
MAINTENANCE MANUAL

Double Acting Telescopic cylinder no. :

*HYCO 091-7010-0
OEM 01-0788*



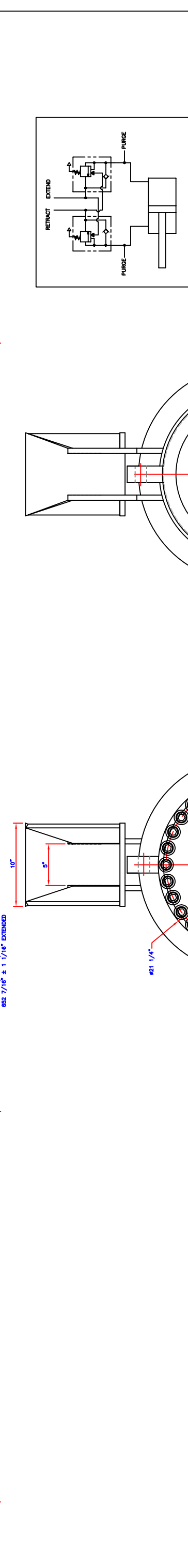
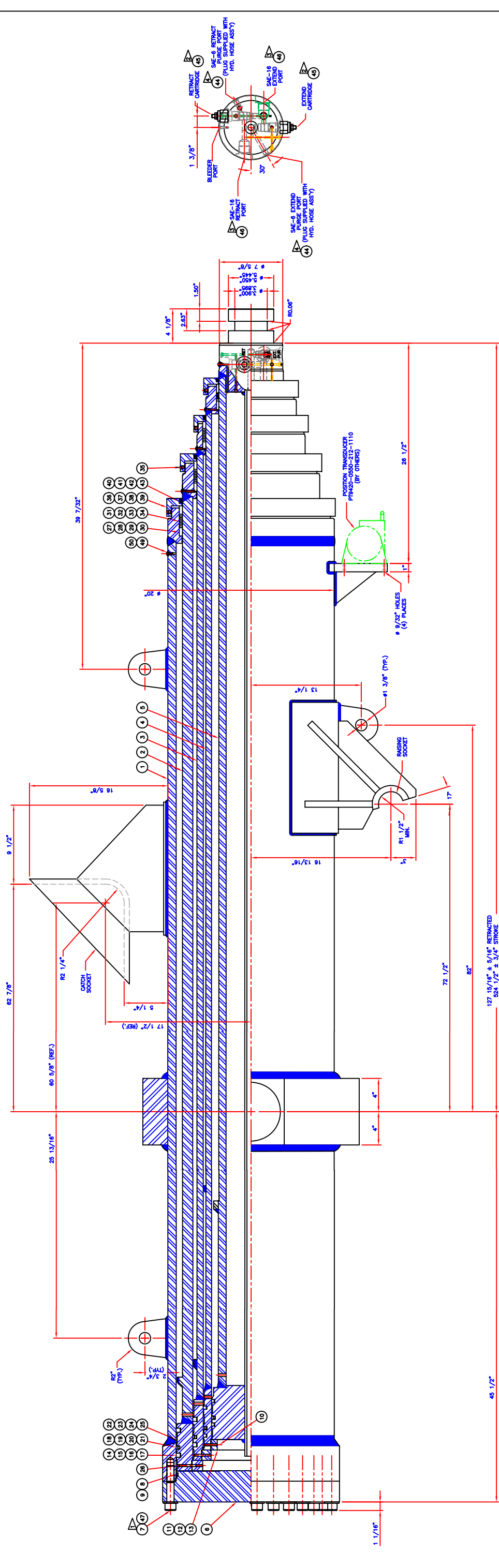
