SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

CLINCHER®
HYDRAULIC ROTARY TABLES

Covers Rotary Table Models
HRT-20B & HRT-20C

4225 Highway 90, East
Broussard, Louisiana 70518
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This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the CLINCHER® Rotary Tables HRT20-B & HRT20-C, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile.

Name: ______________________________
Company: ______________________________
Address: ______________________________
Address: ______________________________
City: ______________ **State:** ______________
Postal Code: ______________ **Country:** ______________
Telephone: ______________ **Fax:** ______________

RT Model No.: ______________ **Serial No.:** ______________
Assembly Date: ______________

- -

CLINCHER® Rotary Tables HRT-20B & HRT-20C Technical Manual
Registration Form

Name: ______________________________
Company: ______________________________
Address: ______________________________
Address: ______________________________
City: ______________ **State:** ______________
Postal Code: ______________ **Country:** ______________
Telephone: ______________ **Fax:** ______________

RT Model No.: ______________ **Serial No.:** ______________
Assembly Date: ______________

Return To:

SUPERIOR Mfg. & Hyd.
4225 Hwy. 90 East
Broussard, LA 70518
USA

Telephone: 337-837-8847
Facsimile: 337-837-8839
Web Site: www.superior-manf.com

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HRT-20B & HRT-20C CLINCHER® Rotary Tables

REVISION TABLE			
Section	***Page***	***Date***	***Description***

CLINCHER® HYDRAULIC ROTARY TABLES
HRT-20B & HRT-20C

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.
Note	concerns an operating procedure or practice that needs highlighting.

CLINCHER® Rotary Tables are manufactured to provide a means to rotate drill pipe under high torque conditions. They utilize high pressure hydraulic fluid power which can cause the rotary table to move suddenly and with great force if the rotary table is not properly rigged up and operated. **CLINCHER®** Rotary Tables contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Rotary Tables are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the rotary table is connected to any hydraulic power unit.**

CLINCHER® Rotary Tables weigh 4100 lbs. **WARNING: Users must insure the entire suspension system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are capable of handling the static weight of the rotary table PLUS any shock loads which may be seen during operation.**

WARNING: Users must provide a means of safely controlling the rotary table movements in all directions when it is in use. Failure to account for its size, weight, movement and the amount of torque developed could result in personnel injury or death.

CLINCHER® Rotary Tables utilize high pressure hydraulic fluids. Portions of the rotary table, control valves, hydraulic lines may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns.

CLINCHER® HYDRAULIC ROTARY TABLES
HRT-20B & HRT-20C

HAZARD WARNING

WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.

No attempt should be made to operate the **CLINCHER®** Rotary Table for any purpose other than which it is intended. This system is capable of generating very large torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the rotary table, or could possibly result in injury or death of personnel.

Operators are cautioned to practice soft startups and stops to avoid unnecessary shock loads on mechanical equipment and the hydraulic system. Extreme care must be taken when releasing torsion stored within a string of pipe. The sudden release of hydraulic pressure will allow stored torque to drive the rotary in the opposite direction in an extreme fashion.

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

DESCRIPTION, FEATURES, & SPECIFICATIONS

DESCRIPTION AND APPLICATION

The **CLINCHER®** Models HRT-20B & HRT-20C Hydraulic Rotary Tables are designed to add high speed, high torque rotational capacity to snubbing units. This unit is mounted above the snubbing unit's hydraulic cylinders. A pneumatic or hydraulically actuated slip assembly *(supplied by others)* can be bolted to the rotary's top mounting flange to accommodate both pipe pulling (tension) and pipe snubbing (compression) operations.

HRT-20C differs from HRT-20B in that it features a roller type thrust bearing instead of a thrust bushing. This bearing provides enhanced performance in applications where pipe must be "snubbed" into the well while rotating for extended periods of time. Such applications may include shallow drilling, milling, window cutting, and side tracking.

FEATURES AND BENEFITS

The Rotary Table's large bore design (11.06 inch minimum ID) will readily allow the passage of large downhole tools. This feature significantly reduces tripping times when compared to other systems which must be removed when large diameter tools such as mills, packers, or side pocket mandrels are encountered.

Four single speed hydraulic motors with one piece shafts directly drive the Rotary Table to provide high torque capacity in a compact package. High efficiency Rineer GA-15 vane type motors are powered by the snubbing unit's hydraulic power supply to eliminate the need for additional power units. Precise speed, direction, and torque control are achieved by means of pilot operated control valves *(supplied separately)*. *Note:* A two speed motor option is available. Motors are interconnected by welded supply and return manifolds with split flange o-ring connections to provide optimum reliability in service.

Tensile loads (pulling pipe) are carried by a lubricated roller bearing. In the HRT-20B, compressive loads (snubbing pipe) are transferred through a composite self lubricating thrust bearing assembly. In the HRT-20C, compressive loads (snubbing pipe) are transferred through a lubricated roller bearing. For extreme drilling applications, long term heavy compressive loads will be encountered with simultaneous high speed rotation. Lubricated bronze bushings absorb any radial loads resulting from eccentric slip assembly loading. The enclosed gear train and bearings are lubricated and cooled by hydraulic fluid used to drive the motors.

A high pressure hydraulic swivel system is incorporated within the rotary to allow remote control of the slips without the need for disconnecting or reconnecting hydraulic hoses. The swivel contains a fresh water heat exchanger to avoid heat buildup and potential seal damage during periods of extended rotation.

DESCRIPTION, FEATURES, & SPECIFICATIONS

SPECIFICATIONS

Minimum Internal Diameter	11.06 inches
Maximum External Diameter of Mounting Flange	34.00 inches
Maximum Manifold Diameter	35.70 inches
Overall Height / HRT-20B HRT-20C	39.00 inches 42.75 inches
Approximate Weight / HRT-20B HRT-20C	3,500 pounds 4,100 pounds
Maximum Tensile Capacity	460,000 pounds
Maximum Compressive Capacity	170,000 pounds

HYDRAULIC MOTOR SPECIFICATIONS

Number of Motors	4
Manufacturer / Model	Rineer GA-15
Displacement (per/motor)	15 in3 / Revolution
Maximum Torque (per/motor) @ 3000 psi	560 ft.lbs.
Maximum Continuous Motor Speed	1500 rpm
Maximum Intermittent Motor Speed [1]	2000 rpm
Maximum Continuous Motor Pressure	3000 psi
Maximum Intermittent Motor Pressure [1]	3500 psi
[1] Intermittent condition 10% of every minute.	

Rotary Table Gear Reduction	9.923:1
Continuous Torque Rating @ 2,500 psi	18,000 ft.lbs.
Maximum Torque Developed (@ 3,000 psi)	22,000 ft.lbs.
Pressure Required to Develop 15,000 ft.lbs.	2,032 psi

