

**CYRANO - SPARK - STEN 2001
PNEUMATIC SPEARGUNS**

mares®

46. Remove snap ring (72).



It is not necessary to remove the snap ring (72) during routine service, unless it or the barrel is to be replaced.

47. Remove barrel (26) from the jaws.

▶ CLEANING

The parts used to manufacture MARES spearguns do not require special cleaning. Acids or solvents should not be used to clean any speargun parts. A clean shop rag can be used to remove any oil or grease that remains on the parts prior to inspection.

▶ INSPECTION

All o-rings should be replaced during routine servicing (maintenance kit part # 164290). If the following parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below. Replace any part with these flaws.

Barrel (26 Cyrano - Spark - Sten 2001)	Inspect for any scratches or foreign material inside the barrel. Then check the outer surface for scratching and/or chipping around the O-ring sealing areas.
Barrel bushing (21 Cyrano - Spark - Sten 2001)	Inspect for any signs of cracking, distortion or brittleness.
Snap ring (72 Cyrano - Spark - Sten 2001)	Inspect for any signs of cracking, distortion or brittleness.
Piston (17 Cyrano - Spark) (N Sten 2001)	Inspect for any cracks or distortion.
Oil wiper (19 Cyrano - Spark) (N Sten 2001)	Inspect for any cuts, distortion or foreign material. Any of these flaws may cause leakage.
Shock absorber (2 Cyrano - Spark - Sten 2001)	Inspect for any signs of cuts or distortion.
Shock absorber insert (3 Cyrano - Spark - Sten 2001)	Inspect for any cracks or distortion.
Power regulating block (70 Cyrano - Spark) (D Sten 2001)	Inspect for any cracks or distortion.
One-way seat (68 Cyrano - Spark - Sten 2001)	Inspect for any signs of cuts or distortion.
Power adjustment rod (35 Cyrano - Spark) (L Sten 2001)	Inspect the surface of the rod for scratching, distortion or cracking. Also make sure that the O-Ring seat (39) is securely tightened on the power adjustment rod.
Handle (41 Cyrano - Spark) (H Sten 2001)	Inspect for any cracks or distortion. Check all O-ring seating surfaces for any signs of scratching, distortion or cracking.
Connecting plunger (45 Cyrano - Spark - Sten 2001)	Inspect the surface for distortion or scratching.
Catch hook (50 Cyrano - Spark - Sten 2001)	Inspect the surface of the catch hook that engages the piston for any signs of wear. Replace the catch hook if any signs of wear are present.
Inlet valve (32) (32 Cyrano - Spark) (M Sten 2001)	Inspect the seating and sealing surfaces for cracks, scratches, distortion or foreign material.

Springs	Inspect for any signs of distortion.
O-Rings	Inspect for any cuts, distortion or foreign material. Any of these flaws may cause leakage.
Shaft	Inspect the shaft for straightness and corrosion. Check the tapered shaft sleeve, washer and line retainer for wear and replace with original Mares parts if necessary.

CAUTION !

REPLACE ANY PARTS WITH DAMAGED THREADS. ALL THREADED PARTS MUST BE CLEAN AND IN GOOD CONDITION. INSTALLING ANY PART WITH DAMAGED THREADS MAY CAUSE IT TO CROSS-THREAD RESULTING IN DAMAGE TO THE SPEARGUN.

REASSEMBLY

NOTE Before reassembly, lightly lubricate all o-rings with MARES grease (MOBIL PLEX 47 or equivalent). Lubricating o-rings before installation will minimize the risk of damage to the o-rings during reassembly.