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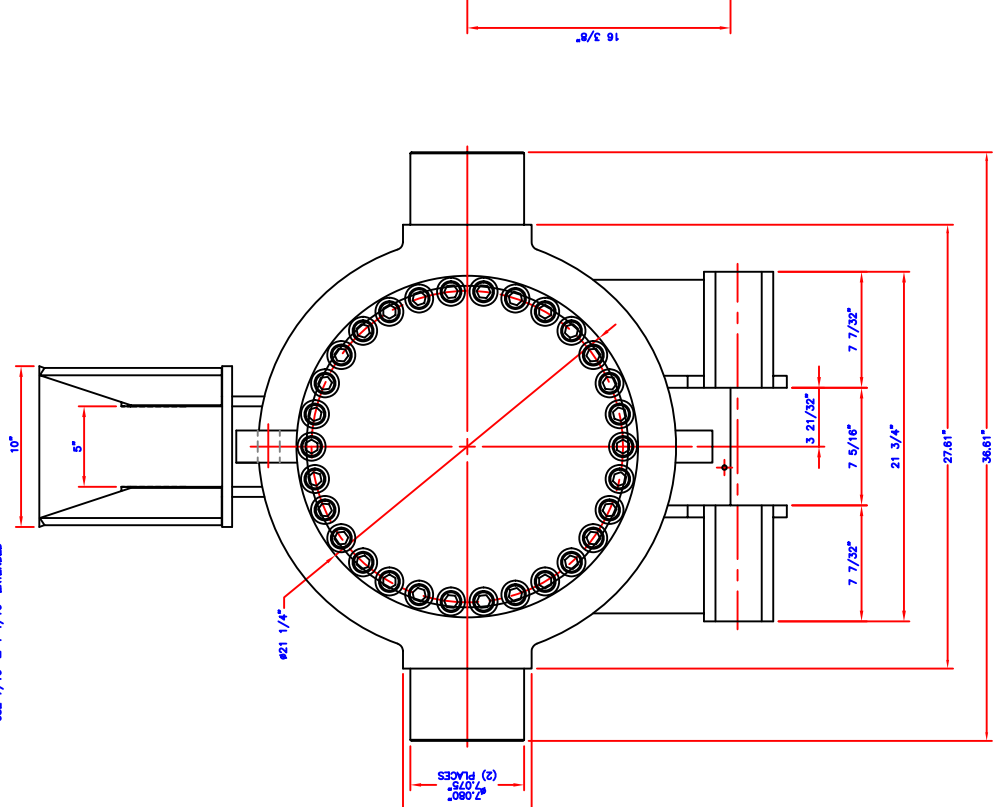
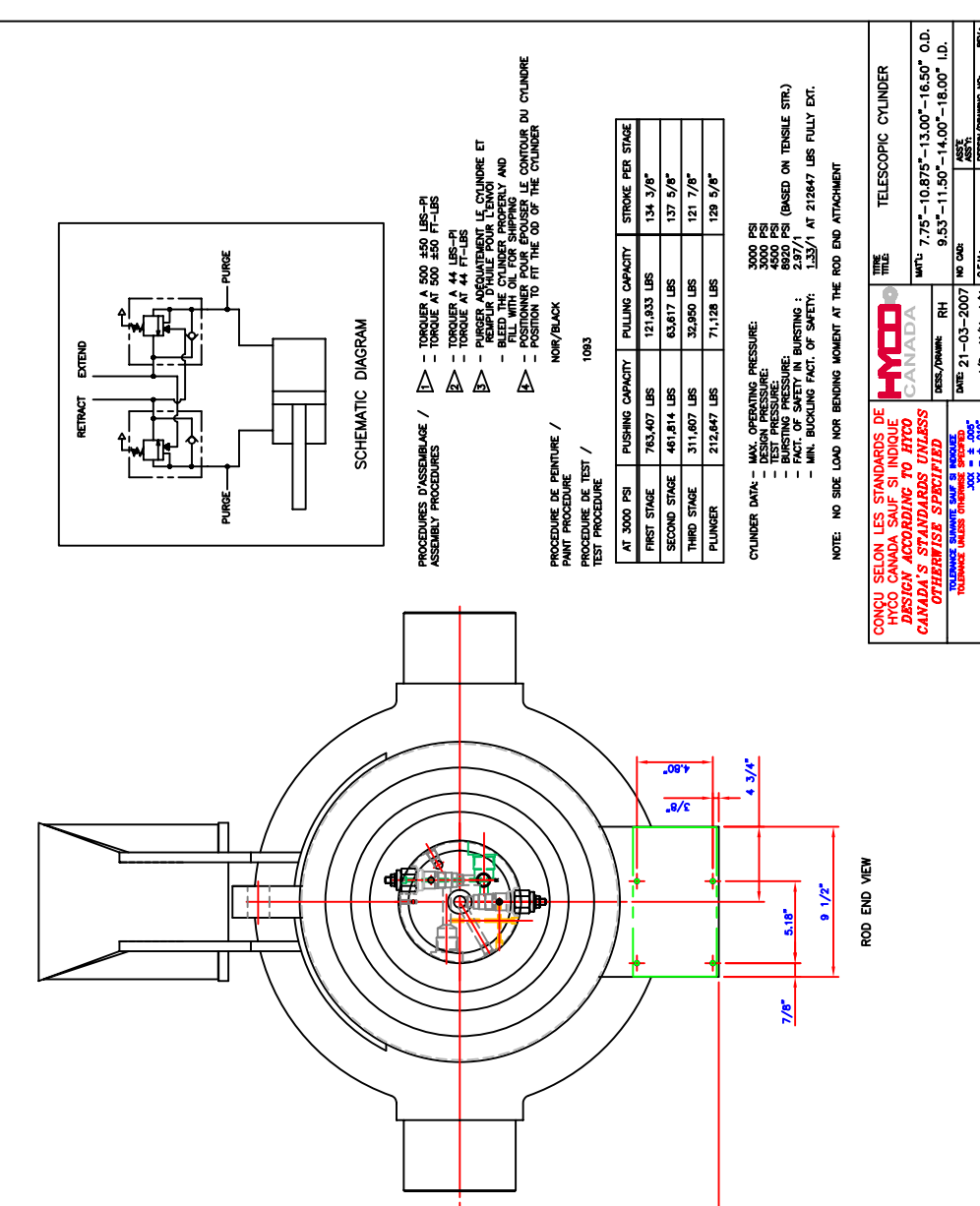
TABLE OF CONTENTS

