C" Spider may be equipped with a gate and slips which are relieved to pass parallel strings of tubing. If the Spider is to be used with both single and parallel strings to any extent, we recommend that both kinds of slips and gates be ordered.

B. COMPRESSED AIR OPERATED SPIDER

All Models of CAVINS "Advance" Spiders are available for compressed air operation. The low operating pressure (40-65 P.S.I.) required by this type Spider makes it easily adaptable to air supply on any rig, or portable compressor if the rig is not so equipped.

Each compressed air operated Spider requires the following items:

1. One Spider body complete, for air operation.
2. One Slip assembly complete for each size tubing, casing, or drill pipe to be run. The Slip assembly Model Corresponding to the body assembly ordered.
3. One Air Filter Pressure Regulator with Gauge and Lubricator.
4. One Foot operated Air Control Valve assembly with Cover Guard.
5. Three lengths of Air Hose assemblies. One hose to connect the outlet of the lubricator to the inlet of the foot or hand valve, two to connect the valve with the air cylinder of the Spider.

C. HYDRAULIC OPERATED SPIDER:

All CAVINS "Advance" Spiders can be supplied or converted in our factory for hydraulic operation. When ordering a hydraulic conversion or unit, supply all details concerning the hydraulic system available, especially the system pressure. With the proper information, the Spider will be set up and fully adjusted for your individual system before leaving our factory. Each hydraulically operated Spider requires the following items:

1. One Spider body assembly complete, for hydraulic operation.
2. One slip assembly complete for each size tubing, casing, or drill pipe to be run. The slip assembly model corresponding to the body assembly model ordered.
3. One foot operated valve and pressure reducer assembly for hydraulic operation.
4. Four lengths of hydraulic hose (low pressure 250 P.S.I. working pressure):

Each length of hose has a female quick change coupling attached to each end. One length leads from the Pressure Reducer to the Foot Valve. Two lengths connect the Foot Valve with the Hydraulic Cylinder of the Spider. One hose connects the exhaust on the Foot Valve with the supply tank, acting as return line.

D. SLIPS:

A slip assembly is made up of four individual segments, which are machined together as a unit to form a matched set. Each matched set must fit into a master guage which is identical to the bowl in a Spider body, thereby assuring that all slip assemblies will fit in all Spiders of the same model. However, slip segments from one set of slips will not interchange with slip segments from another set of slips because they would not be matched sets. It is very important, that these sets are kept intact to insure proper gripping action. It is also important that adjacent segments within an assembly which are tied together with arm bolts and tie bolts always be assembled together when replacing arm bolts and tie bolts.

If a slip segment becomes lost or damaged, the remaining segments should be returned to the factory and a new segment machined to fit the remaining ones. A segment from one set of slips should never be substituted for a missing segment in another set of slips.

The wickers in the CAVINS "Advance" integral tooth slips type FC (Full Circle) will eventually become worn to the point where they do not hold tubing efficiently. When this occurs, the worn slips should be returned to the factory on a repair basis for rebuilding and converting them to take either chevron or circular button replaceable inserts.

E. MANUAL OPERATED SPIDER:

The slips for CAVINS Model "B" and Model "C" "Advance" Spiders may be temporarily operated manually by inserting a bolt, pipe nipple, or wrench handle into a socket provided in one of the cross-shafts. For permanent manual operation, all models of CAVINS "Advance" Spiders can be converted in our factory or supplied minus the compressed air operating mechanism and equipped with a permanently installed lever for manual operation. The CAVINS "Advance" Spiders are successfully used for "roundtrips" on rotary drilling rigs. An adapter plate is bolted to the bottom flange of the Spider, fitting into the A.P.I. square of the rotary table master bushing, thus enabling the Spider and slips to be rotated and foot operated by a floor man. Each manually operated Spider requires the following items:

1. One Spider body assembly complete, for manual operation.
2. One slip assembly complete for each size tubing, casing, or drill pipe to be run. The slip assembly model corresponding to the body assembly model ordered.



TECHNICAL DATA SPECIFICATIONS

SPECIFICATIONS	MODEL "B"	MODEL "C"	MODEL "CHD"	MODEL "F"	MODEL "G"
Material	Alloy Steel Heat Treated	Alloy Steel Heat Treated	Alloy Steel Heat Treated	Alloy Steel Heat Treated	Alloy Steel Heat Treated
Weight - Less Slips	190 Lbs.	310 Lbs.	362 Lbs.	1070 Lbs.	4000 Lbs.
Height to Top of Guard	15 1/2"	16 1/2"	16 1/2"	26 3/4" a. 17" to top of bowl without guard. b. 22 1/2" to highest point without guard	35" a. 17" to top of bowl without guard. b. 22 1/2" to highest point without guard
Base Dimensions	14" X 17"	16 1/2" X 18 1/2"	16 1/2" X 18 1/2"	28" X 28"	41" X 41 5/8"
Bolt Centers	11 1/8"-16 1/2"	12 3/4"-14 1/2"	12 3/4"-14 1/2"	18 3/4"-24 1/2"	31" to 37"
Gate Opening	4 1/4"	5 3/4"	5 3/4"	8 3/4"	13 3/4"
Bowl Opening	4 3/4" DIA.	6 1/2" DIA.	6 1/2" DIA.	10 1/8" Dia. API Standard	15 1/2" DIA.
Operating Air Pressure	35-45 PSI	40-50 PSI	40-50 PSI	60-80 PSI	250-300 PSI
Operating Hydraulic Pressure	250-275 PSI	250-275 PSI	250-275 PSI	275-300 PSI	300-350 PSI
Hydraulic Fluid Consumption of Cylinder	1/400 Cu. Ft./ Stroke	1/400 Cu. Ft./ Stroke	1/250 Cu. Ft./ Stroke	1/250 Cu. Ft./ Stroke	On Request
Tubular Goods Range	1.315"-3 1/4" O.D.	1.315"-5 1/4" O.D.	1.315"-5 1/4" O.D.	2 3/8"-8 5/8" O.D.	2 3/8"-13 3/8" O.D.