DESCRIPTION, FEATURES, & SPECIFICATIONS

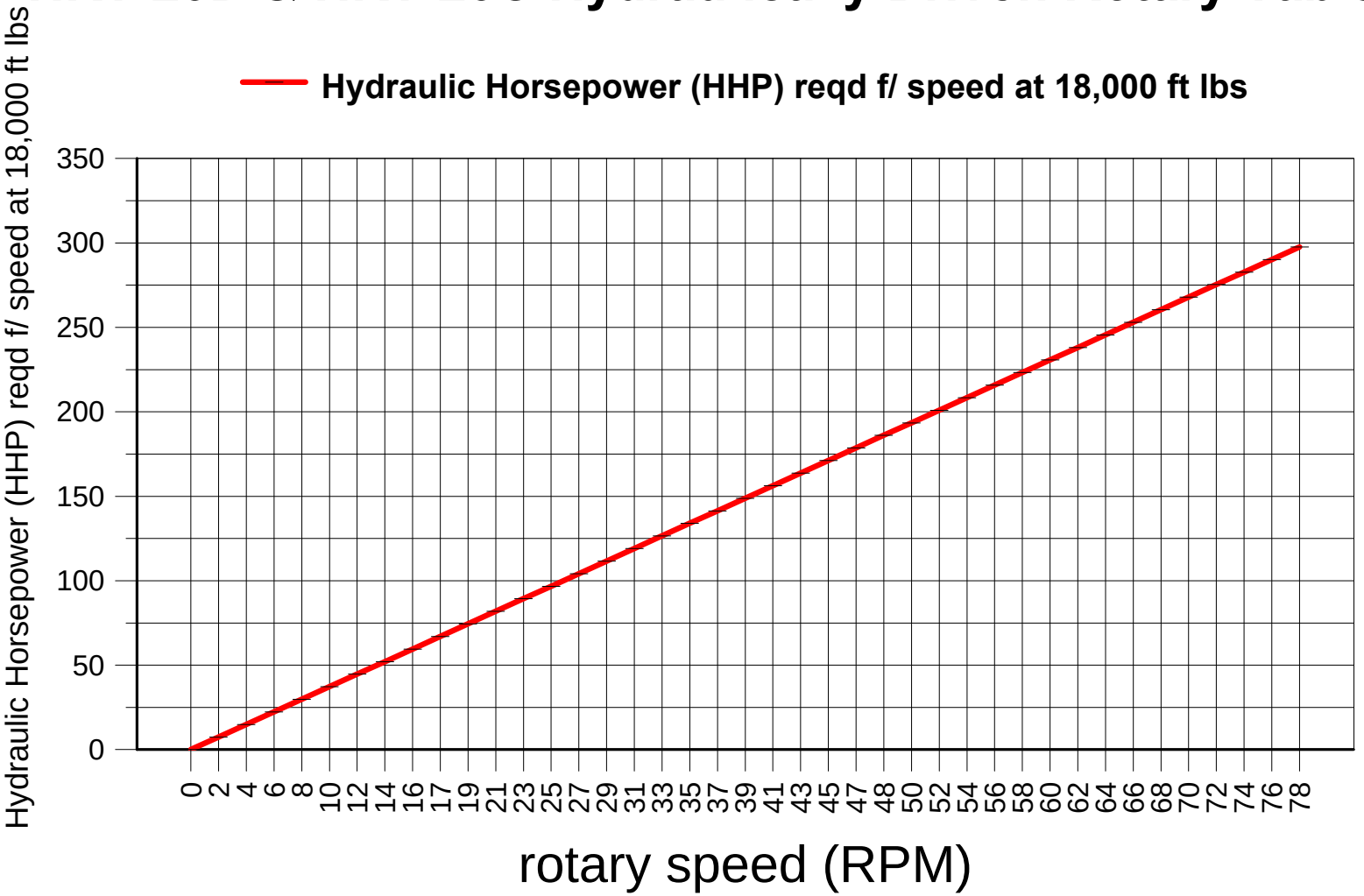
SPECIFICATIONS

Rotational Speed @ 120 gpm	47 rpm
Rotational Speed @ 155 gpm	60 rpm
Maximum Recommended Flow Rate	200 gpm
Supply & Return Manifold Connections	2" NPT (Sch 160)
Maximum Allowable Flow Rate [2]	392 gpm
Maximum Allowable Rotational Speed [2]	152 rpm
[2] Manifold modifications are required for flow rates above 209 gpm.	
Maximum Swivel Hydraulic Pressure	1,500 psi
Swivel Hydraulic Connections	3/8" NPT
Top Plate Connections to Slips	3/8" NPT
Maximum Swivel Coolant Pressure	60 psi
Recommended Fresh Water Coolant Flow Rate	5-10 gpm
Swivel Coolant Connections	3/8" NPT

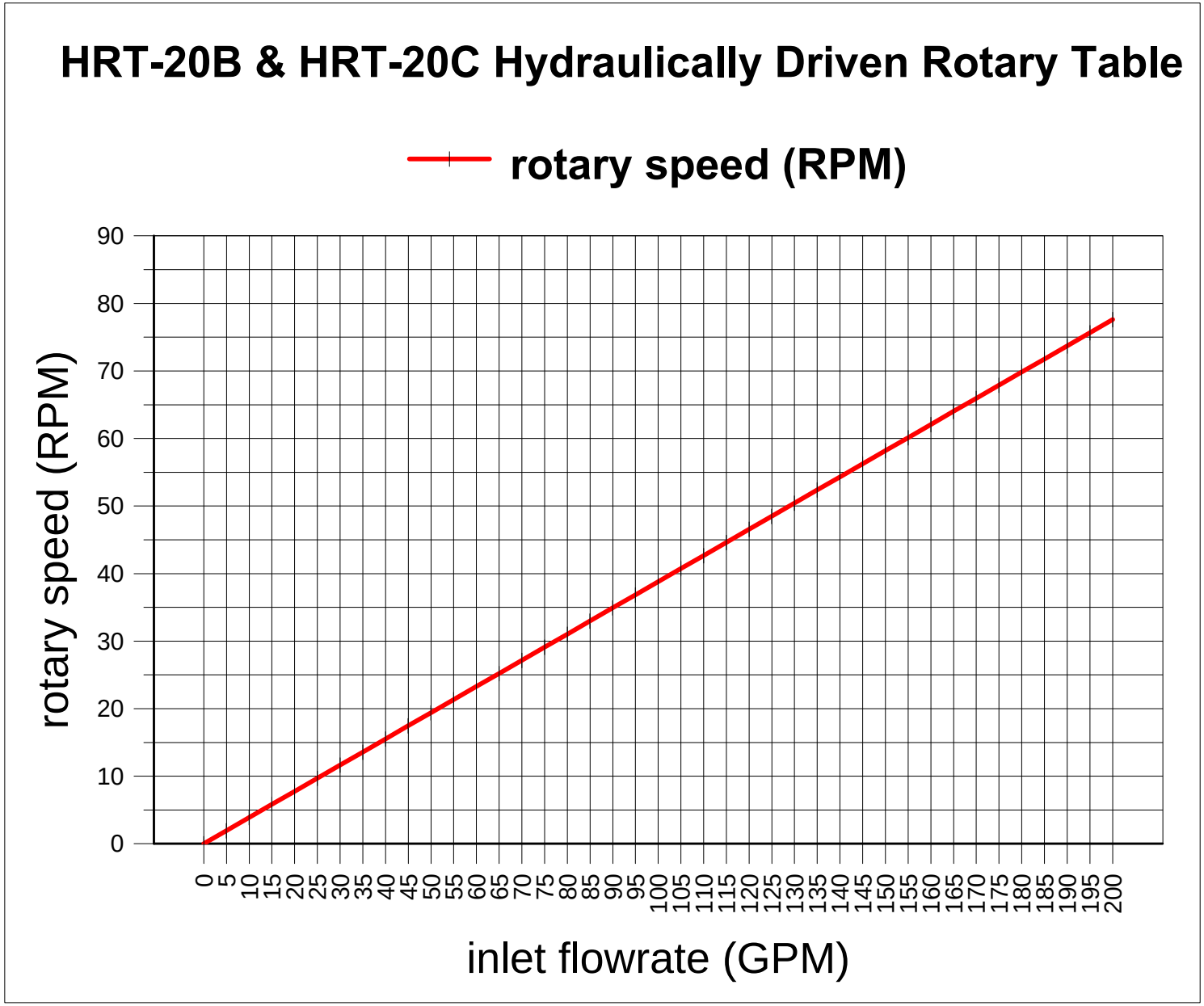
GENERAL INFORMATION

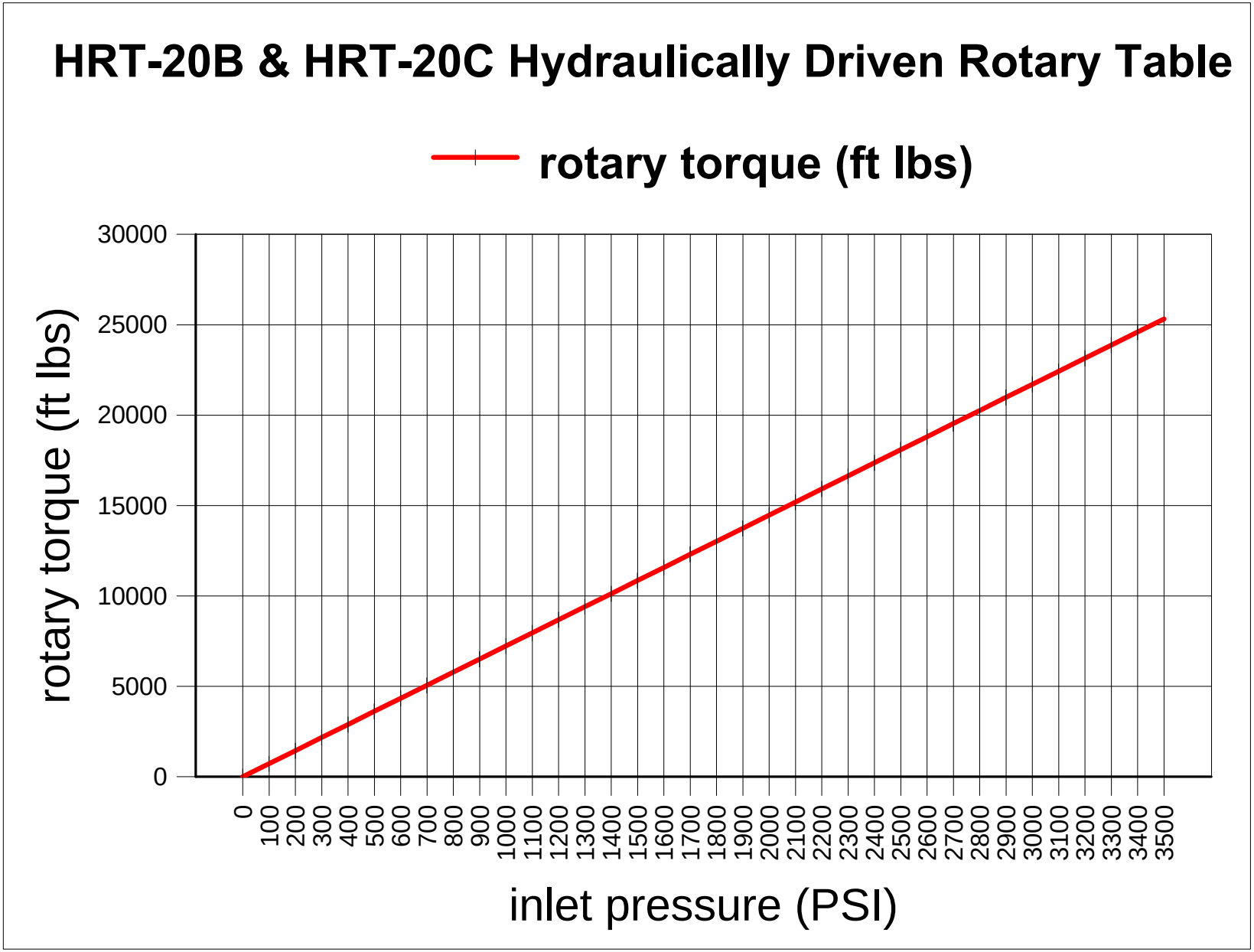
The HRT-20B and HRT-20C Hydraulic Rotary Tables feature an increased tensile load rating from 340,000 to 460,000 pounds when compared to earlier units. This upgrade is achieved by eliminating the small slip assembly mounting bolt hole pattern and increasing the thickness of the top mounting flange *(ref Item 1)* from 2" to 4". This unit features face seal o-rings between hub *(ref Item 9)* and the top mounting flange. Ports for slip system control hydraulics are integral to the top mounting flange to eliminate potential leak points.

