
The Zodiac Marine Commando

F470

10 Man Inflatable Craft

Field Service Manual

Introduction

Section I – Operation

Section II – Repairs

Section III – Repair,
Replacement and Optional
Parts, Equipment
and Supplies.



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Introduction

General Description

The Zodiac Marine Commando F470-10 man inflatable craft is designed for rugged and military uses, where speed of deployment and infiltration/exfiltration are essential. This boat is self contained and when used with its CO₂ system, will deploy its hull and integrated slatted floorboard and self-inflate within 4 minutes. It, therefore, can be dropped by parachute or during heliborne operations and be deployed in the water or on the ground without the need of assembling floorboards, stringers, or braces.

It is the most advanced and appropriate system to support special operations.

Typical applications include:
U.S. Navy Sea Systems Command (NAVSEA)

U.S. Navy SPECWARGRU
One & Two

U.S. Navy Salvage and Diving
Operations

U.S. Navy Underwater
Construction Battalions (UCB)

U.S. Air Force Special Operations
Combat Control Teams

U.S. Army Readiness Command

U.S. Army Training and

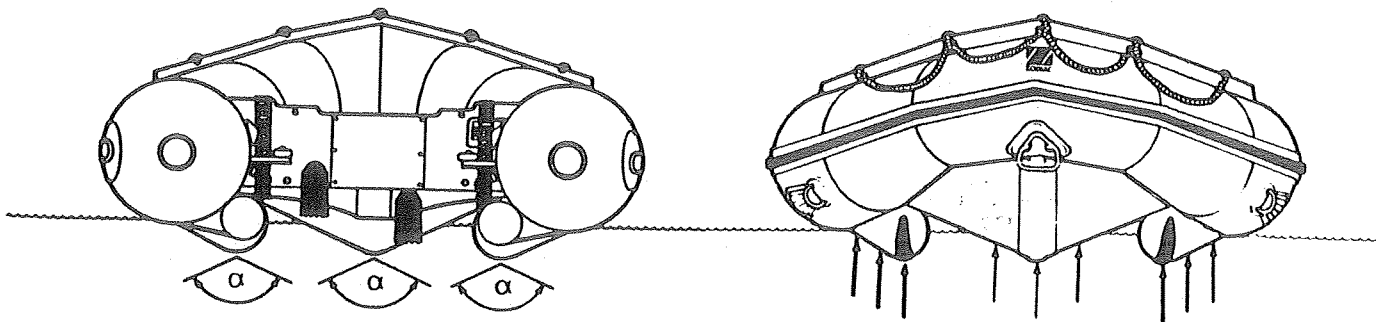
Doctrines Command
U.S. Army Rangers Airborne

U.S. Army Special Forces Group
Airborne

U.S. Army Jungle Operations
Training Center (JOTC)

U.S. Army Joint Special Operations
U.S. Marine Corps.