1. Place the barrel in the 16 mm. jaws (A-1) (Fig. 3) and clamp into vise (Fig. 14).

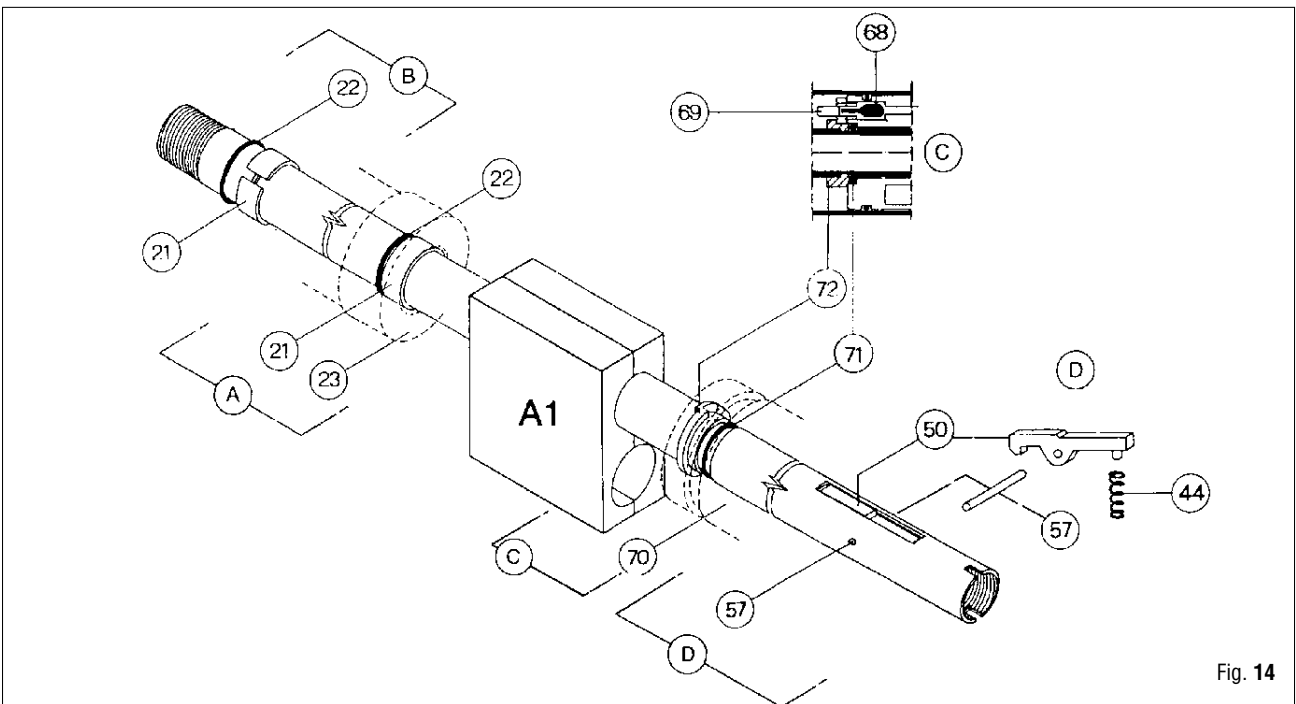


Fig. 14

2. Install one barrel bushing (21) in the inner groove of the barrel with tool A-7 (Fig. 14-A). (only Cyrano version)
3. Place one o-ring (22) against the barrel bushing (21) with tool A-7 (Fig. 14-A). (only Cyrano version)
4. Place o-ring (29) on the nose cone reinforcement (23). (only Cyrano version)

32. Insert bushing (47), O-ring (46) and guide bushing (51) (if any) into the handle (41). Gently tighten the bushing (47) into its housing in the handle with tool A-22 (Fig. 10).

CAUTION !

TORQUE BUSHING (47) TO 140 N/CM. (12.5 lbs. in. approx.) OVER TIGHTENING THE BUSHING MAY RESULT IN DAMAGE TO THE HANDLE CAUSING LEAKAGE.

