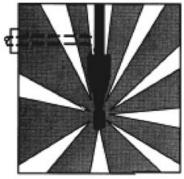
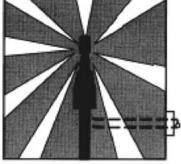


2" AND 3" TROLL BALLS OPERATION & MAINTENANCE INSTRUCTIONS



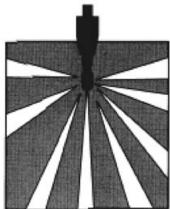
Standard High Impact Patterns for Troll Ball





Pattern C

Pattern D







Pattern H

GENERAL

The SELLERS TROLL BALL™ is a hydraulically driven rotating head with hole patterns ejecting streams of liquid for spanning internal tank surfaces to be cleaned, sanitized, treated, or rinsed. Specially designed for small apertures, the 2" model will fit through an opening as small as a 2" and the 3" size, a 3" (3.06" I.D.) schedule 40 pipe. The unit may be installed on a permanent basis (C.I.P.) or be fitted for use in a portable manner. Many types of fluids, sanitizers, detergents, solvents, and caustics may be used through this unit to assist its cleaning effectiveness. (Please note caution below) The cleaning effectiveness of any unit is proportional to all the applicable variables, such as volume, pressure, chemicals, impingement, drainage, soils, etc. The unit will only operate properly when mounted in the vertical position (upright or suspended), provisions can be made to alter the unit for operation in any attitude. With the choice of impact patterns it can clean almost any type of contained area within its range.



Caution: If chemicals, hazardous materials, operations, and equipment are used in conjunction with this cleaning equipment, it is the responsibility of the user to establish appropriate associated safety and health practices. Prior to application, the user must consult and determine the applicability of regulatory (federal, state, local and facility) safety and environmental agency limitations.

MATERIALS

The TROLL BALL is made of 316 (UNS S31600) stainless steel with the exceptions of the rotor, bushing, and washer, which are made of virgin Teflon. No lubricants are required.

CONSTRUCTION

Referring to drawing 75-14-X(B) and 75-16-X(B), the unit consists of two basic components; the drive, comprising of the motor, rotor disk, shaft assembly, washer and the ball; and the housing, comprising of the inlet cap, bushing, and body. This unit's construction does not contain any external drive components, such as gears, or require lubrication of any kind.

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ROTATION

The liquid enters the inlet cap (1) and then flows through the oblique and bypass holes in the motor (2) causing the rotor disk (3) to rotate at high speed. The unique construction of the rotor disk allows the side opposite the holes to strike the driving arm of the shaft (7) rotating it ahead about 3° to 4° per revolution of the rotor disk. Thus, for every 100 revolutions of the rotor disk there is 1 revolution of the driving arm, which is part of the shaft, creating 1 revolution of the ball. The liquid streams that pass through the drive holes and down the bypass in the motor combine in the shaft and are distributed out the holes in the ball. The rotational speed of these units can be regulated through the use of various motor bypass plugs, which influences the fluid diversion to provide additional speed, reference the trouble shooting section and the drawing parts list for additional information and location.

THROUGHPUT

The amount of liquid going through a TROLL BALL is proportional to the pressure applied and the ball hole pattern. Increasing the pressure will increase the throughput. For specific information refer to the flow curve. Please note the operating pressure range.

CLEANING/WETTING RADII

The cleaning and wetting distances are a function of rotational speed and liquid pressure applied. The slower the ball rotates and the higher the pressure applied, the greater the distances. The maximum wetting radius for the 2" model is about 12 ft (3.7 m) and the 3" model is about 20 ft (6.1 m). The EFFECTIVE CLEANING RADIUS for the 2" model is 6 ft (1.8 m) and the 3" model is 12 ft (3.7 m), but the actual results will also depend on the type and condition of soils to be removed.

SUPPLY SOLUTION PRESSURE

The minimum amount of liquid that will satisfactorily run the 2" TROLL BALL is about 13 GPM (2.6 M³/ hr) at 50 PSI (3.5 BAR) and the maximum is about 34 GPM (17.7 M³/ hr) at 200 PSI (14 BAR). The Sellers B1000 or B1250 Jets will supply the mid-range of these parameters for a single unit.

INSTALLATION

The TROLL BALL is very easy to install as it has a single female pipe thread connection. It may be installed on a tripod, suspended from a pipe, manhole cover, etc, but the unit must be vertical. The factory will preset the approximate speed (RPM) and spray pattern for the particular field application. In all installations a suitable strainer should be used (such as a 20 Mesh "Y" strainer) to prevent dirt or scale from clogging the waterways or openings.



Warning: In closed tanks, provisions should be made for adequate venting during operation to allow the escape of any gases or volatile vapors, which may be produced during operation. This will also prevent the tank from collapsing due to vacuum formation, which can be caused by a cold rinse cycle in a warm tank.