1.	CYLINDER PARTS LIST	3
2.	OPERATING CONDITIONS	4
3.	MAINTENANCE	4
4.	STORAGE	4
5.	CYLINDER DISASSEMBLY	5
5.1.	GENERAL CONSIDERATIONS BEFORE DISMANTLING A CYLINDER.....	5
5.2.	DISASSEMBLY PROCEDURES	5
6.	SEALS CHANGE REQUIREMENTS	8
7.	CYLINDER ASSEMBLY	8
7.1.	PROCEDURES	8
7.2.	BLEEDING PROCEDURE.....	10
7.3.	PROOF TESTING	11
7.4.	COVER ADJUSTMENT.....	11
8.	ASSISTANCE	12



IT	QTE	NO	DESCRIPTION	IT	QTE	NO	DESCRIPTION
30	2	178-4146-6	BRONZE GUIDE # 7.750" LD.	1	1	382-1821-0	SEAL KIT
29	2	178-4082-1	BRONZE GUIDE # 10.875" LD.				
28	2	178-4082-4	BRONZE GUIDE # 13.000" LD.				
27	2	178-4146-7	BRONZE GUIDE # 16.500" LD.				
26	1	538-0816-0	SPRING PIN				
25	2	237-8876-0	WEAR-RING 9.500" X 1"				
24	2	237-8885-0	WEAR-RING 11.500" X 1"				
23	2	237-8885-0	WEAR-RING 14.000" X 1"				
22	2	237-8916-0	WEAR-RING 18.000" X 1"				
21	1	238-5330-1	CHEMCAST # 9.530"				
20	1	238-5335-0	CHEMCAST # 11.500"				
19	1	238-5349-0	CHEMCAST # 14.000"				
18	1	238-5241-0	ITER # 18.000"				
17	2	238-5043-2	CAST IRON PISTON RING # 9.530"				
16	2	238-5047-0	CAST IRON PISTON RING # 11.500"				
15	2	238-5057-0	CAST IRON PISTON RING # 14.000"				
14	2	238-5059-0	CAST IRON PISTON RING # 18.000"				
13	1	178-2117-0	STOPPER NUT				
12	1	178-2109-0	STOPPER NUT				
11	1	178-2119-0	STOPPER PIN				
10	2	538-0810-0	SPRING PIN				
9	1	238-8464-0	BACK-UP				
8	1	238-8464-1	O-RING				
7	30	508-1436-5	SHCS 7/8-14 UNF X 4 1/2" LG.				
6	1	191-0914-5	CYLINDER END CAP				
5	1	191-0917-0	PLUNGER # 7.750"				
4	1	191-0916-0	STAGE # 10.875"				
3	1	191-0915-0	STAGE # 13.000"				
2	1	191-0914-0	STAGE # 16.500"				
1	1	191-0913-0	MASTER TUBE				