33. Insert the rounded end of the connecting plunger (45) into the bushing (47) using a special tool A-13 (Ø 1.5 mm) or needle nose pliers.
34. Place o-ring (60) into groove of safety bar (59).
35. Insert the safety bar (59-60) into the handle from the opposite side that contains the power adjustment lever.
36. Align the safety bar retainer (58) and press it into the safety bar until the latch engages.
37. Install trigger adjustment screw (48) into trigger body (52) (Fig. 18-A). With a 6 mm wrench, tighten trigger adjustment screw (48) into trigger body (52), until it protrudes approximately 4 mm. (Fig. 18-B).
38. Align the hole in the trigger with the holes in the handle (41) and install trigger pin (53).
39. Position the grip (61) on the handle (41) and install grip pin (62), from the power adjustment lever side.
40. Pull trigger and remove shaft with piston (A-16) attached.
41. Remove piston (A-16, part # 164209) from the shaft.
42. Open the jaws and remove barrel (26).
43. With a rotating motion, install tank (25) using jaws (A-3) if necessary.
44. Fill the barrel (26) with oil according to the quantities shown in the table below.

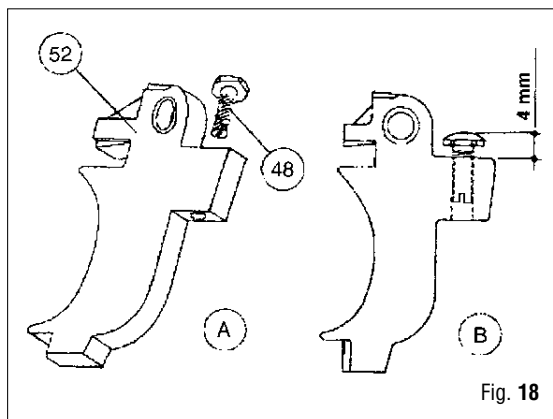


Fig. 18

CAUTION !

USE ONLY CORROSION AND RUST PREVENTING OILS, SUCH AS MOBIL DTE OIL LIGHT OR SAE 10 W OILS SUITABLE FOR USE IN HYDROPNEUMATIC SYSTEMS. DO NOT USE GRAPHITE BASE OILS! THE USE OF OILS NOT SPECIFIED FOR USE IN HYDROPNEUMATIC SYSTEMS MAY LEAD TO PREMATURE GUN DAMAGE DUE TO INTERNAL CORROSION.

SPEARGUN	OIL QUANTITY IN CC
CYRANO 550 - SPARK 550	20
CYRANO 700 - SPARK 700	25
CYRANO 850 - SPARK 850	25
CYRANO 970 - SPARK 970	30
CYRANO 1100 - SPARK 1100 Pipin	30

SPEARGUN	OIL QUANTITY IN CC
STEN MINIMINI	15
STEN MINIMINI	20
STEN MEDI	25
STEN	30
SUPER STEN	30

► PRESSURIZING USING MARES HAND PUMP (PART #691101)



WARNING !

ALWAYS PRESSURIZE THE SPEARGUN WITH THE POWER ADJUSTMENT LEVER IN THE MAXIMUM "HIGH" POWER POSITION (FIG. 1). NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. FAILURE TO PRESSURIZE THE SPEARGUN IN THE MAXIMUM "HIGH" POWER POSITION OR OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

1. Set the power adjustment lever (38) to maximum "high" power position (Fig. 2).
2. By hand, thread the hand pump into the inlet valve of the speargun, until the hand pump o-ring seals against the inlet valve body.
3. The following pressure table shows the approximate number of pump strokes required to obtain the pressure values listed.

CYRANO VERSION

DESCRIPTION	PRESSURE IN BAR				
	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)				
CYRANO 550	125	185	250	330	410
CYRANO 700	150	230	310	390	480
CYRANO 850	210	330	450	580	710
CYRANO 970	260	395	575	755	925
CYRANO 1100	320	510	700	870	1055

SPARK VERSION

DESCRIPTION	PRESSURE IN BAR				
	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)				
SPARK 550	181	268	363	479	595
SPARK 700	218	334	450	566	696
SPARK 850	305	479	653	841	1030
SPARK 970	377	573	834	1095	1341
SPARK 1100 Pipin	464	740	1015	1262	1530