Futura Technology



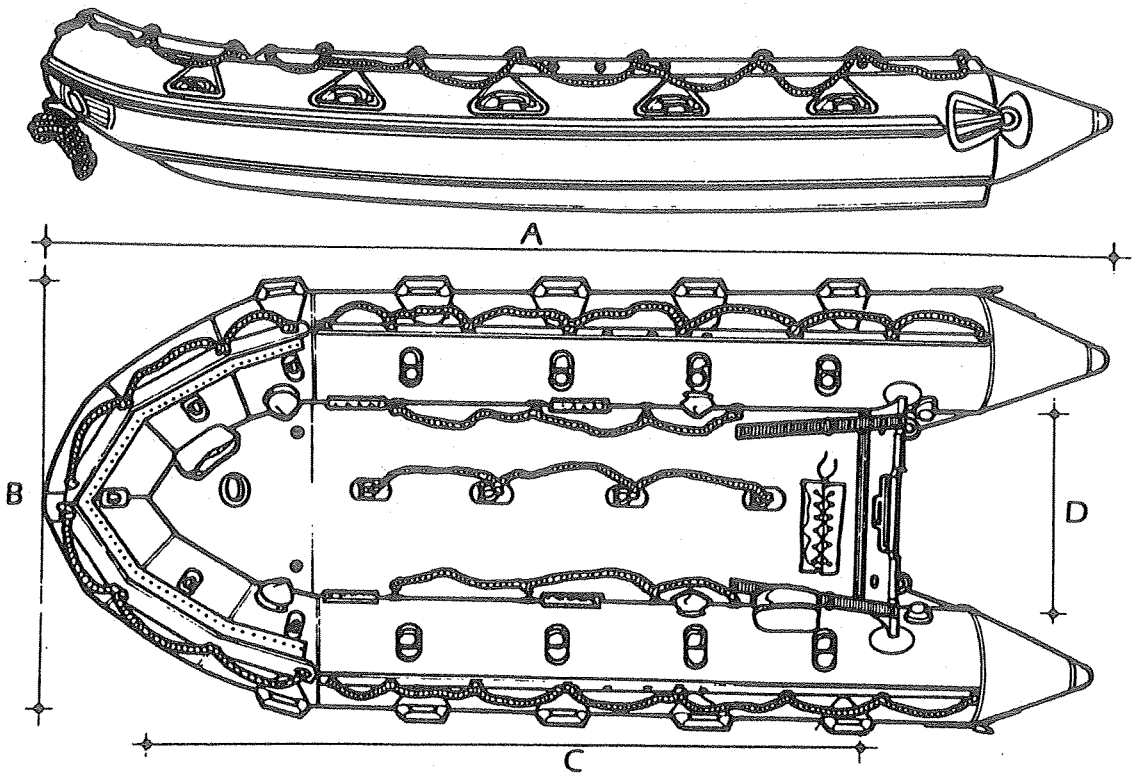
The F470 "Futura Hull" is the result of Zodiac's R&D department and brings a totally new performance capability to inflatable boats. The originality of this concept (Zodiac's patent pending) lies in adding two smaller inflatable shock-absorbing tubes to the main buoyancy tubes and linking them together with a shock-absorbing skirt.

This type of hull configuration has two main advantages: The shock-absorbing angle, α , which relates to the hull's penetration into the water, is narrower than on traditional hulls. The deeper "V" shape improves the directional stability of the boat and provides a more comfortable ride. The two shock-absorbing tubes also add rigidity to the hull

and help lift it on a plane quicker. Once planing, the handling is further enhanced by a tunnel-hull effect produced by the suction of air flowing beneath the hull between the smaller tubes. These tubes then act as rails under the boat giving the F470 "Futura Hull" exceptional maneuverability and responsiveness.

F-470

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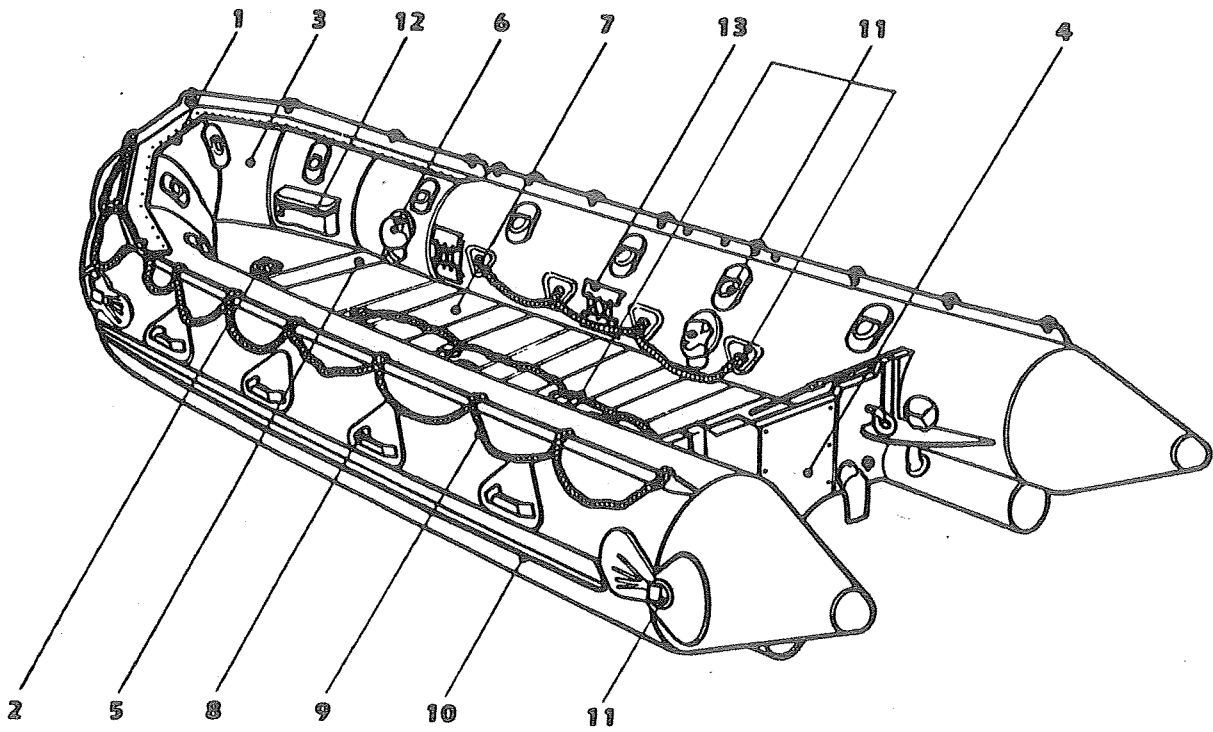