CAPACITY (HOOK LOAD)

Maximum load capacity with an ample safety factor	110,000 Lbs.	165,000 Lbs.	250,000 Lbs.	320,000 Lbs.	700,000 Lbs.
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To calculate maximum setting depth of string, divide the maximum load capacity by the weight per foot Threaded and Coupled ("T & C") of the tubular goods to be handled.

For slips with Circular Button Inserts (Type "CBI") and Strip Inserts (Type "SI"), reduce calculated setting depth by 40%.

For slips with Chevron Inserts (Type "CI"), reduce calculated setting depth by 25%.

For slips with Full Circle Wickers (Type "FC"), no reduction of the calculated setting is necessary.

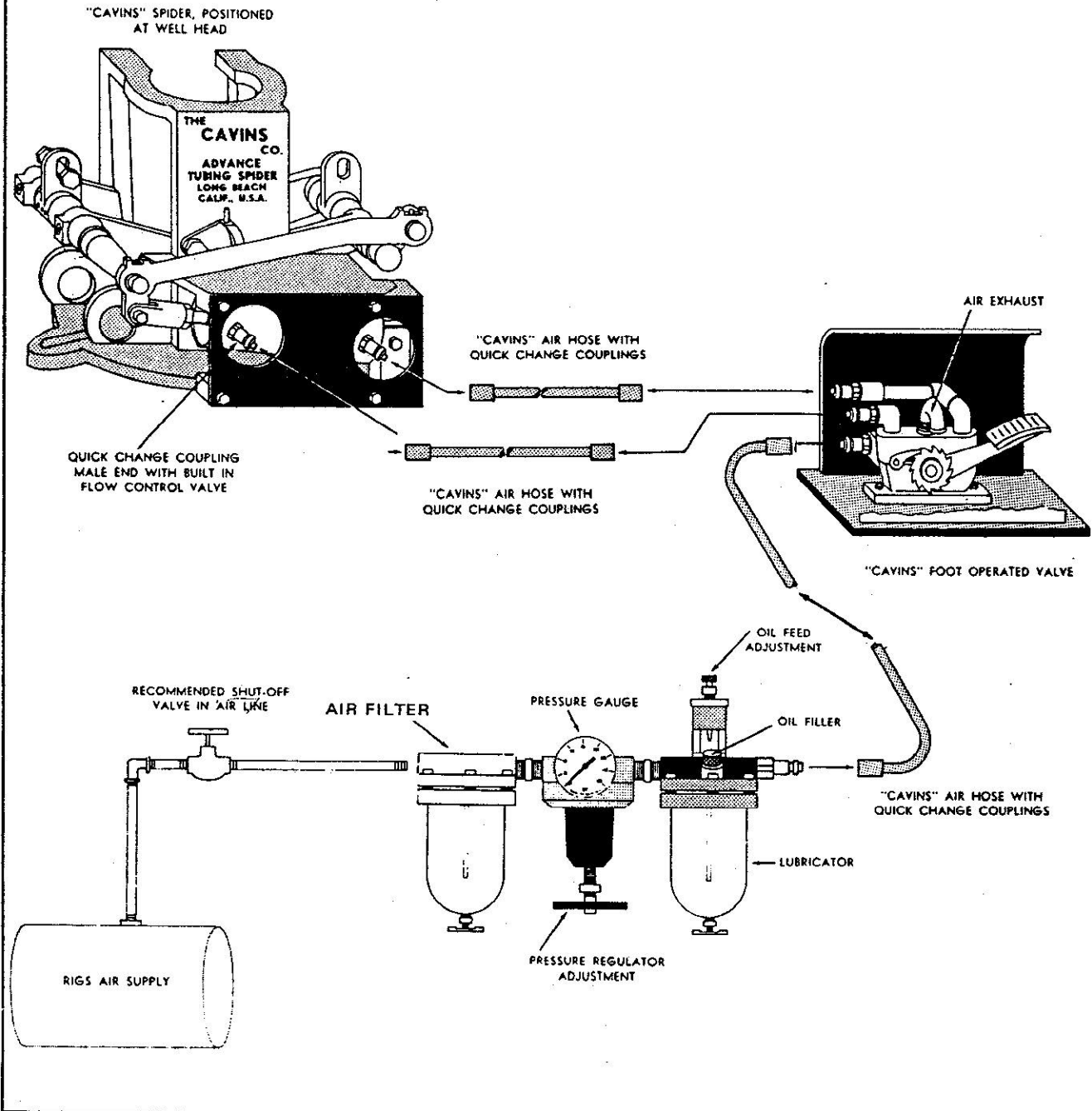
For slips with Full Circle Inserts (Type "FCI"), no reduction of the calculated setting is necessary.