IT	QTE	NO	DESCRIPTION	IT	QTE	NO	DESCRIPTION
50	13	A0912	STAT-O-SEAL (BLEEDER)				
49	13	FS-13201	BLEEDER BOLT				
48	1	178-8785-4	STEEL SHD (NOT SHOWN)				
47	30	532-0014-1	WASHER #7/8"				
46	2	248-5563-0	SAE-16 ALLEN STEEL PLUG				
45	2	214-8948-0	VALVE 1SEB90F3584 SET TO 3800 PSI				
44	1	178-5007-1	HIGH PRESSURE INT. HOSE ASSY (NOT SHOWN)				
43	1	239-1101-2	WIPER # 7.750"				
42	1	239-0874-1	WIPER # 10.875"				
41	1	239-0879-2	WIPER # 13.000"				
40	1	239-1187-2	WIPER # 16.500"				
39	1	178-1091-3	CYLINDER NUT				
38	1	178-1091-4	CYLINDER NUT				
37	1	178-1091-5	CYLINDER NUT				
36	1	178-1091-6	CYLINDER NUT				
35	4	511-0803-4	SET SCREW # .375" X .375"				
34	1	237-8683-0	V-PACKING SET # 7.750"				
33	1	237-8682-0	V-PACKING SET # 10.875"				
32	1	237-8680-0	V-PACKING SET # 13.000"				
31	1	237-8683-0	V-PACKING SET # 16.500"				



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NOTE: NO SIDE LOAD NOR BENDING MOMENT AT THE ROD END ATTACHMENT

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HYCO CANADA

DATE: 21-03-2007
 DESK/ANMER: RH
 NO. CRD: 2007-03-01
 J/D - M/M - A/Y: / /
 APPR: / /
 SCALE: 3/16 : 1
 Dwg No: 091-7010-0

2. OPERATING CONDITIONS

- The maximum operating pressure must not exceed 3000 psi (207 Bar).
- The contamination level of the oil must not exceed 16/13 from the ISO standard 4406.
- The acceptable temperature range is –40°F to 200°F.

3. MAINTENANCE

- Grease regularly the trunnion pins. The lubrication period depends on the use of the cylinder. Improper lubrication will result into rapid shaft wear.
- Do not paint the chromed areas of the sleeves.

4. STORAGE

- For the period of non-activity, the cylinder must be stored in its retracted position to prevent critical surfaces from damage.
- Always store the cylinder inside to protect it against harsh atmospheric conditions.
- Fill up the cylinder with oil in order to avoid internal corrosion caused by air condensation. Tilt the cylinder in order to make sure that all seals are completely in contact with the oil to avoid any premature deterioration of the seals. The unit is shipped full of oil.
- Cover any unpainted part with a rust inhibitor to avoid corrosion. We recommend the product RPC no.1 from LUBRILAB (conform to MIL-C-83933A) or equivalent.

5. CYLINDER DISASSEMBLY

5.1. GENERAL CONSIDERATIONS BEFORE DISMANTLING A CYLINDER

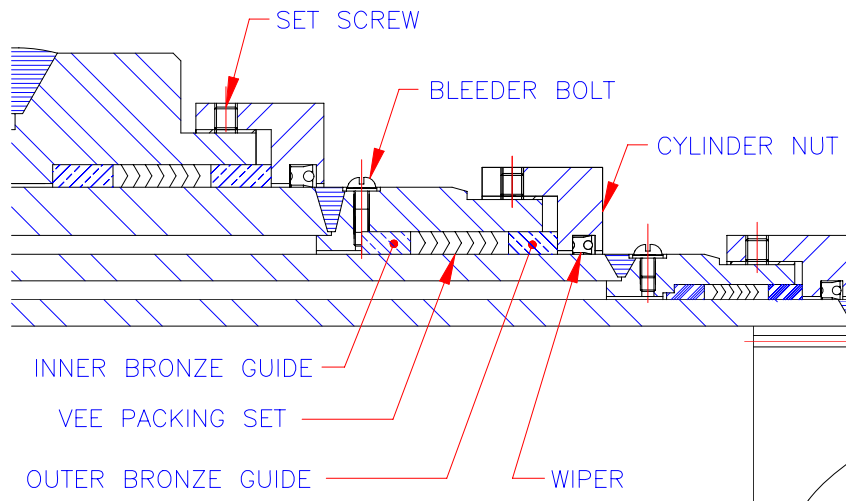
- Dismantle the cylinder in a clean location.
- Each part should be thoroughly cleaned. If the cylinder is to be dismantled for any length of time, coat the metal parts, which are to be reused with good rust inhibitor and store them in a protected area.