Specifications

Overall Length A	4.70 m	15'5"
Overall Width B	1.90 m	6'3"
Inside Length C	3.4 m	10'10"
Inside Width D	0.90 m	3'
Tube Diameter	0.50 m	20"
Maximum # of passengers	10-Men	10-Men
Maximum payload	1230 kg	2710 lbs
Maximum HP with standard slatted floor	40 HP short shaft	40 HP short shaft
Maximum HP with optional aluminum floor*	65 HP short shaft	65 HP short shaft
Dimensions in bag	1.50 x 0.75 m	59 x 29.5"
Weight with standard slatted floor	120 kg	265 lbs
Weight with optional aluminum floor*	120 kg	265 lbs
Number of air-tight chambers	5 + 2 + 1 = 8 chambers	5 + 2 + 1 = 8 chambers
Weight of CO ₂ charged bottle with manifold* U.S. D.O.T. approved	20.45 kg	45 lbs

*Optional Equipment

Fixed Standard Equipment



Fixed Standard Equipment

1 Hull

1 large diameter (0500 mm) black buoyancy tube, U-shaped, divided in five air-tight chambers.

2 black shock absorbancy tubes or speed skegs.

1 black bottom, reinforced at the center line by a wide black rubbing strake.

2 black rubbing strake reinforcements under shock absorbing tubes.

2 shock absorbing skirts linking skegs to main buoyancy tubes.

Total number of Airtight Chambers:

Main buoyancy tube — 5 chambers.

Inflatable keel — 1 chamber.

Shock absorbing speed skegs —

2 chambers when clamped off.

2 Keel

1 inflatable keel with metallic valve, valve cap and insert.

3 Hull Fabric

Heavy duty 1880 dtx polyamide coated with Hypalon Neoprene. This high resistant Nylon is coated with HY/NEO Compound on the exterior for chafing, UV, ozone, and mild acid resistance and Neo for superior air tight integrity on the inside. Method of assembly is Cold Vulcanization.

4 Transom

Multi-directional Sapelli, Marine Grade 24 ply at 90 degrees to each other, 30m/m thick; black polyurethane varnish (for short shaft engines).

2 large volume self bailer 'socks'.

2 launching wheel locating plates.

1 wooden pad on exterior.

1 metallic outboard engine motor mount, with engine safety ring.

2 retaining battens for floorboards.

2 transom bracing straps.

2 anti-splash triangles.

5 Thrust Board

Bow fixed ash thrust board equipped for lifting sling attachments. Black polyurethane varnish.

6 Valves

4 metal intercommunication overpressure release valves on main buoyancy tube with intercom closing position by rotation.

5 valve caps and inserts with membranes and thoroidal rings.