HRT-20B & HRT-20C Hydraulically Driven Rotary Table



HHP = Pressure (psi) x flowrate (gpm) / 1714


HRT-20B & HRT-20C Hydraulically Driven Rotary Table
rotary speed (RPM)
rotary speed (RPM)
0
10
20
30
40
50
60
70
80
90
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200
inlet flowrate (GPM)


HRT-20B & HRT-20C Hydraulically Driven Rotary Table
rotary torque (ft lbs)
rotary torque (ft lbs)
30000
25000
20000
15000
10000
5000
0
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
inlet pressure (PSI)

DESCRIPTION, FEATURES, & SPECIFICATIONS

Photo 1

SUPERIOR MANUFACTURING & HYDRAULICS

Hydraulically Driven Rotary Table

OPERATING INSTRUCTIONS

User should be advised the continuous operating conditions should not exceed the continuous torque rating of 18,000 foot pounds or maximum recommended flow rate of 200 gpm. Maximum tensile or compressive ratings must not be exceeded. The Rotary Table should be removed from the snubbing unit if extended jarring operations are expected. Do not operate this equipment outside of these ratings. Failure to comply with these limits could result in premature equipment failure, and expose personnel to potential injury or death.

Note: This unit uses a small amount of hydraulic oil which bypasses from the motors during operation to cool and lubricate the gears and bearings. *Note:* In early manufactured Rotary Tables these motors were not equipped with motor seals. Do not install seals during repair or maintenance operations. ***Note:*** Later manufactured Rotary Tables are equipped with motor seals. In these units, case drains must be connected to each motor to allow motor case pressure to be bled off directly to the hydraulic reservoir by means of an independent drain hose.

After rigging up the Rotary Table on the snubbing unit and before beginning rotation, the users must insure the case is filled with clean hydraulic oil. *Note:* Approximately 6 gallons of oil are required to fully fill case. The HRT-20C Rotary Table uses approximately 7 1/2 gallons of SAE 90 weight gear oil in the case to lubricate and cool the bearings and gear train. Now our units do not require a gear case return hose. Fill using the following procedures shown below:

All Rotary Tables have 3/4" NPT ports located on the flange of the upper housing. On the latest units, one port is stamped “RETURN” and is equipped with a dip tube *(ref Item 38)* to enhance oil circulation. The port 180 degrees from the case drain “RETURN” port is stamped “VENT”. Fill the case by removing the plugs in the “RETURN” and “VENT” ports. Use an elongated funnel to direct hydraulic oil into the case through the “RETURN” port unit until oil is visible in

Earlier units also have 3/4" NPT ports located on the flange of the upper housing but these ports are not stamped “RETURN” and “VENT”. These units may be filled from either port. In these earlier units, the upper sight glass *(ref Item 50)* must be removed to allow air to escape from the case during filling operations. Use an elongated funnel to direct hydraulic oil into the case unit until oil is visible in upper sight glass port. Reinstall sight glass in upper port.

A case drain line must be run from the hydraulic power unit’s reservoir to the 3/4" NPT ports *(ref Detail A, Assembly Dwg’s)* in the upper housing. On newer units connect this line to the port labeled “RETURN”. The line may be connected to either port on earlier units which are not labeled. The case drain line must loop over the manifolds to insure the case remains full of fluid during operation. **It is vital that the case drain line be free of restrictions and back pressure. Otherwise excessive case pressure may cause seal leaks, excess heat buildup, or extreme conditions, actual failure of the housing due to excessive internal pressure.**

OPERATING INSTRUCTIONS

Use a high pressure grease gun with extended nozzle to inject Texaco Marfax grease or equivalent into the two grease zerts *(ref Item 7)* located in the upper housing. Inject grease until grease escapes between hub *(ref Item 9)* and upper seal retainer *(ref Item 5)*. **After initial injection of grease, we recommend these ports be re-lubricated after every four (4) hours of rotation.**

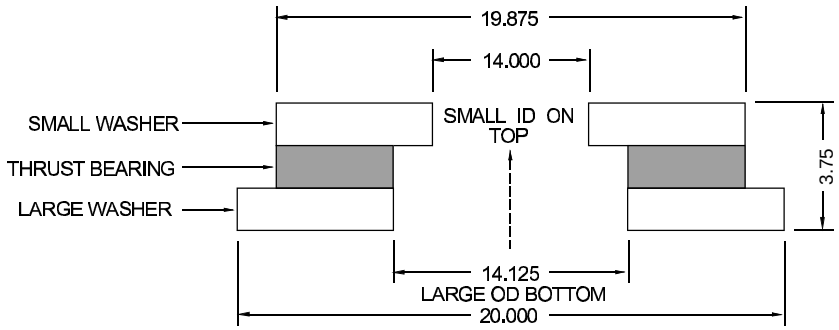
Connect hydraulic swivel coolant connections to a regulated supply of fresh water. When temperatures are 32° F or less, water in rotary swivel should be replaced with coolant (Anti-Freeze). Use Teflon based thread compound to seal connections, care must be taken to avoid over tightening or damaging the 3/8" NPT connections in the aluminum swivel housing. Use of brackish or salt water may result in corrosion of the swivel. Note the inlet pressure should not exceed 60 psi. Users may have to install a pressure regulator to avoid over pressuring the swivel. A filter may also be required to insure heat exchanger does not become clogged with foreign debris. Coolant exhaust or return line back pressure should not exceed 5 psi.

Connect hydraulic swivel slip control lines to slip control valve. Use Teflon based thread compound to seal connections, care must be taken to avoid over tightening or damaging the 3/8" NPT connections in the aluminum swivel housing. Maximum hydraulic pressure to operate slips should not exceed 1,500 psi. All pressure must be drained from the swivel and slip control circuit before rotating. Failure to abide by this guideline will result in excessive heat buildup, wear of hub surface, and premature seal failure. Superior recommends the slip circuit be controlled by means of a directional control valve with float center (connected to tank line). A pilot operated check valve or counter balance valve may be incorporated within the slip assembly if the user desires to trap pressure within the slip's cylinders while rotating. *Note:* If hydraulic system has high back pressure in the return circuit, a separate return line may be desirable to maximize seal life.

A rotational locking pin assembly *(ref Item's 32, 33, 34, & 35)* is provided to lock the hub and top mounting flange when installing the slip assembly or when tripping pipe. It is not designed to prevent rotation caused by pressurizing the hydraulic motors. Applying high pressure to the motors when the locking pin assembly is engaged may cause equipment damage or could result in sudden unexpected movement.

Operators are cautioned to practice soft startups and stops to avoid unnecessary shock loads on mechanical equipment and the hydraulic system. Extreme care must be taken when releasing torsion stored within a string of pipe. The sudden release of hydraulic pressure will allow stored torque to drive the rotary in the opposite direction in an extreme fashion.