For slips with Horizontal Tooth Inserts (Type "HTI"), for Model "F" Spider only, reduce calculated setting depth by 25% for drill pipe only.

GENERAL INFORMATION

TYPICAL INSTALLATION OF AN AIR-OPERATED SPIDER

TYPICAL INSTALLATION OF AN AIR-OPERATED SPIDER





CAVINS "ADVANCE" CASING AND TUBING SPIDERS GENERAL INFORMATION

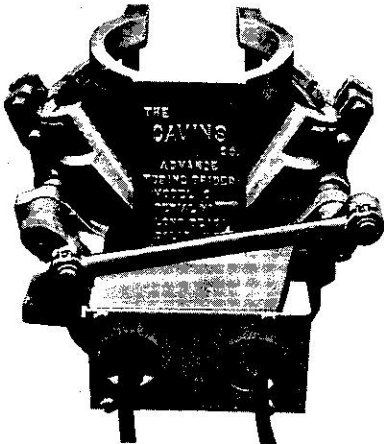


Figure 1
Tubing Spider Complete with Slips.

AVAILABLE FOR
AIR, HYDRAULIC OR
HAND OPERATION

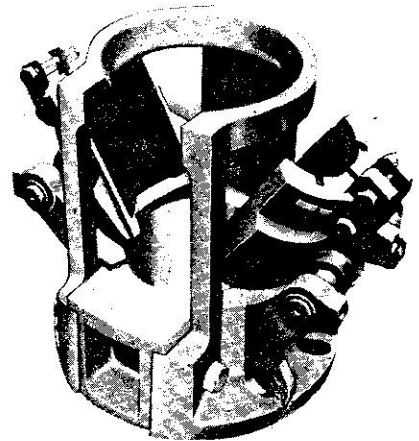


Figure 2
Tubing Spider Complete with Slips.

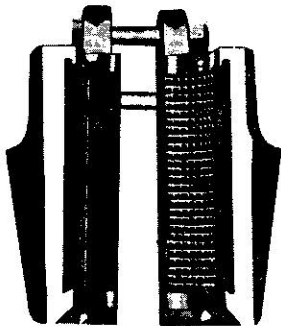


Figure 3
Type "FCR" Slips with full circle type replaceable inserts.

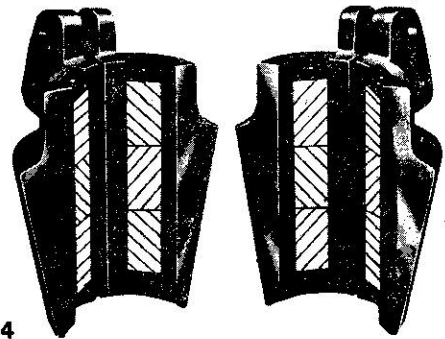


Figure 4
Type "TD" Slips with replaceable Chevron Inserts.

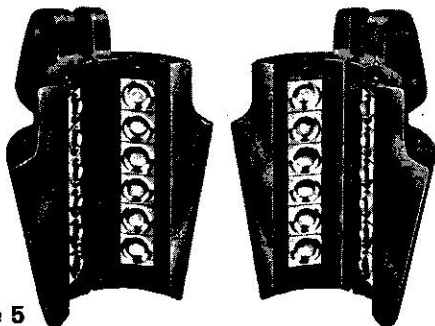


Figure 5
Type "TD" Slips with replaceable Circular Button Inserts.

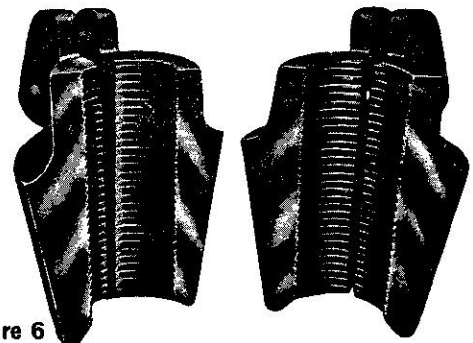
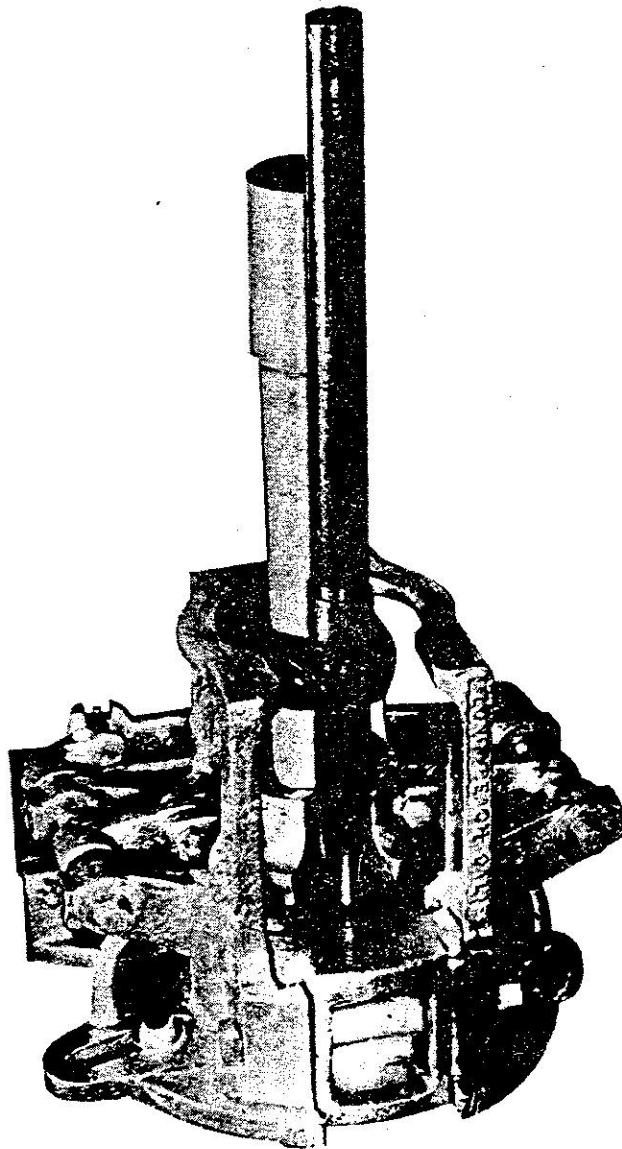