STEN 2001 VERSION

DESCRIPTION	PRESSURE IN BAR					
	LENGTH (cm)	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)					
STEN MINIMINI	42	60	130	170	210	240
STEN MINIMINI	58	140	220	340	450	550
STEN MEDI	70	200	280	440	560	700
STEN	84	270	430	580	750	1000
SUPER STEN	100	370	550	750	980	1300

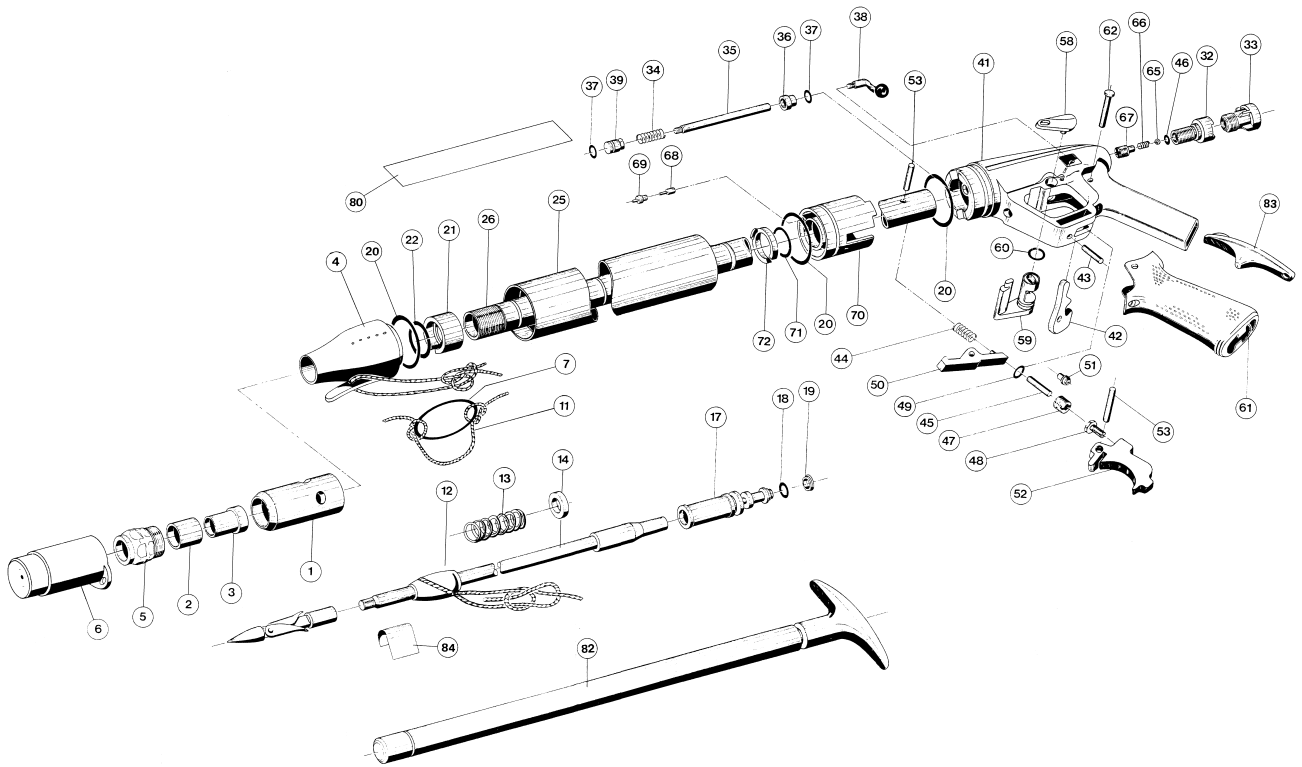


WARNING !