5.2. DISASSEMBLY PROCEDURES

- Put the cylinder in its retracted position.
- Shut off the oil pressure in the cylinder.
- Remove the cylinder from the rig.
- Slowly unscrew the plunger bleeder bolt (item 49) and the Sae-6 plug (item 44) from the extend purge port to release the oil pressure inside the cylinder. It is not necessary to remove completely the bleeder bolt or the plug. If their seals do not touch the plunger, the pressure will be released slowly. It can be dangerous to remove the plug when there is still some pressure in the unit.
- Drain the oil out of the unit by removing the plugs (items 44). Handle the cylinder by the lift eyes, and keep it at angle with the ports at the lower end. Collect the oil in a drain pan. Put the unit horizontally for the following procedures.
- Put the master cylinder on a floor area accessible to a mobile crane or other lifting device. Fix the cylinder solidly to a structure so it will not move while disassembling.
- Unscrew the (4) socket set screws (item 35) locking the cylinder nuts.

- Locate spanner wrench in drilled holes of cylinder nuts (items 36-37-38-39) or use a chain wrench and rotate counter-clockwise to unscrew .
- Remove the outer guide out of the assembly. (Fig. 1)

FIG. 1



- Remove the Vee packing (item 34) by pulling on the sleeve. If it remains inside the cylinder try the following procedures. Pull on the sleeve to extend the cylinder approximately 6 inches. Clean the sleeve and cover the area close to the master tube with 3 turns of masking tape. Each layer overlaps the previous one on half its width. Push the sleeve inside the tube. The tape increases the friction on the seal. Pull on the sleeve to remove the Vee packing.
- Remove the inner guide out of the assembly. The previous procedure can be used for this purpose.
- Repeat the procedures to remove the guides and the Vee packings on the other sleeves

-
- To remove the sleeves from the master cylinder, unscrew the socket head cap screws (item 7) and remove the end cap (item 6).
 - To remove smaller sleeves, push out the spring pins (items 10-26) and unscrew the stopper nuts (items 11-12-13).
 - Whenever a cylinder is disassembled, all seals, wipers and nylon guides should be changed before re-assembling. Change also the guides (items 22-23-24-25) on the pistons.

6. SEALS CHANGE REQUIREMENTS

- Installation tools should be of soft metal, suitable plastic, free of burrs, sharp edges, etc. Screwdrivers and similar tools should not be used as they may damage the sealing edges.
- The grooves and all metal areas in contact with the seals should be free of burrs, sharp edges and nicks.
- Protective devices should be used whenever the seal is forced over sharp edges, slots, and undercuts.
- The seals and installation grooves should be lightly lubricated before installation, using the same oil as used in the cylinder. For field maintenance operation, draw it from the filtered supply (this will ensure that seal-fluid compatibility is respected). Grease is recommended only for Vee packing. We use Sinto Racing multi purpose grease Sin 250 .

7. CYLINDER ASSEMBLY

7.1. PROCEDURES

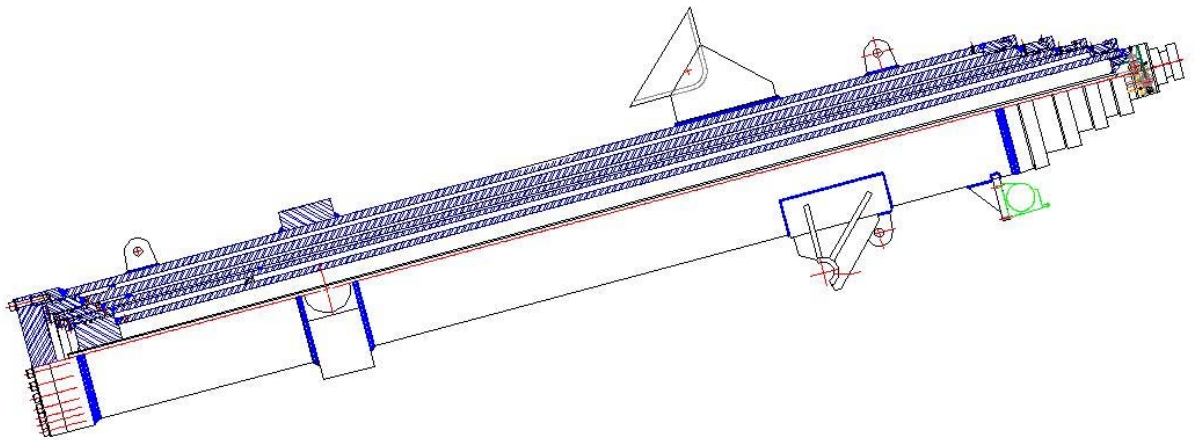
- Clean the inner and the outer parts of the sleeves with a grease remover. (Ex.: Sapsol from Safety Kleen Inc.) Clean also the other parts.
- Put the master cylinder horizontally on a floor area accessible to a mobile crane or other lifting device. Fix the cylinder solidly to a structure so it will not move during the assembly.
- Install the piston guides (items 22-23-24-25) in their groove. No special tool is required. Extend slightly their diameter while it pass over the larger diameter of the sleeves.
- Install the piston rings (items 14-21) for the smaller diameter sleeve. The use of a thin mandrel to slide the seal over the