Figure 6
Regular Full Circle Type Slips.

**GENERAL
INFORMATION**

FOR MODELS "B", "C" & "F"

**CAVINS "ADVANCE" SPIDER FOR PARALLEL STRING OPERATION**

It is necessary to supply a special Gate and Slips, without alteration to the Spider-Body, when handling Parallel Strings or a string and electric cable for submersible Deepwell Pumps.



INSTALLATION INSTRUCTIONS for CAVINS "Advance" Air Powered Automatic Spider, for handling Tubing, Casing and Drill Pipe.

COMPONENTS CONSISTING OF:

Spider Body Assembly complete with Slips.
Air Control Valve (Foot or Hand Operated)
Air Filter Pressure Regulator with Gauge
and Lubricator Unit.
Three (3) lengths of 3/8" Oil Proof Hoses
with Quick Change Couplings attached.

1. The Rig should have available an air source outlet line with a 3/8" valve, preferable a Globe type valve of 150#/200# class. This is to isolate air to the Spider. (This outlet to be as near to the Rig operator as convenient)
2. Next mount Air Pressure Regulator/Mist Lubricator on draw works guard, near the rig operator, and considering a place where the unit will not be damaged by being hit with tools or other objects.
3. Using 3/8" pipe, copper tubing, or airhose, connect air source to the inlet of the Air Pressure Regulator.
4. Install male half of the Quick Change Coupling to outlet of Mist Lubricator.
5. Using one length of 3/8" hose, with the female Quick Change Couplings attached, and of sufficient length to reach foot operated valve at operators position. This air source line connects to lower male half of Quick Change Coupling in foot valve (Air Inlet). There are three (3) male couplings on the foot valve. The two male couplings, side by side are connections to attach hoses to the Air Cylinder of the Spider.

The hoses from the Foot Valve to the Air Cylinder need not be matched with fittings of the Air Cylinder as the Foot Valve is of rotary type and will automatically be correct with the Air Cylinder Piston. One stroke of the Foot Valve Operator changes direction of input air to either raise or lower the Slips.

6. Before connecting the hose to the Foot Valve, blow it out with air to eliminate all dirt, clean Quick Change Couplings again before connecting the two hoses from the Foot Valve to the Air Cylinder of the Spider, blow them out with the air operating Foot Valve several times.
7. After the Quick Change Male Couplings on the Air Cylinder have been wiped clean, squirt a few drops of light (SAE10) oil into the cylinder and Foot Valve before connecting the two hoses to it.

OPERATING INSTRUCTIONS

1. After the hoses are properly connected to Foot Valve and Tubing Spider with the proper size slips, it will be necessary to regulate operating air pressure and mist lubricator.
 - A. The Air Pressure Regulator Stem turns right and left. To increase pressure turn the stem to the right, to decrease pressure turn the stem to

the left. Operate Foot Valve lever, if the slips do not raise. Increase pressure till slips raise, use only sufficient air pressure to raise slips quickly, but not so hard as to cause the slips to make a pounding noise, as excessive air pressure will result in undue wear on bolts, arms and shafts. 40-60 PSI air pressure should be ample to operate the slips properly.

B. When the proper operating air pressure is determined, fill the lubricator with a light motor oil of about SAE 10 weight. In hot climates a heavier oil may be used

2. To adjust the lubricator, rapidly cycle the foot valve lever, watching the amount of oil in sight-feed glass being dispensed. A proper amount is one drop per six (6) cycles of the foot valve, turn adjusting stem to the right for less oil, left for more oil.

It is important to have some oil going through the system as it will be noted that at each movement of the foot valve to change position of the slips, an amount of air is exhausted out of a 180 degree elbow on top of foot valve downward onto foot lever, thus keeping the lever ratchet oiled and the force of air blows away dirt that may be on the ratchet.

- *3. It will be noted that during the adjustment of air pressure the slips will move slower during the setting cycle than during the lift cycle. This is due to a flow control valve in the male half of the Quick Change Coupling in the Air Cylinder where the air cylinder piston rod comes out of the cylinder.

If the action of the slips is too slow, remove the male half of the coupling from the cylinder. There is an allen screw with $\frac{1}{4}$ " hex wrench recess in the end of the fitting, remove this screw, and remove the steel ball. Then a valve seat can be seen having notches indented in the seat. Using a $\frac{1}{4}$ " chisel, make notches slightly deeper or make at least two more notches. This is to slightly increase flow of air. This will speed up the slip action. This is a deliberate control of air to soften contact of slip-face with the wall of the pipe, so as not to batter gripping members of slips when contacting the pipe.