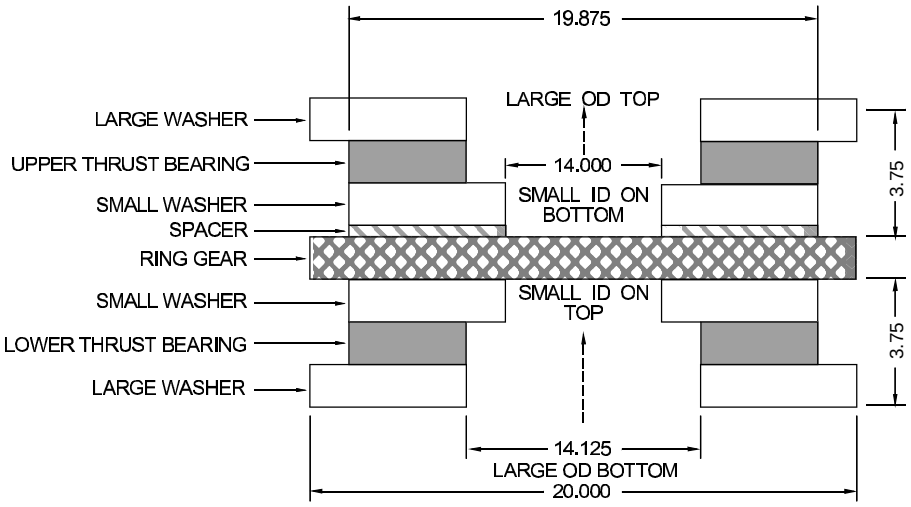
MODEL HRT-20B
THRUST BEARING
P/N: 140TP158
ITEM 16



INSTALLATION INSTRUCTIONS FOR THRUST BEARING

- INSTALL SMALL WASHER TOP.
- INSTALL LARGE WASHER BOTTOM.

MODEL HRT-20C
THRUST BEARING
P/N: 140TP158
ITEM 16



INSTALLATION INSTRUCTIONS FOR THRUST BEARING

- INSTALL LARGE WASHER TOP.
- INSTALL SMALL WASHER BOTTOM.

THRUST BEARING INSTALLATION

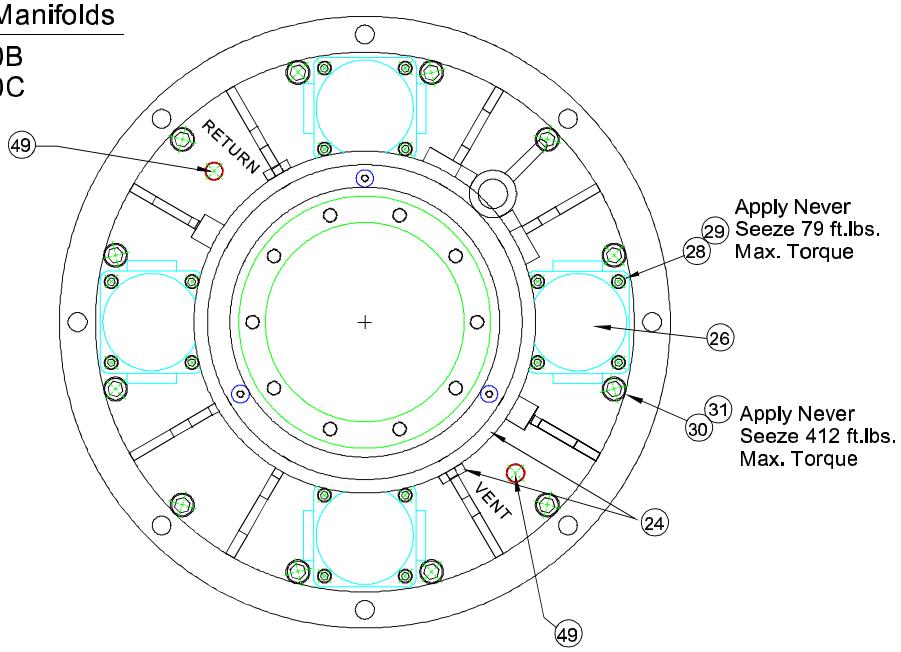
SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

		11/15/00
REV. #	LOG #	DATE

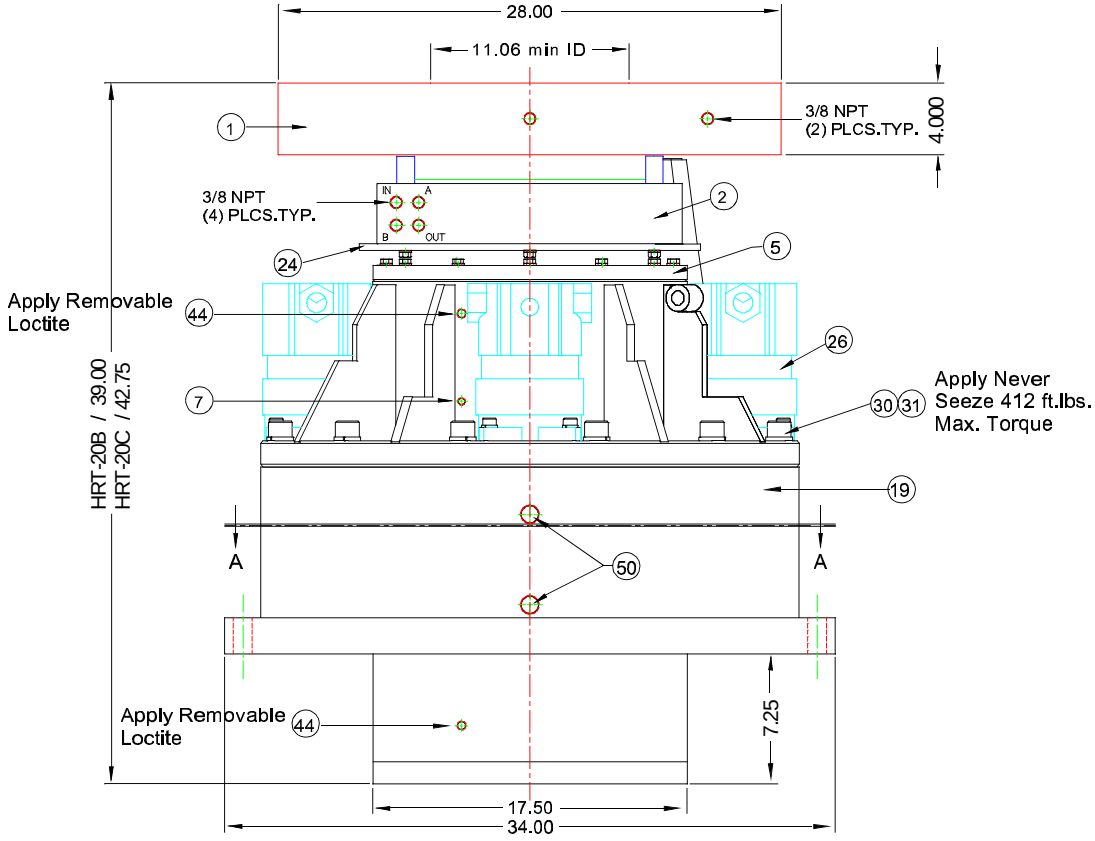
REF: S:\Equip Manuals\Dwgs\Rotary Tbls\Thrust Brg Install.wpg

Approx. Weight w/ Manifolds

3,500 lbs. / HRT-20B
4,100 lbs. / HRT-20C



TOP VIEW
(SHOWN W/O TOP MOUNTING FLANGE AND MANIFOLDS)



FRONT VIEW
(SHOWN W/O MANIFOLD ASSY. ø 35.75 O.D.)

HRT-20B & HRT-20C HYDRAULIC ROTARY TABLE

RT1000 SHT 1 OF 6

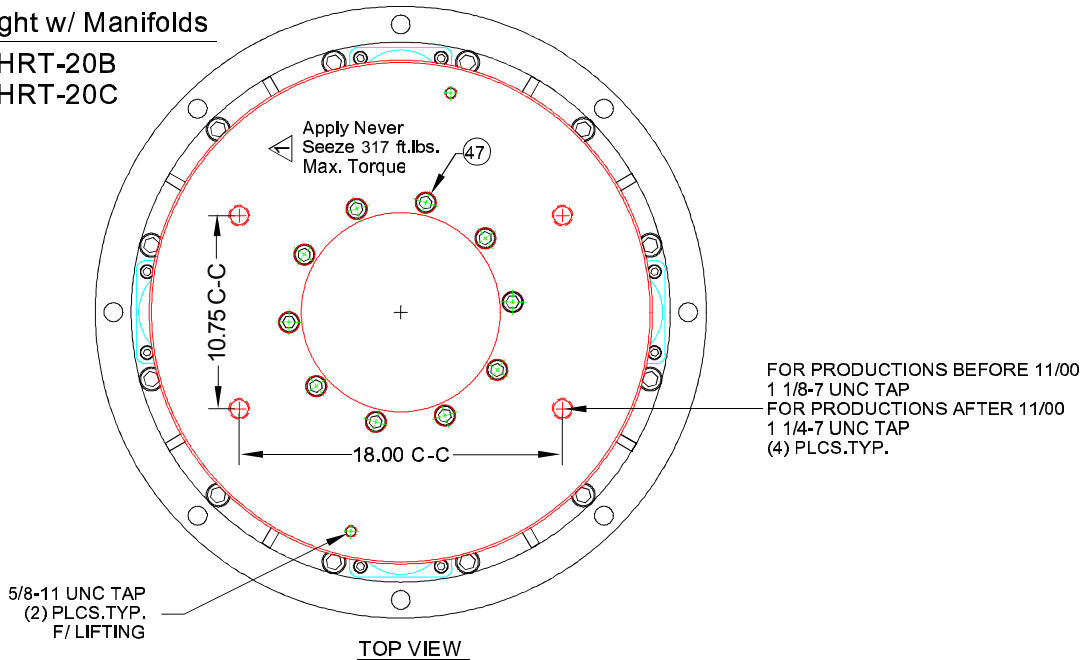
SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