OPERATION

To start the unit, turn on the fluid. An in-line valve is advised for a slow build-up of liquid pressure in the unit to prevent "water hammer". To stop the unit, turn off the liquid. The unit should always be handled carefully. If the unit is dropped or maltreated it may cause internal damage to the drive assembly, which in turn can affect the performance of the unit.

OPERATION & SPECIFICATION SHEET

2" Model

Refer to drawing 75-14-X(B), for assembly and parts list.

Pipe Connection 3/4" Female NPT
Operating Pressure Range 50-200 PSI (3.5-14 BAR)
Maximum Operating Temperature 250° F (121° C)

Flow Capacity 13-34 GPM (2.6 – 17.7 M³/hr)

Head Rotation Speed (Factory Set) 3-15 RPM

*Effective Cleaning Radius To 6 ft maximum (1.8 m)
Effective Wetting Radius To 12 ft maximum (3.7 m)

Overall Head Length x Body Diameter Approximate Weight 2 lbs. 1 oz
Materials of Construction 316 Stainless Steel & Teflon

**Recommended Solution Strainer

(supplied by user - not included) 20 Mesh (1/32" openings)

3" Model

Refer to drawing 75-16-X(B), for assembly and parts list.

Pipe Connection 1 1/2" Female NPT
Operating Pressure Range 50-200 PSI (3.5-14 BAR)

Maximum Operating Temperature 250° F (121° C)

Flow Capacity 30-76 GPM (6.8 – 17.3 M³/hr)

Head Rotation Speed (Factory Set) 3-15 RPM

*Effective Cleaning Radius To 12 ft maximum (3.0 m)
Effective Wetting Radius To 20 ft maximum (6.1 m)

Overall Head Length x Body Diameter 8.98" x 2 7/8 Dia. (235mm x 73mm Dia.)

Approximate Weight 4 3/4 lbs (2.1 kgs)

Materials of Construction 316 Stainless Steel & Teflon

**Recommended Solution Strainer

(supplied by user - not included) 20 Mesh (1/32" openings)

*Depends on type and conditions of soils to be removed.

**Required for most applications to prevent fouling or plugging of the unit from foreign material, i.e., scale, grit, and soils

in solution. Additional strainers and/or finer mesh screens may be required depending upon the amount, nature, and

size of foreign materials in solution.

NOTE: Consult with Sellers where operating conditions are not covered in the above specifications.

TROUBLE SHOOTING

Due to the simplicity of the unit, very few problems should occur. If any trouble should arise, the following steps may be taken: Refer to the drawings 75-14-X(B), 2" TROLL BALL and 75-16-X(B), 3" TROLL BALL.

- A. Check units for external damage, look for evidence of mishandling that may have damaged shaft, bearings, or alignment.
- B. If the ball fails to rotate and no liquid passes:
 - 1. Check for liquid pressure and volume at the unit.
 - 2. Check strainer for filter blockage.
 - 3. Remove ball (8) by removing pin or bolt (10-2") (13-3") and check for clogged jet holes.
 - 4. Recheck for flow through the shaft.
- C. If the shaft fails to rotate and sufficient liquid passes:
 - 1. Check for shaft freedom, by hand, in the vertical and rotational axis
 - 2. If the ball is free, insert a motor bypass plug. If the unit now rotates, the problem is minor friction. If the unit still does not rotate, check for:
 - a. Contamination and obstructions in the unit.
 - b. Wear of the Teflon parts: the bushing, washer, and the rotor disk.
 - c. Galling and straightness of the shaft.
 - d. Screws (10-2") (13-3") for tightness.

Replace all defective parts. No lubrication!

SERVICING-DISASSEMBLY

- A. Refer to the drawings 75-14-X(B), 2" TROLL BALL and 75-16-X(B), 3" TROLL BALL.
- 1. Remove ball (8) by removing spring pin or bolt (10-2") (13-3").
- 2. Unscrew inlet cap (1) from body (4).
- 3. Gently push shaft (7) up into body (4) and remove the motor (2) and rotor disk (3).
- 4. Continue to push shaft (7) thru body (4) and remove shaft completely.
- 5. Remove bushing (6) and washer (5) from body (4).
- 6. The shaft (7) is a one piece assembly with the driving arm attached on the 2" troll ball. On the 3" troll ball the shaft (7) has a driving arm (10) attached by mounting screws (9).
- 7. The 3" body (4) has a bottom cap (11) that may need to be removed.