2 CO₂ Halky Roberts overpressure valves.

2 CO₂ valve base ready for CO₂ inflation canopy and bottle.

2 L-shaped elbows communication between main and lower buoyancy tubes equipped with metallic clamps. All valve bases, valve caps and valve inserts are metallic corrosion free.

7 Floorboards

1 roll-up rapid deployment ash slatted flooring covered by fabric. This is an integral part of the boat. Does not have to be installed or dismantled.

1 CO₂ lacing sheath for bottle.

8 Handles

1 bow metallic corrosion free carrying/mooring handle, with 14mm black nylon mooring line (not for towing).

10 heavy duty carrying handles — black spray deflecting — 5 port, 5 starboard.

9 Lifelines

14mm black nylon lifeline rove through lacing cuffs on top of main buoyancy tubes.

2 internal grab lines in 14mm black nylon inside of main buoyancy tube.

1 grab line mounted on 4 D 53 rings in middle of roll-up flooring.

10 Rubbing Strakes

1 wide, black ripple and tear-drop spray deflecting rubbing strake around entire main buoyancy tube.

2 rubbing strakes 60mm wide under speed tube skegs.

1 rubbing strake 60mm wide under keel of hull.

11 D Rings

4 heavy duty D 53 corrosion free towing rings on 300mm span supports — 2 on bow to be towed by and 2 on aft cones to tow with.

13 D 53 corrosion free rings inside lacing cuff — port, starboard, and one in bow.

4 D 53 corrosion free rings on roll-up floor with khaki nylon strap linking them together.

8 D 25 corrosion free rings on inside of buoyancy tube near floor, linked together with 14mm black nylon grab line.

4 on port and 4 on starboard.

12 Pouches

2 water resistant pouches with zippers — 1 starboard bow, 1 port stern.

13 Sheathes

4 sheathes designed to hold 6 sound-proof paddles.

Loose Standard Equipment

1 black carrying bag — rot resistant, containing:

6 black sound-proof paddles.

2 foot pumps and 2 hoses.

1 collapsible hand bailer.

1 repair kit.

1 pressure gauge.

Towing and hoisting materials —

2 heavy duty 53mm corrosion free ring bolts transom mounted.

1 heavy duty towing bridle.

1 heavy duty lifting sling.

The Zodiac Marine Commando

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10 Man Inflatable Craft

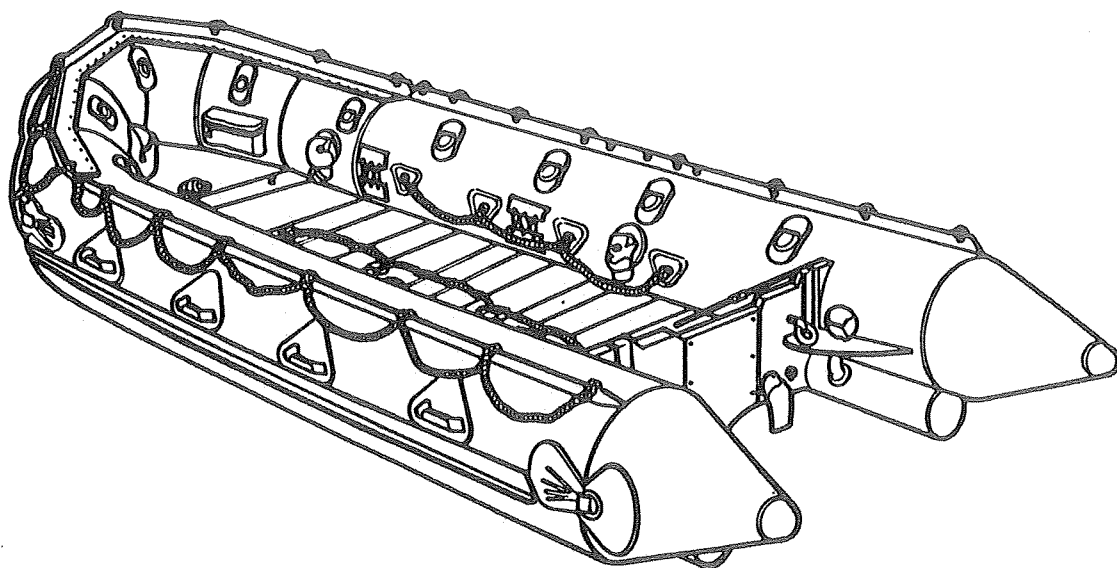
Section I – Operation



F470

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F470 NSN 1940-01-262-3993



Description

The F 470 is formed by:

An upper pontoon in Hypalon/Neoprene 1880 Dtex which comprises 5 airtight chambers.