		11/14/00
REV. #	LOG #	DATE

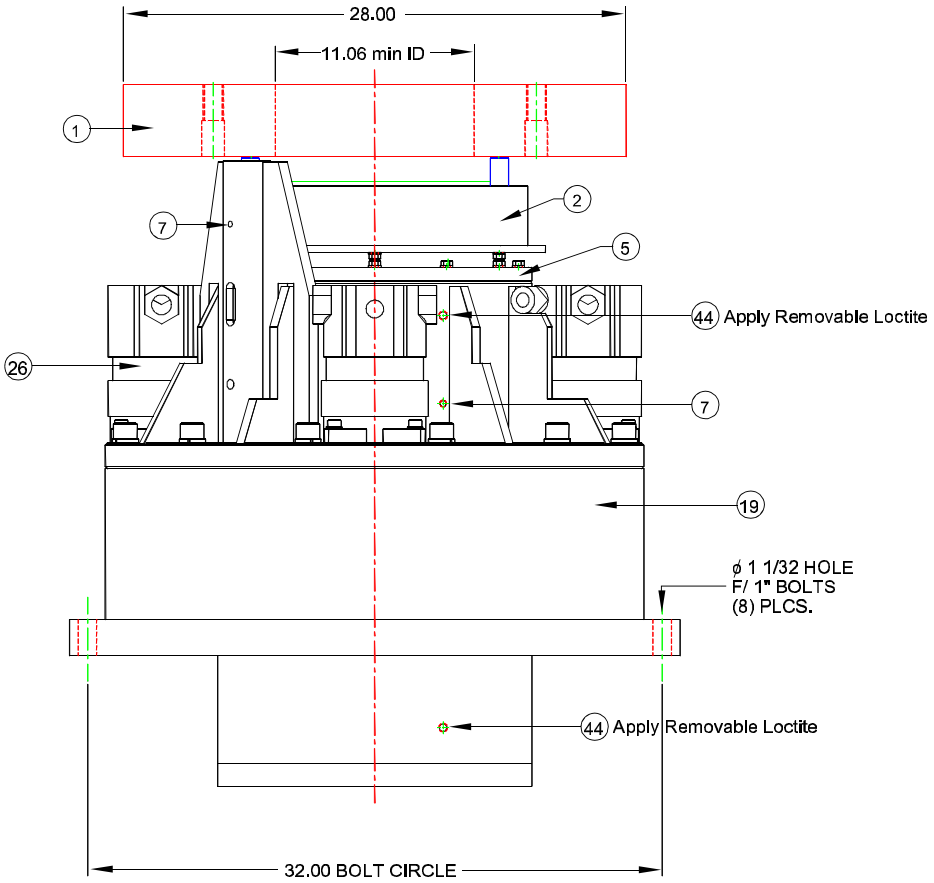
REF: S:\Equip Manuals\Dwgs\Rotary Tbls\RT1000 sh1 of 6.wpg

Approx. Weight w/ Manifolds

3,500 lbs. / HRT-20B
4,100 lbs. / HRT-20C



TOP VIEW
(SHOWN W/O MANIFOLDS)



REAR VIEW
(SHOWN W/O MANIFOLD ASSY.)

HRT-20B & HRT-20C
HYDRAULIC ROTARY TABLE

RT1000 SHT 2 OF 6

SUPERIOR Manufacturing & Hydraulics
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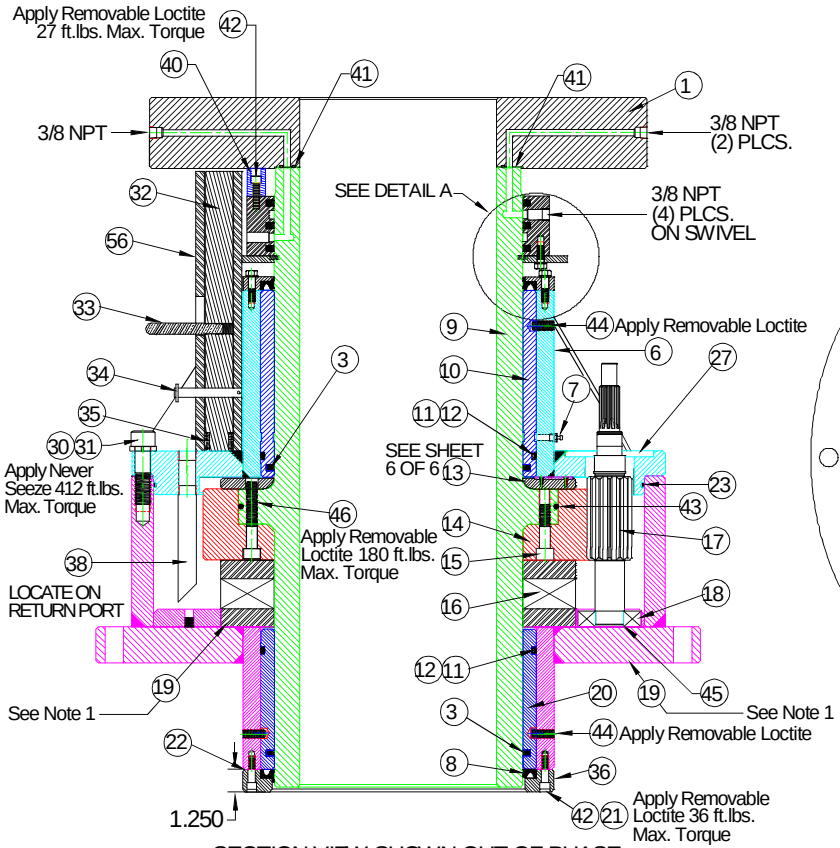
BROUSSARD, LA 70518
(318) 837-8847

REV. #	LOG #	DATE
		11/14/00

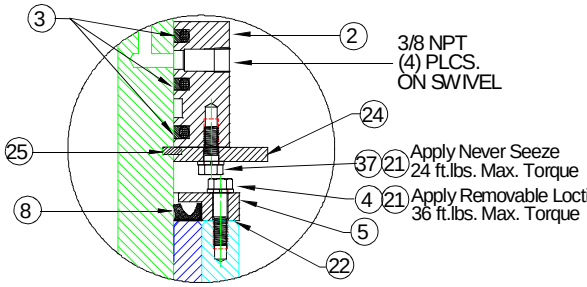
REF: S:\Equip Manuals\Dwgs\Rotary Tbls\RT1000 sh2 of 6.wpg

Approx. Weight w/ Manifolds
3,500 lbs.

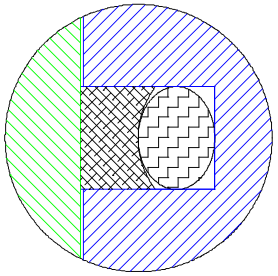
NOTE 1: LOWER HOUSING WELDMENT / P/N: RT1001
INCLUDES:
RT1001-S1 / BOTTOM BEARING HOUSING
RT1001-S3 / TOP MOUNTING PLATE
RT1001-S5 / BEARING RETAINER
RT1001-S6 / BOTTOM MOUNTING FLANGE



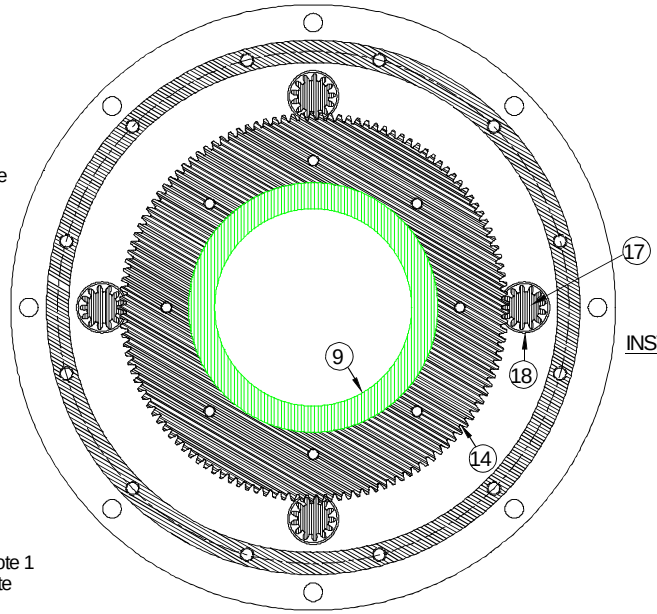
SECTION VIEW SHOWN OUT OF PHASE
(SHOWN W/O MOTORS MANIFOLD ASSY.)
FOR CLARITY PURPOSE