Do not increase air pressure to speed up slips if they are too slow, as this only aggravates the tendency of the slips to raise too rapidly. Correct this situation by adjusting the flow control valve.

4. It may be necessary to change air pressure when changing the size of the slips.

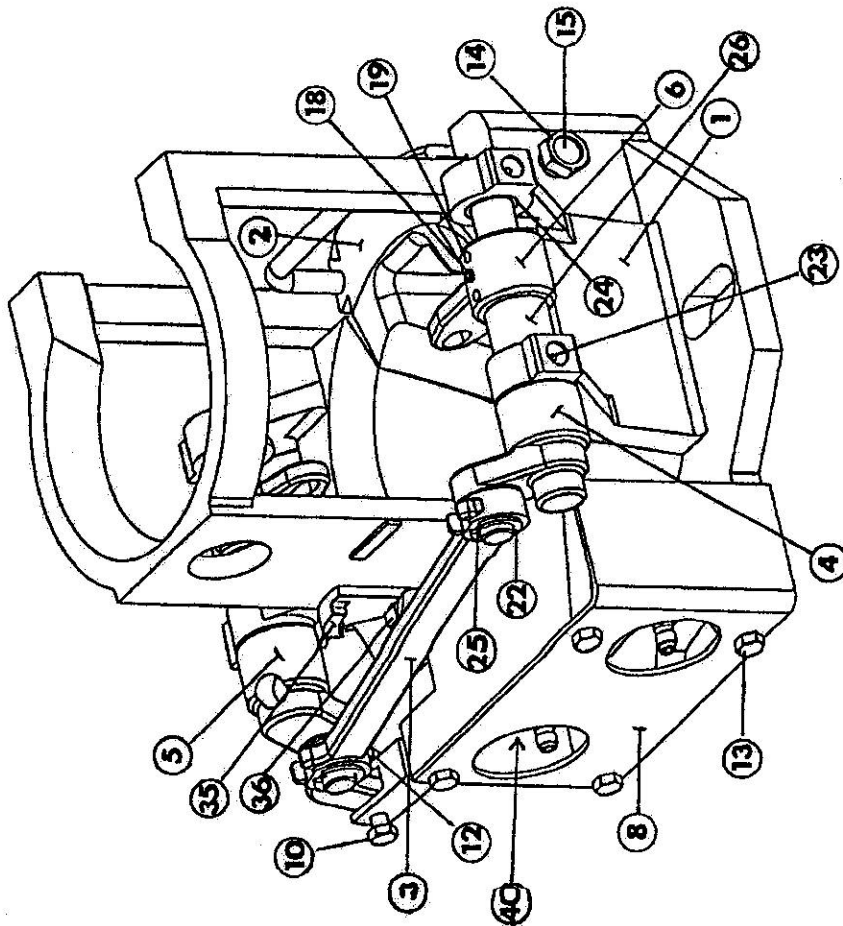
EXAMPLE: Original pressure was adjusted for 2 $\frac{7}{8}$ " slips and now 3 $\frac{1}{2}$ " slips are to be used. Slightly less pressure can be used as 3 $\frac{1}{2}$ " slip bodies are of lighter weight.

5. When handling Drill Pipe, an Adapter Plate which fits into the API Drive Square of any make of Rotary Table Master Bushing, is bolted to the flange of the Spider. When running Drill Pipe into the hole, the Rotary Table is not revolving, therefore the air cylinder can be used to actuate the Slips. Coming out of the hole, both air hoses attached to the Air Cylinder are disconnected and the Spider is manually operated. The Spider may also be manually actuated when running Drill Pipe into the hole, if so desired.