SERVICING-ASSEMBLY

- A. Refer to the drawings 75-14-X(B), 2" TROLL BALL and 75-16-X(B), 3" TROLL BALL.
 - 1. The body (4) and lower cap (11) must be assembled. (75-16-X(B) ONLY)
- 2. Align the holes in the driving arm (10) with the holes in the shaft (7) and install screws. (75-16-X(B) only)
- 3. Locate the bushing (6) and washer (5) onto the shaft (7).
- 4. Lower the shaft (7) and bushing into the body (4) bore.
- 5. Gently push shaft (7) into body, place rotor disk (3) on shaft (7) and locate motor (2) thru hole in rotor and shaft.
- 6. Gently lower the shaft, rotor, motor assembly into the body (4) until shaft locates on washer (5) and bushing (6) and push into body.
- 7. Install the cap (1) into the body.
- 8. Install the ball (8) onto the shaft and insert pin or bolt (10-2") (13-3").
- 9. On the bolted assemble install lockwasher (11) and hex nut (12) and tighten.

PARTS FOR 2" TROLL BALL™ (75-14-X & 75-14-XB)

Parts for units with serial numbers of 1000 and higher and/ or serial numbers under 1000 with and additional capital "M" indicate complete factory modernization.

PART NO.	REFERENCE NO.	DESCRIPTION
1	75-1403	Cap, Inlet
*2	75-1453	Motor
*3	**75-1445	(STD) Disk, Rotor
4	75-1467	Body
*5	**75-1416	Washer
*6	**75-1408	Bushing
*7	75-1437	(STD) Shaft, Troll Ball
	75-1437B	(BOLTED) Shaft, Troll Ball, Bolted
8	Std Troll Ball	Ball- w/ solid stream
	75F-1443 ("C" Pat)	for 75-14-C
	75F-1444 ("D" Pat)	for 75-14-D
	75F-1440 ("G" Pat)	for 75-14-G
	75F-1448 ("H" Pat)	for 75-14-H
	Bolted Troll Ball	
	755 4440D ("C" Dot)	for 75 44 CD
	75F-1443B ("C" Pat) 75F-1444B ("D" Pat)	for 75-14-CB for 75-14-DB
	75F-1444B ("B" Pat)	for 75-14-DB
	75F-1448B ("H" Pat)	for75-14-HB
	701 1440B (11 1 dt)	10175-14-ПВ
9	Plugs, Motor Bypass	
	***7-33-1	Solid
	75-1455-A	Orifice.06
	***75-1455-B	Orifice.09
*40	75-1455-C	Orifice.12
*10	75-1415	(STD)Pin,Spring
44	1-401-1	(BOLTED) Screw, Rd. Hd. #10-32 x
11	20-12-1	1.0 Lock washer, Split, #10 Thd
12	108331	Nut, Hex, @12-32 Thd

^{*}Recommended spare parts – 75-14-SPK (std)

^{**}For special applications where Teflon cannot be tolerated, UHMW-PE (Gardur) may be substituted at additional cost.

^{***}Plugs supplied with unit

PARTS FOR 3" TROLL BALL™ (75-16-X & 75-16-XB)

PART NO. 1 *2 *3 4 *5 *6 *7 8	REFERENCE NO. 75-1603 75-1605 **75-1628 75-1601 **75-1609 **75-1608 75-1606 75-1606B Std Troll Ball 75F-1615 ("C" Pat) 75F-1620 ("D" Pat) 75F-1622 ("G" Pat)	DESCRIPTION Cap, Inlet Motor (STD) Disk, Rotor Body Washer Bushing (STD) Shaft, Troll Ball (BOLTED) Shaft, Troll Ball, Bolted Ball- w/ solid stream for 75-16-C for 75-16-D for 75-16-G for 75-16-H
	Bolted assembly 75F-1615B ("C" Pat) 75F-1620B ("D" Pat) 75F-1622B ("G" Pat) 75F-1625B ("H" Pat)	for 75-16-CB for 75-16-DB for 75-16-GB for 75-16-HB
* 9 *10 11 12 *13 *14 *15	2-61-1 75-1436 75-1604 Plugs, Motor Bypass ***74-375 ***75-1624-C 75-1415 2-97-1 20-12-1 108331	Screw, Rd Hd, 8-32 X .375" Arm, Driving Cap, Bottom Solid Orifice Æ.22 (STD) Pin, Spring (BOLTED) Screw, Rd Hd, #10-32 x .375 Lock Washer, Split, #10 Thd Nut, Hex, #10-32 Thd
	75-1627 75-1617 75F-1431 75-1614 75-1613 75-1637	Plug, use w/ C-D-G Balls Plug, use w/ H Ball Plug, use w/ B-E-F Balls Nozzle, Vertical Spray (B-C-H) Nozzle, Solid Stream Nozzle, Fan Spray

^{*}Recommended spare parts – 75-16-SPK (std)

**For special applications where Teflon cannot be tolerated, UHMW-PE (Gardur) may be substituted at additional costs.

***Plugs supplied with unit