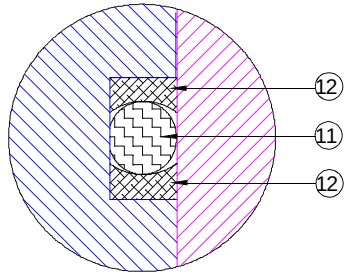
DETAIL A



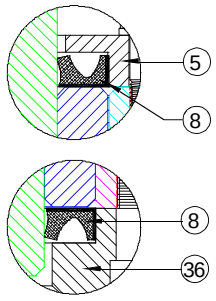
INSTALLATION DETAIL OF ITEM #3



SECTION A-A



INSTALLATION DETAIL OF ITEM #11 & #12



INSTALLATION DETAIL OF ITEM #8

HRT-20B HYDRAULIC ROTARY TABLE

RT1000 SHT 3 OF 6

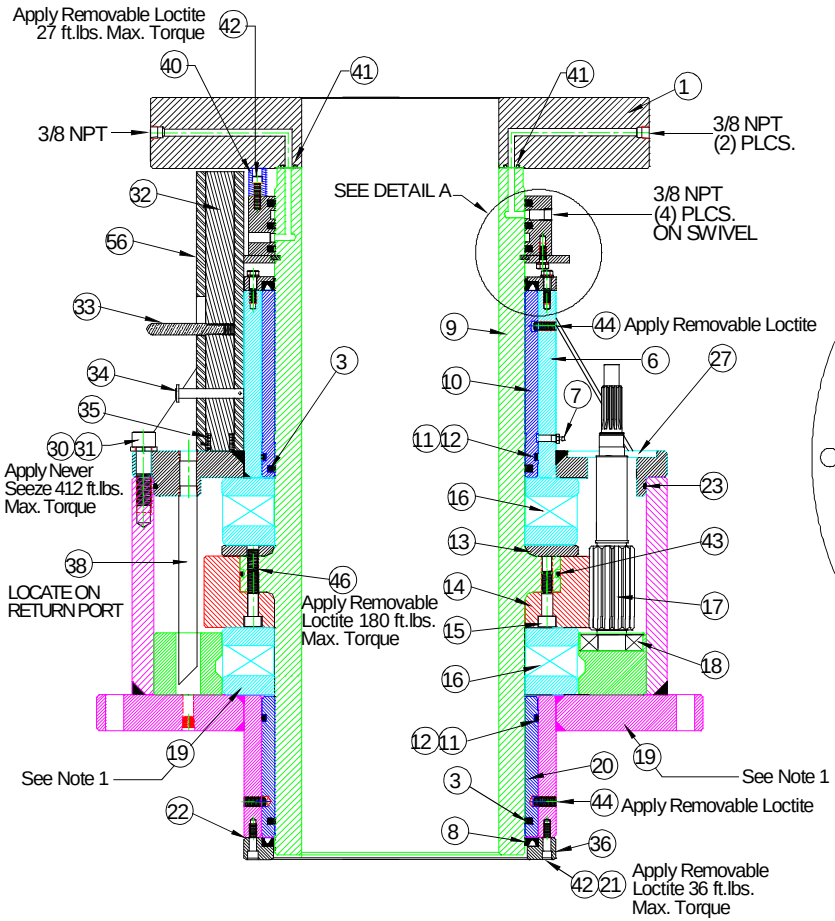
SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

		11/14/00
REV. #	LOG #	DATE

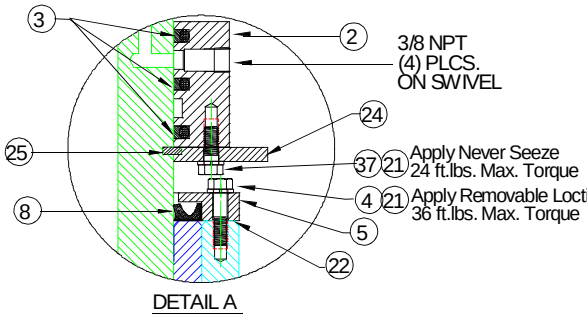
REF: S:\Equip Manuals\Dwgs\Rotary Tbls\RT1000 sh3 of 6.wpg

Approx. Weight w/ Manifolds
4,100 lbs.

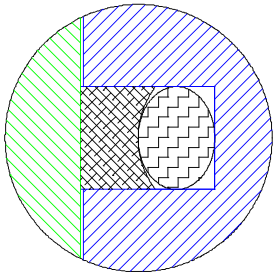
NOTE 1: GEAR HOUSING WELDMENT / P/N: RT1050
INCLUDES:
RT1001-S1 / BOTTOM BEARING HOUSING
RT1001-S6 / BOTTOM MOUNTING FLANGE
RT1001-S7 / GEAR CASE RING
RT1001-S8 / BEARING RETAINER



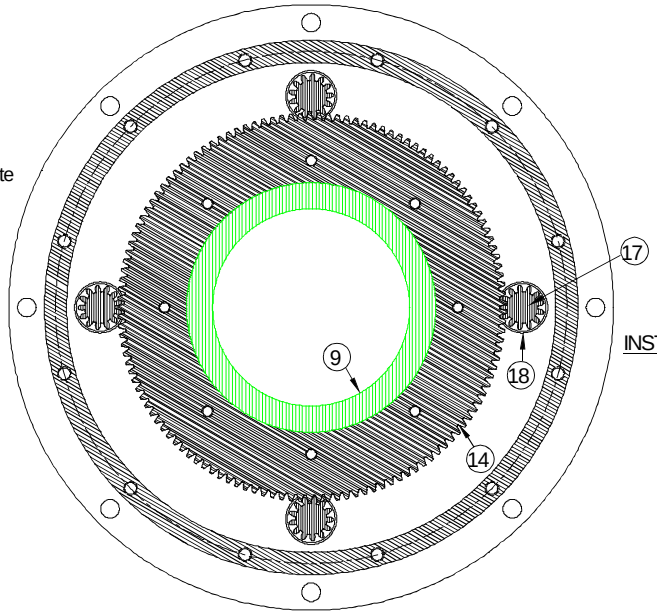
SECTION VIEW SHOWN OUT OF PHASE
(SHOWN W/O MOTORS MANIFOLD ASSY.)
FOR CLARITY PURPOSE