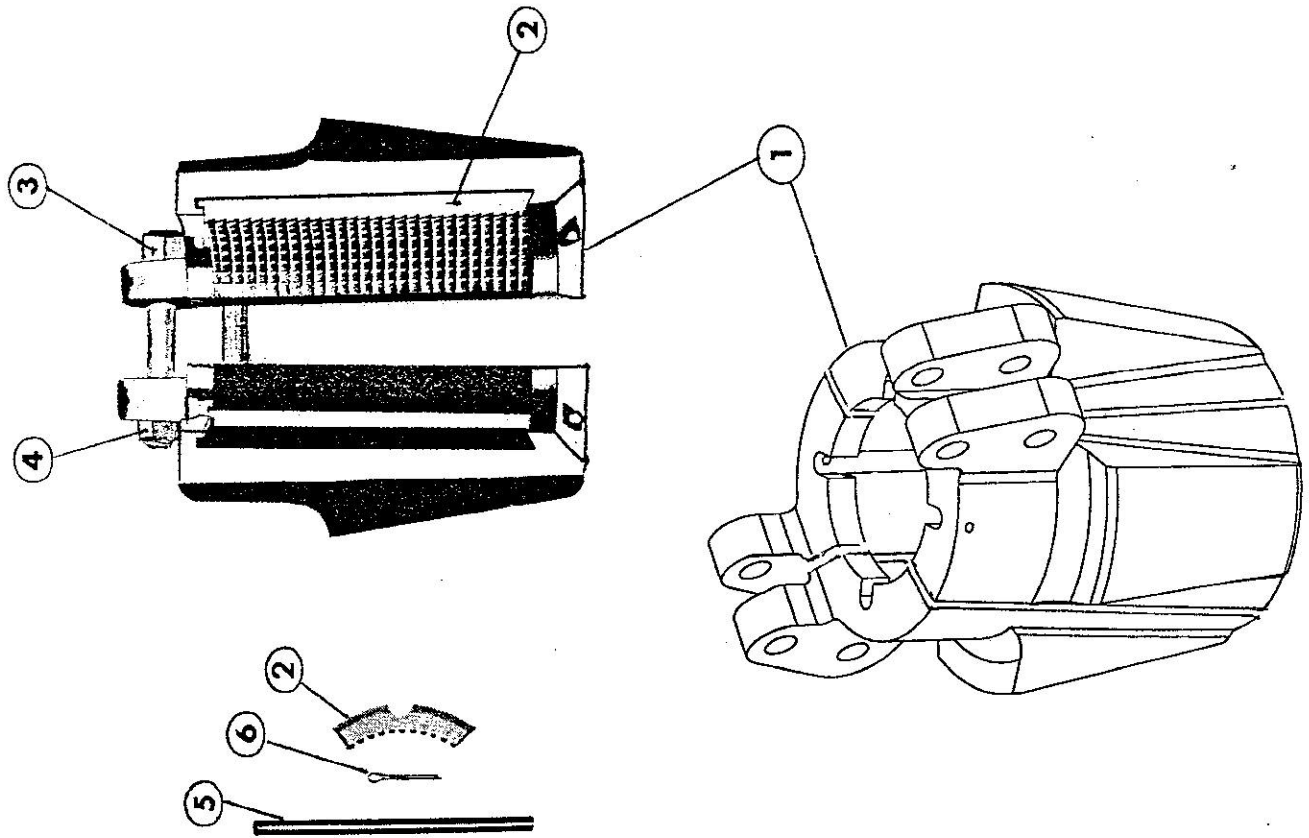
- * NOTE: On the Model "F" Spider the flow control valve is separate from the Male Quick Change Coupling and can be easily adjusted by tightening or loosening the valve stem.

Parts for model: TC100-S-HD air spider

REF#	PART #:	DESCRIPTION:	QTY.	REQ:
1	TC101-HD	Spider body less gate	1	
2	TC102-SF	Gate, semi-finished	1	
3	TC103	Link	1	
4	TC104	Shaft, left hand crank	1	
5	TC105	Shaft, right hand crank	1	
6	TC106	Lifting Arm	2	
8	TC108	Safety guard for cylinder	1	
10	TB110	Bolt for cylinder	2	
12	TB112	Nut for cylinder bolt	2	
13	TB113	Cap screw for cylinder guard	4	
14	TC114	Nut for gate bolt	1	
15	TC115-HD	Bolt for gate	1	
18	TB118	Set screw for lifting arm	2	
19	TB119	Taper Pin for lifting arm	4	
22	TB122	Retaining Ring for Link	2	
23	TB123	Grease fitting	6	
24	TC124	Bushing for shaft	4	
25	TB125	Bushing for link	2	
26	TC126	Spacer for shaft	2	
35	TB135	Safety latch	1	
36	TB136	Bolt for safety latch	1	
40	TB140-N	Air cylinder assembly	1	
n/a	TB140-R	Air cylinder repair kit: (2) TB144 large o-ring (4) TB145 cyl head o-ring (2) TB146 piston rod o-ring (2) TB147 retaining ring	1	
n/a	TC100-R-LC	Repair kit for C spider: (1) TC104 shaft left hand crank (1) TC105 shaft right hand crank (2) TC106 lifting arm (1) TC114 nut for gate bolt (1) TC115-HD bolt for gate (4) TB119 taper pin for lifting arm (2) TB122 retaining ring (6) TB123 grease fitting (4) TC124 bushing for shaft (2) TB125 bushing for link (2) TC126 spacer for shaft	1	



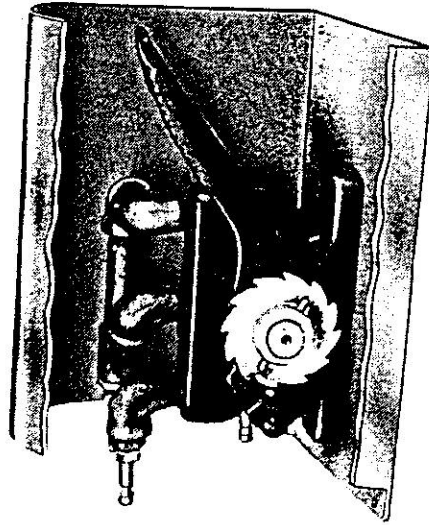
TC100-S-HD
Model "C-HD" Air Operated Tubing Spider