Two shock absorbing tubes which can be inflated while inflating the main pontoon. One can isolate them with lower airchamber isolator clamps.

An inflatable keel which gives the ideal shape to the hull.

A transom in special marine plywood which supports the motor.

Two large self bailers.

A thrust board.

A fabric bow floor.

An integrated foldable wooden slat floor with a sheath for CO₂ bottle and transom straps.

Fixed Accessories:

2 pouches, 4 paddle sheathes.

Lifelines: external/internal and on the floor

4 D-rings on "butterfly supports",

13 D-53 rings, 10 carrying handles, and one bow carrying handle with mooring line.

1 wide rubbing strake around the hull.

Inflation system:

2 overpressure valves, 4 intercommunicating valves, 2 CO₂ inflation valves, 2 lower airchambers and isolator clamps.

Loose accessories:

6 paddles, 2 footpumps with hoses, 1 towing sling, 1 lifting sling.

1 repair kit with pressure gauge.

Options:

See page 57-58.

The Roll-up Floor

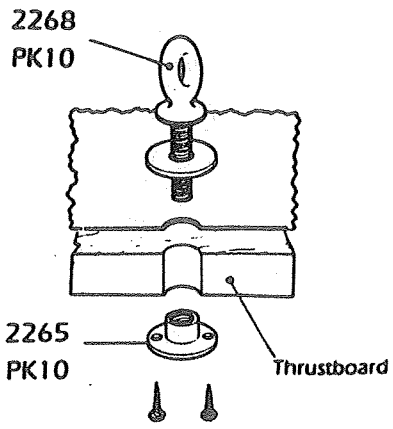
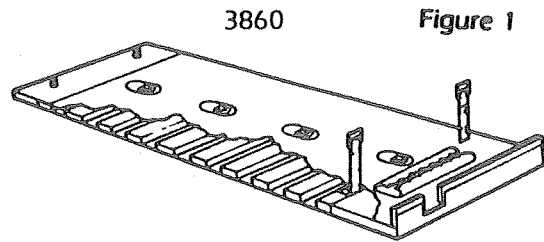


Figure 2

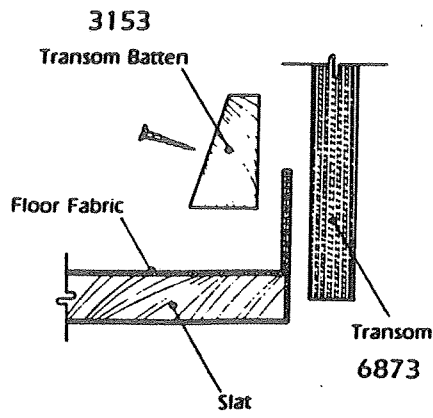


Figure 3

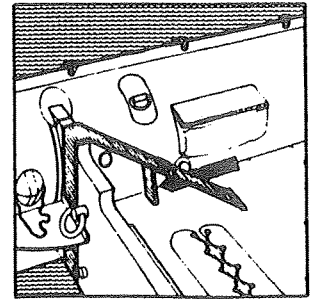


Figure 4

The Roll-up Floor

The slatted floorboard decking, arranged in a folding mat, is uniquely designed to enhance the rapid deployment concept, is completely removable and comes factory installed so that it rolls normally in with the fold of the boat. It is constructed as a single, mat type roll-up flooring system consisting of slats made from ashwood which are factory covered with wear proof fabrics and protective coatings. A lacing sheath is installed on the aft area of this floorboard section to secure a CO₂ cylinder should the boat be deployed with such a system.