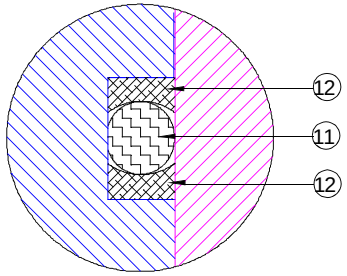
DETAIL A



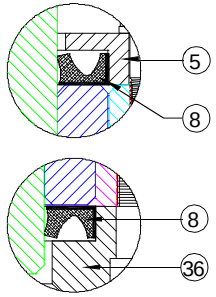
INSTALLATION DETAIL OF ITEM #3



SECTION A-A



INSTALLATION DETAIL OF ITEM #11 & #12



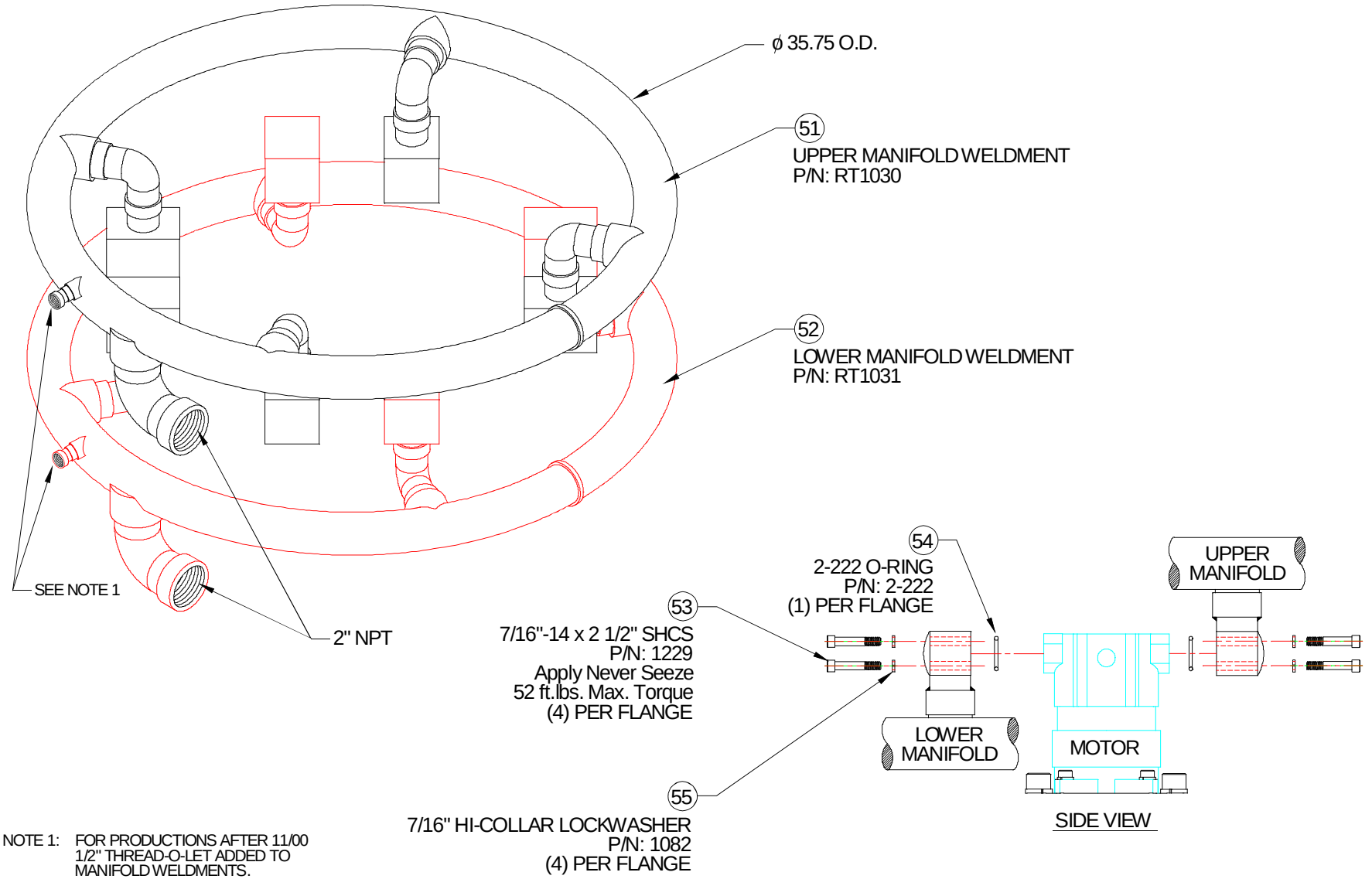
INSTALLATION DETAIL OF ITEM #8

HRT-20C HYDRAULIC ROTARY TABLE

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

		11/14/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\Rotary Tbls\HRT20-C Assy.wpg



NOTE 1: FOR PRODUCTIONS AFTER 11/00 1/2" THREAD-O-LET ADDED TO MANIFOLD WELDMENTS.

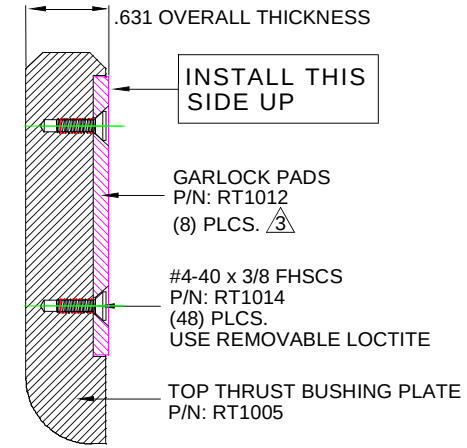
HRT-20B & HRT-20C HYDRAULIC ROTARY TABLE

RT1000 SHT 4 OF 6

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

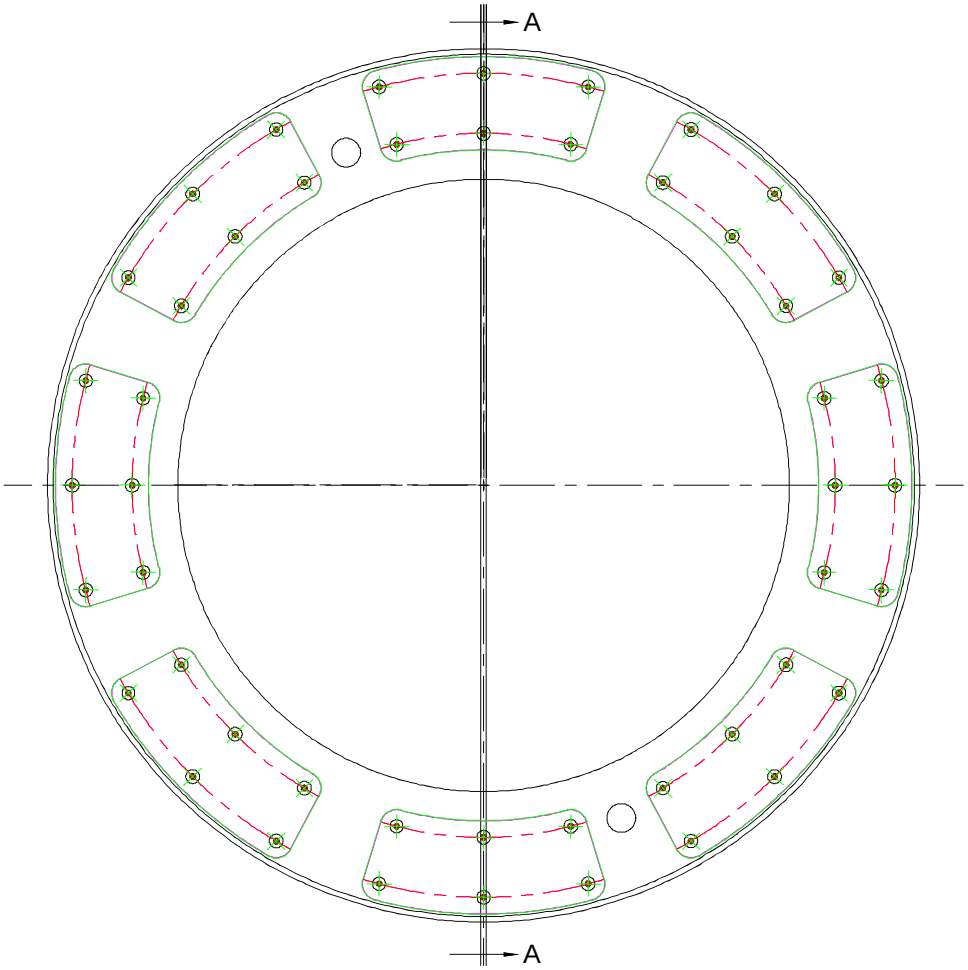
		11/14/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\Rotary Tbls\RT1000 sh4 of 6.wpg