REF#	PART #:	DESCRIPTION:	QTY. REQ:
1	TC600-FCR-1	FCR slip body for 1.315 to 2.063" (33 mm to 52 mm) OD tubing, less inserts with retaining pins.	1 set
2	TC651-2.063x1.315	FCI inserts for 1.315" OD tubing	1 set
2	TC651-2.063x1.660	FCI inserts for 1.660" OD tubing	1 set
2	TC651-2.063x1.900	FCI inserts for 1.900" OD tubing	1 set
2	TC650-2.063	FCI inserts for 2.063" OD tubing	1 set
1	TC600-FCR-2	FCR slip body for 2.375 to 3.500" (60 mm to 89 mm) OD tubing, less inserts, with retaining pins.	1 set
2	TC651-3.500x2.375	FCI inserts for 2.375" OD tubing	1 set
2	TC651-3.500x2.875	FCI inserts for 2.875" OD tubing	1 set
2	TC650-3.500	FCI inserts for 3.500" OD tubing	1 set
1	TC600-FCR-3	FCR slip body for 3.500 to 4.500" (89 mm to 114 mm) OD pipe, less inserts, with retaining pins.	1 set
2	TC651-4.500x3.500	FCI inserts for 3.500" OD tubing	1 set
2	TC651-4.500x4.000	FCI inserts for 4.000" OD tubing	1 set
2	TC650-4.500	FCI inserts for 4.500" OD tubing	1 set
3	TB116	Bolt for slip body	4 each
4	TB117	Nut for slip bolt	4 each
5	TC601	Retaining pin for inserts	4 each
6	TC602-S	Cotter pin	4 each

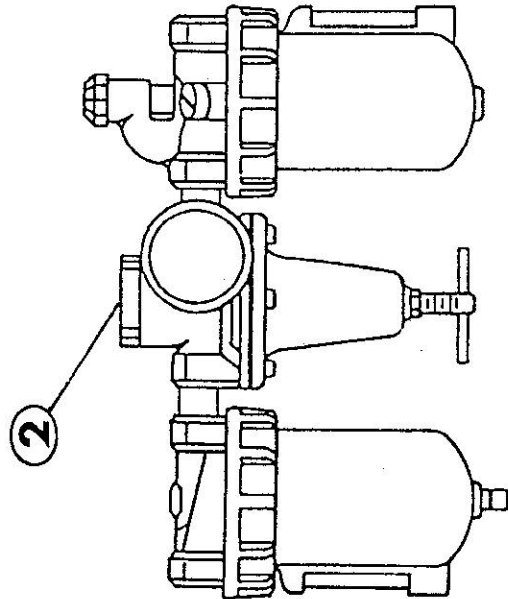
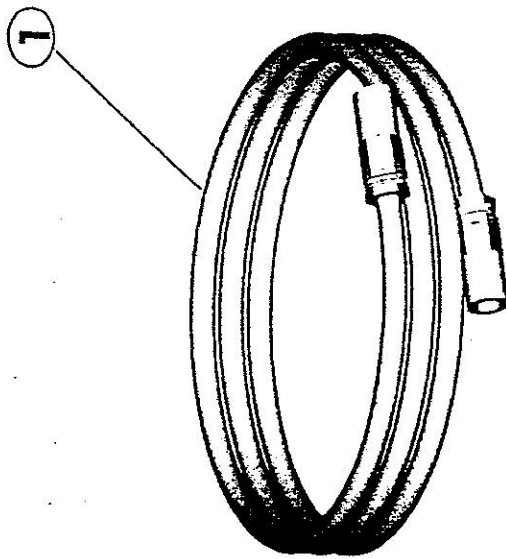
TC600-FCR

Full Circle Slip Body, FCI inserts & related parts



PART #:	DESCRIPTION	QTY. REQ:
TB200	AIR CONTROL VALVE-foot operated (3/8") Ratchet type, with Quick Change Hose couplings, male end, and Safety Cover Guard.	1
TB200-R	AIR CONTROL VALVE REPAIR KIT CONSISTING OF: (2) TB265 "O" Ring (2) TB276 Roll Pin for Ratchet (1) TB214 Gasket, Valve Repair (1) TB280 Tube of Rubber Cement	1