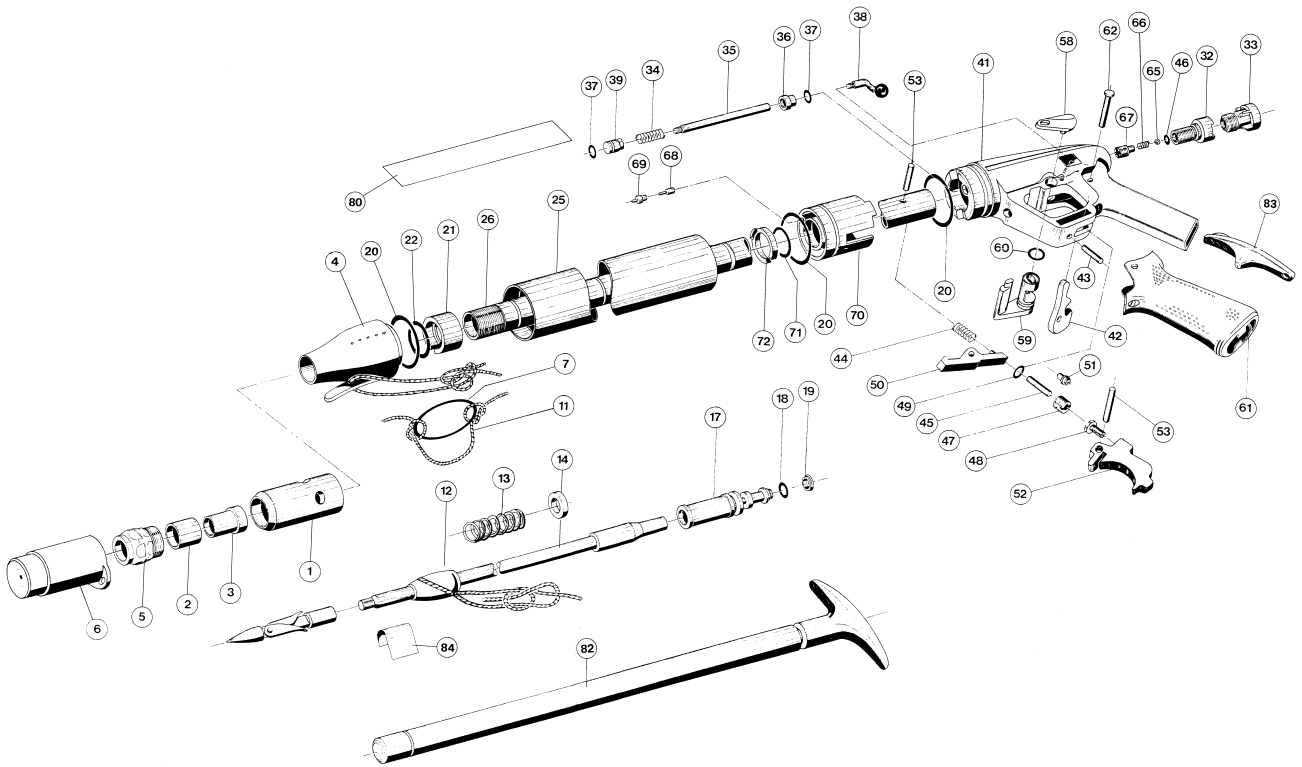
THE NUMBER OF PUMP STROKES LISTED IN THE PRESSURE TABLE REFER TO A COMPLETELY EMPTY SPEARGUN TANK. IF IT IS NOT POSSIBLE TO DETERMINE THE EXISTING PRESSURE IN THE SPEARGUN, ALL PRESSURE MUST BE RELEASED FROM THE SPEARGUN PRIOR TO PRESSURIZING IT. IF THE EXISTING PRESSURE IN THE SPEARGUN IS KNOWN AND IT BECOMES NECESSARY TO ADD PRESSURE, ONLY INCREASE IT THE AMOUNT OF THE DIFFERENCE. FOR EXAMPLE, TO INCREASE THE PRESSURE OF A CYRANO 700 FROM 20 BAR TO 30 BAR, 170 PUMP STROKES ARE REQUIRED. NOT THE FULL 480 PUMP STROKES SHOWN IN THE TABLE. NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH. PNEUMATIC SPEARGUNS ARE HIGHLY PRESSURIZED. NEVER POINT THE SPEARGUN AT YOURSELF OR ANYONE ELSE. VIOLATION OF THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH.