DETAILS

SECTION A - A



TOP VIEW

HRT-20B HYDRAULIC ROTARY TABLE

RT1000 SHT 6 OF 6

TOP THRUST BUSHING ASSEMBLY

FOR HRT-20B ONLY

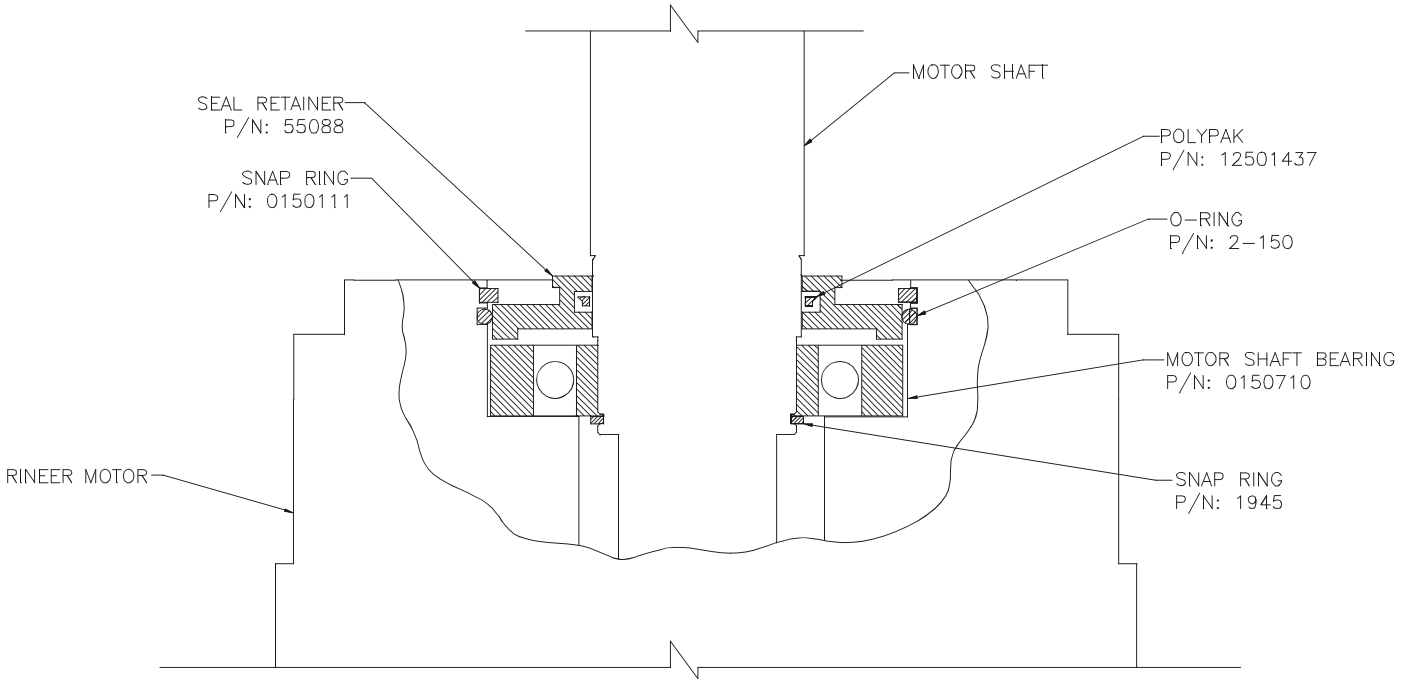
ASSEMBLY NO. RT1007

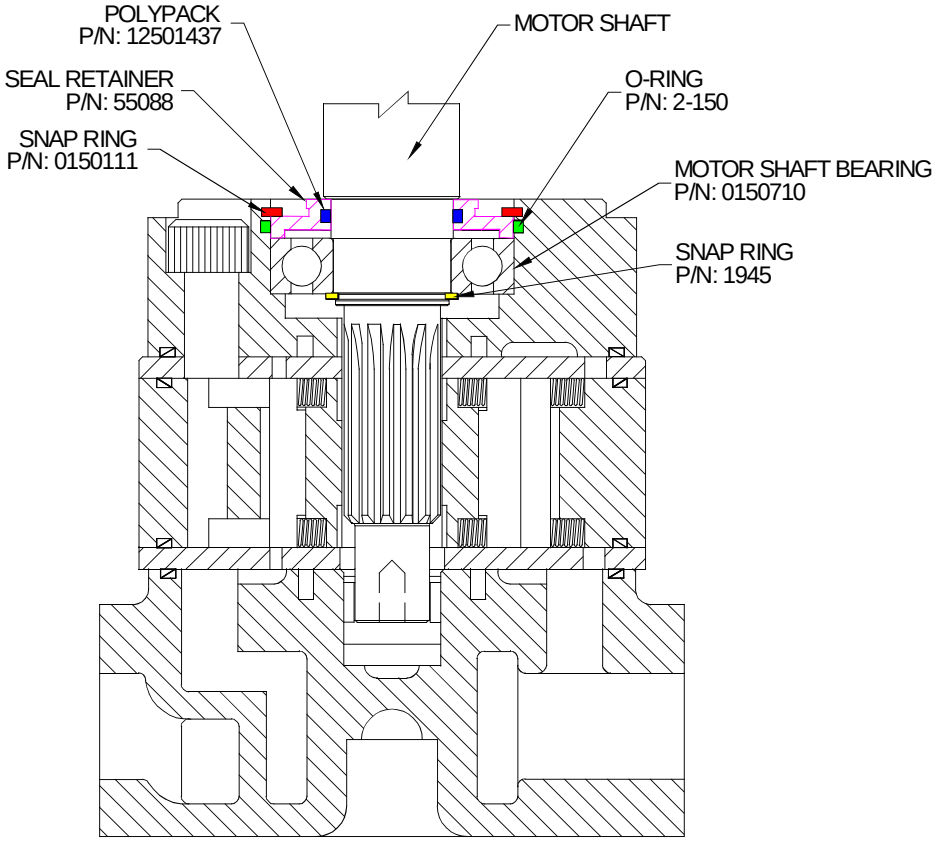
REV.#	BY	LOG #	DESCRIPTION OF REVISION
3	DSB	10-11-99	Change Qty. of Garlock pads fm 16 to 8, one side only.
2	NM	11-02-98	Show pads on top side only.
1	SAL	96-10-007	Change matl. from bronze to aluminum.

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

DATE: 10/02/00 BY: DT

REF: S:\Equip Manuals\Dwgs\Rotary Tbls\RT1000 sh6 of 6.wpg





W/ OUT WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

1		09/03/02
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\Motor\Motor CLE5500+ sht2 rev1.wpg

HRT-20B HYDRAULIC ROTARY TABLE
BILL OF MATERIALS

Item No.	Qty. Reqd	Part No.	Description
1	1	RT1020	Top Mounting Flange
2	1	RT1002-A	Rotary Swivel
3	5	CLEBU9656	Rotary Seal
4	12	1049	HHCS - 3/8"-16 x 1 1/2"
5	1	RT1004	Upper Seal Retainer
6	1	RT1011	Upper Housing
7	2	1001	Grease Zert - 1/8"
8	2	1400239	Oil Seal
9	1	RT1003	Main Hub
10	1	RT1006	Top Bushing
11	2	2-459	O Ring 15"ID 15 1/2"OD 1/4"W
12	2	8-459	Backup Ring
13	1	RT1007	Top Thrust Bushing Assy.
14	1	RT1008	Ring Gear
15	10	259	SHCS - 5/8"-11 x 2 1/2"
16	1	140TP158	Thrust Bearing
17	4	RT1009-A	Motor Shaft
18	4	1899	Bearing, 308 SZZ
19	1	RT1001	Lower Housing Weldment
20	1	RT1010	Bottom Bushing
21	30	134	Lockwasher - 3/8"
22	2	RT1015	Seal Retainer Gasket
23	1	RT1023	O Ring 27.1875 OD 3/16 T
24	1	RT1017	Swivel Retainer Ring Assy.
25	1	CLEBU9655	External Snap Ring
26	4	RT1022	Rineer Hyd. Motor GA15
27	4	RT1016	Motor Gasket
28	16	1106-A	SHCS - 1/2"-13 x 1 1/2"
29	16	1103	Lockwasher - 1/2"
30	12	1237	SHCS - 7/8"-9 x 3 1/4"

Item No.	Qty. Reqd	Part No.	Description
31	12	1224	Lockwasher - 7/8"
32	1	RT1018	Locking Pin
33	1	RT1013	Locking Pin Handle
34	1	RT1035	Hitch Pin
35	1	RT1024	Compression Spring
36	1	RT1040	Lower Seal Retainer
37	6	1047	HHCS - 3/8"-16 x 1"
38	1	RT1041	Dip Tube
39	1	1609	Flush Plug - 3/8" NPT
40	3	RT1021	Swivel Spacers
41	2	2-208	O Ring 5/8"ID 7/8"OD 1/8"W
42	15	238	SHCS - 3/8"-16 x 1 1/2"
43	1	2-461	O Ring 16"ID 16 1/2"OD 1/4"W
44	6	1238	Set Screw - 1/2"-13 x 1 1/4"
45	4	RT1026	Motor Bearing Shims
46	2	58063	Set Screw - 5/8"-11 x 1 1/4"
47	10	1239	SHCS - 3/4"-10 x 4 1/2"
48	---	----------	----------
49	1	1610	Flush Plug - 3/4" NPT
50	2	1499-A	Sight Glass Plug - 3/4"-10 NPT
51	1	RT1030	Upper Manifold Weldment
52	1	RT1031	Lower Manifold Weldment
53	32	1229	SHCS - 7/16"-14 x 2 1/2"
54	8	2-222	O Ring 1 1/2"ID 1 3/4"OD 1/8"W
55	32	1082	Lockwasher - 7/16" Hi Collar
56	1	RT1019	Locking Pin Housing
57	1	55088	Seal Retainer

HRT-20C HYDRAULIC ROTARY TABLE
BILL OF MATERIALS

Item No.	Qty. Reqd	Part No.	Description
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8	2	1400239	Oil Seal
9	1	RT1051	Main Hub
10	1	RT1006	Top Bushing
11	2	2-459	O Ring 15"ID 15 1/2"OD 1/4"W
12	2	8-459	Backup Ring
13	1	RT1052	Spacer
14	1	RT1008	Ring Gear
15	10	259	SHCS - 5/8"-11 x 2 1/2"
16	2	140TP158	Thrust Bearing
17	4	RT1053	Motor Shaft
18	4	1899	Bearing, 308 SZZ
19	1	RT1050	Lower Housing Weldment
20	1	RT1010	Bottom Bushing
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22	2	RT1015	Seal Retainer Gasket
23	1	RT1023	O Ring 27.1875 OD 3/16 T
24	1	RT1017	Swivel Retainer Ring Assy.
25	1	CLEBU9655	External Snap Ring
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27	4	RT1016	Motor Gasket
28	16	1106-A	SHCS - 1/2"-13 x 1 1/2"
29	16	1103	Lockwasher - 1/2"
30	12	1237	SHCS - 7/8"-9 x 3 1/4"

Item No.	Qty. Reqd	Part No.	Description
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35	1	RT1024	Compression Spring
36	1	RT1040	Lower Seal Retainer
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38	1	RT1055	Dip Tube
39	1	1609	Flush Plug - 3/8" NPT
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51	1	RT1030	Upper Manifold Weldment
52	1	RT1031	Lower Manifold Weldment
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54	8	2-222	O Ring 1 1/2"ID 1 3/4"OD 1/8"W
55	32	1082	Lockwasher - 7/16" Hi Collar
56	1	RT1019	Locking Pin Housing
57	1	55088	Seal Retainer

SECTION 5 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

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4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com