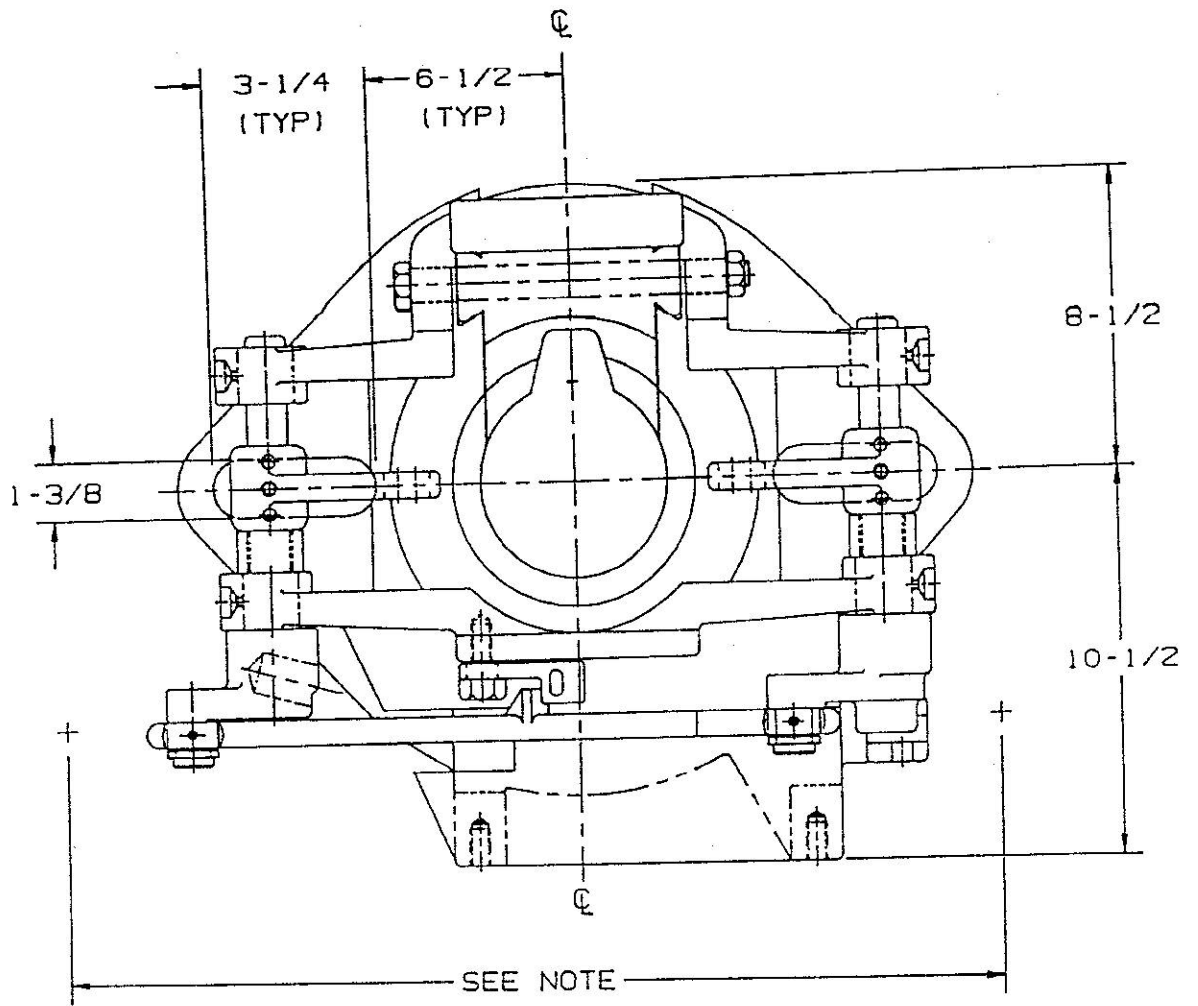
TB200
Air Control Valve Assembly and Repair Kit



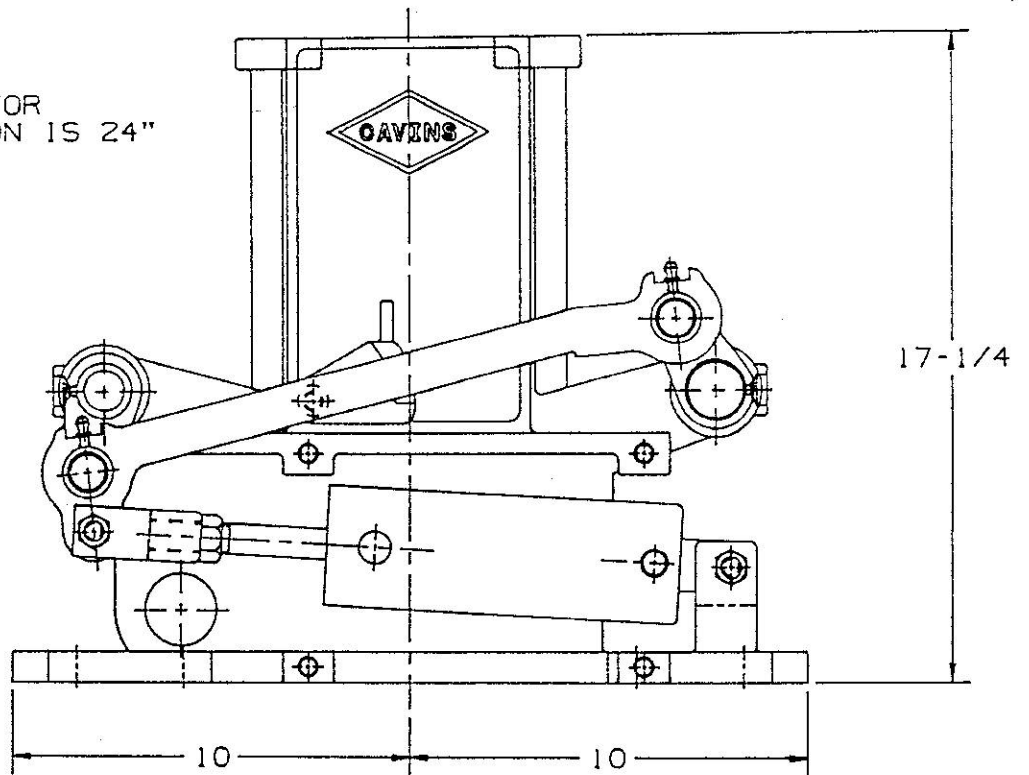
REF#:	PART#:	DESCRIPTION:	QTY. REQ:
1	TB300-15	Air Hose Assembly 15 feet long (4.5 meters) complete with quick change fittings. Consisting of: (1) TB301-15 air hose only 15' long (2) TB303 hose ferrules (2) TB306 barbed hose stem (2) TB305 quick change coupling (female)	3 each
2	TB400	Air Filter, Pressure Regulator, Gauge and Lubricator Assembly	1 each

TB300/400

Air Control accessories



NOTE: MAXIMUM WIDTH FOR PROPER OPERATION IS 24"



MODEL "C-HD" SPIDER ASSEMBLY MOUNT DIMENSIONS