4. Remove the hand pump from the inlet valve.

Drawing No. F 206	STEN 2001 SPEARGUN	Drawing updated on 01/06/2001
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DRAWING CONTINUED FROM PREVIOUS TABLE

Table No. 504	STEN 2001 SPEARGUN	Drawing reference No.: F 206 Table updated on 30/10/2001
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Ref. N.	Code	Description
1	A	Black Sten 2001 head body
2	43163856	Shock absorber , rubber
3	43163409	Shock absorber insert
4	43200093	Nose cone
5	43164016	Head ring nut
6	43164008	Black head cap
7	43163968	Rubber ring - shock
11	43169821	Shock line - m 3
11	43169818	Shock line - m 5
12	43163355	Shock line runner for rod D. 8
13	43163354	D. 8 Rod spring
14	43163505	D. 8 rod washer
17	N	Piston body
18	46110110	OR 2037
19	N	Oil wiper piston
20	46110208	Special OR
21	43163665	Bushing OR 87
22	46110206	OR 122 bis
25	43200069	Sten Minimini Tank
25	43200070	Sten Mini Tank
25	43200071	Sten Medi Tank
25	43200072	Sten Tank
25	43200073	Sten Super Tank
26	43200064	Miniminsten Rod
26	43200057	Ministen Rod
26	43200059	Medisten Rod
26	43200063	Sten Rod
26	43200061	Canna Super Rod
32	M	Inlet valve body
33	43163563	White valve cap
34	L	Spring - power adjustment
35	L	Rod - power adjustment
36	L	Press OR power adjustment
37	46110102	OR 2015
38	L	Lever power adjustment
39	L	OR port for power adjustment
41	H	Mares Sten 2001 C/R handle
41	G	Mares Sten 2001 S/R handle
42	43163668	Line release, black
43	43163614	Pin - line release
44	43163313	Spring catch hook
45	43164282	Connection piston
46	46110201	OR 1
47	14364284	Connection piston bushing

Ref. N.	Code	Description
48	E	Trigger adjustment scree
49	46110242	OR 2-003 Apnea Syste
50	43163377	Catch hoo
51	43200095	Sten 2001 piston compas
52	E	Cyrano trigger bod
53	43163337	Pin 4 x 2
57	43200098	Pin 4 x 23.
58	43164237	Safety sto
59	43164236	Safety bod
60	46110106	OR 106
61	43164300	White heelplate
62	43164233	Cyrano heelplate fixing pin
65	M	Ball bearing - inlet valve
66	M	Spring - inlet valve
67	M	OR button inlet valve
68	43163635	Seat, one way valve
69	43163636	Housing, one way valve
70	D	Power regulator block
71	46110220	OR 2062
72	43163518	Elastic ring - block
80		Sten minimini label
80		Sten mini label
80		Sten medi label
80		Sten label
80		Sten super label
83	43160710	Hinge load 94
		ASSEMBLIES
82	416803	Screw injector
A	43200066	Sten 2001 assembly head (1-2-3-5)
D	43163638	Adjustment block assembly (68-69-70)
E	43164230	Cyrano trigger assembly (48-52)
G	43200097	S/Reg. handle Sten 2001 (41-42-43-46-47-49)
H	43200096	C/Reg. handle Sten 2001 (L- 38-41-42-43-46-47-49)
L	43163937	Power adjustment assembly (34-35-36-37-39)
M	43163941	Inlet valve assembly (32-46-65-66-67)
N	43163629	Piston assembly (17-18-19)
P	43163683	Miniminsten sheathing assembly
***	43163979	Seal assembly series Sten 2001/Sten (18-19-20-22-37-46-49-60-71)