internal threads would ease the installation, but it can be done without it.

- You can use a mobile crane to lift the sleeves. Do not use chain to hoist the tube since it can damage the surface. Use a strap instead. Slide the plunger (item 5) into the second sleeve. Press on the guides and on the piston rings when they are close to the master tube opening. This will ease the insertion and prevent from damaging the components. Make sure not to damage the internal and external surfaces of the tubes. Always lubricate before inserting a sleeve.
- Screw in the stopper nut and lock with a spring pin.
- Slide in the inner guide.
- The Vee packing set is made of many layers of V shape seals. Note the position of each one in the kit. It is important to install them in the same order. Lubricate the seals. Make sure that the lips face the inside of the cylinder. (Fig. 1) Push each layer separately between the sleeves using a plastic stick. (1/2" x 3/16" x 8" long)
- Slide in the outer guide.
- Install the bleeder screw (items 49-50)
- Repeat the same steps with the larger sleeves.
- Install the wipers (items 40-41-42-43) in their groove, on the cylinder nuts.
- Grease the cover threads and install them starting with the largest one.
- Tighten the cover using a spanner wrench or a chain wrench. Refer to section 6.3 for cover adjustment.
- Put a nylon insert (1/4" diameter x 1/8" long) in the set screw hole in the cylinder nut. Lock the cover with a set screw (item 35). The nylon insert is necessary to protect the threads. It can be cut from a 1/4" section o-ring.

7.2. BLEEDING PROCEDURE

- The purpose of the procedure is to evacuate all the air that could be trapped inside the cylinder prior to put it in service.
- It is important to wear safety goggles during the process considering the fluid pressure involved.
- The cylinder must be positioned at an angle of about 15° to 20° in order to direct the air through the bleeders on each stage.
- Make sure that both ports are properly connected (extend and retract) while attempting to stroke the cylinder. Inappropriate connection could result into important damage to the cylinder while extending.



- All bleeders must be oriented face up on all stages
- Open all bleeders. Using the power unit, begin to fill in the cylinder with oil by the retract port with the cylinder in retracted position.
- Air will come out by the bleeder holes while filling in. The oil will then flow through the bleeding holes. Close the bleeders accordingly until they are all closed.
- Extend the cylinder by 2 or 3 feet and retract. Repeat few times (3 to 4 times). The cylinder should stroke smoothly with no “jogging”. If it is not the case, repeat the bleeding procedure.

7.3. PROOF TESTING

- After a cylinder has been completely assembled, bleed it following the Hyco bleeding procedure (see 6.2). Then, test it at low pressure in order to be sure that the sleeves are moving freely and are not scored. Afterward, increase the pressure to the maximum recommended value and check for leakage. If the cylinder is leaking externally, tighten the cylinder nut until the leaking stops. Internal bypass is checked while the cylinder is fully retracted or extended, no internal bypass is permitted for this cylinder.

7.4. COVER ADJUSTMENT

- Make sure that there is no more pressure in the cylinder. It is not possible to adjust the covers while the cylinder is pressurised.
- Unlock the cylinder nuts by unscrewing the set screws .
- Tighten cylinder nuts from the largest to the smallest. Tighten strongly or until the sections rotate. Use a twelve-foot extension on the wrench to act as a lever. It is not normal that you reach the end of the thread length, if so contact one of our representatives.
- Finish by locking the cylinder nuts, tightening the set screws.
- Run the cylinder a few cycles. If leaks are detected, repeat the steps until they are eliminated.

8. ASSISTANCE

If you need any assistance, feel free to contact one of our Sales representatives at:

TEL. (819) 224-4000

FAX (819) 224-4224