▷ **SPEARGUN TROUBLESHOOTING**

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - AIR LEAK FROM THE MUZZLE	CYRANO SPARK STEN STEN 2001	1) Piston O-Ring dirty, defective or damaged	1) Replace the O-Ring
		2) Piston cap dirty, defective or damaged	1) Replace the piston cap
		3) Barrel scratched or damaged	1) Replace the barrel
- 2 - AIR LEAK FROM THE POWER REGULATOR	CYRANO SPARK STEN STEN 2001	1) Power control rod O-Ring dirty, defective or damaged	1) Replace the O-Ring
		2) Power control rod scratched or damaged	1) Replace the power control rod
		3) O-Ring seat in handle dirty, defective or damaged	1) Clean or replace the handle
- 3 - AIR LEAK FROM RECHARGE VALVE	CYRANO SPARK STEN STEN 2001	1) Foreign particles in recharge valve body	1) Clean the recharge valve body
		2) Recharge valve O-Ring dirty, defective or damaged	1) Replace the O-Ring
		3) Recharge valve ball defective or damaged	1) Replace the ball
		4) O-Ring seat in recharge valve dirty, defective or damaged	1) Clean or replace the valve body
- 4 - AIR LEAK FROM TRIGGER	CYRANO SPARK STEN STEN 2001	1) Connecting piston O-Ring dirty, defective or damaged	1) Replace the O-Ring
		2) Connecting piston scratched or damaged	1) Replace the connecting piston
		3) O-Ring seat in handle dirty, defective or damaged	1) Clean or replace the handle
- 5 - AIR LEAK BETWEEN TANK AND WISHBONE	CYRANO SPARK STEN STEN 2001	1) O-Ring dirty, defective or damaged	1) Replace the O-Ring
		2) Tank damaged	1) Replace the tank
		3) Wishbone O-Ring seat defective or damaged	1) Replace the wishbone
- 6 - AIR LEAK BETWEEN THE TANK AND HANDLE	CYRANO SPARK STEN STEN 2001	1) O-Ring dirty, defective or damaged	1) Replace the O-Ring
		2) Tank damaged	1) Replace the tank
		3) O-Ring seat in handle defective or damaged	1) Replace the handle
- 7 - INSUFFICIENT POWER	CYRANO SPARK STEN STEN 2001	1) Power regulator on "reduced pressure" setting	1) Change to "full power" setting
		2) Speargun pressure low	1) Inspect for leaks and repair and/or load the speargun
- 8 - SHAFT ACCIDENTALLY DISCHARGED WITHOUT PRESSING TRIGGER	CYRANO SPARK STEN STEN 2001	1) Trigger sensitivity too high	1) Correctly adjust trigger sensitivity

▷ **SPEARGUN TROUBLESHOOTING**

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 9 - SHAFT NOT DISCHARGED WHEN TRIGGER IS PRESSED	CYRANO SPARK STEN STEN 2001	1) Trigger sensitivity low	1) Correctly adjust trigger sensitivity
- 10 - PRESSING TRIGGER WITH SAFETY CATCH ENGAGED RELEASES THE PISTON	CYRANO SPARK STEN STEN 2001	1) Safety catch damaged or defective	1) Replace the safety catch
		2) Trigger damaged or defective	1) Replace the trigger
- 11 - DIFFICULTY LOADING THE SPEARGUN	CYRANO SPARK STEN 2001	1) Speargun excessively pressurized	1) Discharge the speargun re-pressurize correctly
		2) Piston damaged or defective	1) Replace the piston
		3) Shock absorber bushing damaged or defective	1) Replace the shock absorber bushing
		4) Spear shaft damaged or bent	1) Replace the spear shaft
- 12 - SPEAR SHAFT DOES NOT REMAIN INSIDE THE PISTON	CYRANO SPARK STEN STEN 2001	1) Spear shaft housing in piston damaged or defective	1) Replace the piston
		2) Spear shaft tailpiece damaged or defective	1) Replace the shaft tailpiece
		3) Non-original spear shaft	1) Replace with an original spear shaft