It is fixed:

Forward: on the thrust board (Figure 2)

Aft: between the transom and the transom retaining batten (Figure 3)

It is adjusted:

On the transom: (Figure 4) by two tension straps from floor to transom (Figure 4). Tighten straps 1" past snug.

On the sides: by placing the floor under the rubber triangular extrusions glued to the bottom of pontoons on either sides of the transom inside the boat.

Optional Aluminum Floorboards

These floorboards do not allow the use of automatic inflation (refer to the assembly instruction delivered with the aluminum floor).

When the slatted floorboard decking is not preferred for use it is easily removed and as easily replaced with the optional aluminum floorboards. Aluminum floorboards are used when the use of the boat requires a higher

rate of speed, mobility and maneuverability, better helm controls through high sea conditions, as well as to result in achieving better fuel economy. The optional aluminum floorboards are made of lightweight AGS T6 anodized aluminum, are self locking and come in four panels and two securing aluminum stringers. With practical training the time required to install this flooring system can be reduced to only a few minutes.

Figure 1

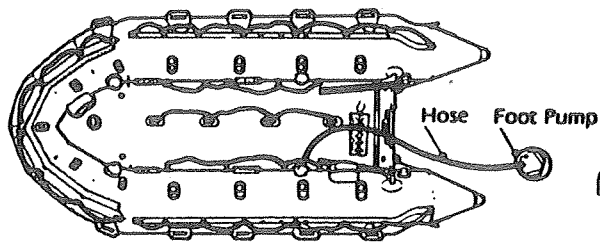


Figure 2

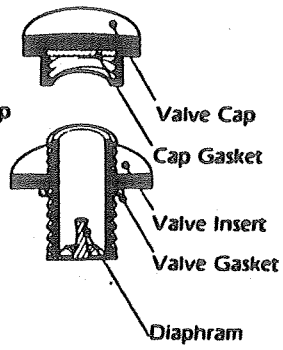


Figure 4

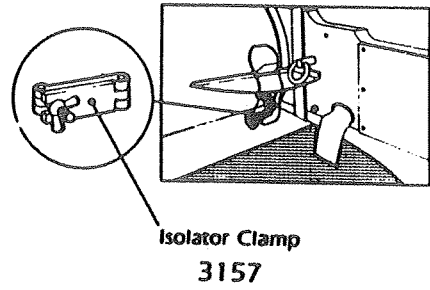
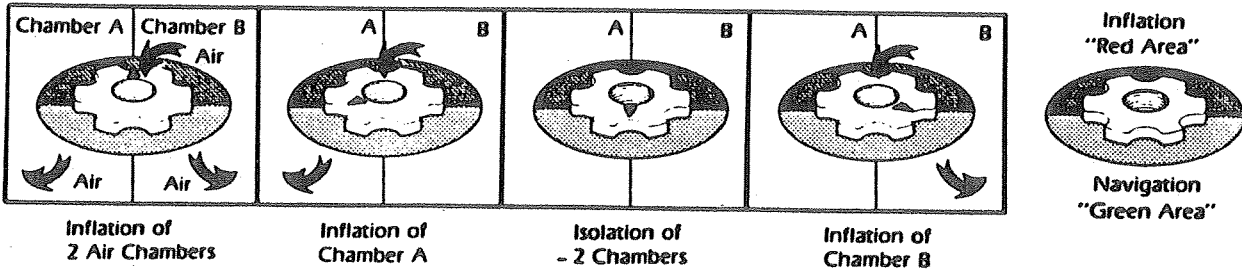


Figure 3



Assembly

Two Methods:

Manual Assembly.

Automatic Assembly (with CO₂ cylinder).

Manual Assembly

Open the bag, unroll the boat, and remove the accessories. While inflating make sure that: the roll-up floor is under the rubber extrusions, and transom tension straps are buckled (figure 1) loosely.

Manual Inflation System

It comprises:

The footpumps and hoses.

The valve caps and valve inserts.

(Valve inserts have a small diaphragm that will prevent air from rushing out, but permit a small leak. This is normal before the valve caps are tightened. The caps, with their washers, ensure total air tightness)(Figure 2).

Through the small diaphragm air leak, pressure readings can be

taken with the pressure gauge. The intercommunicating valves (Figure 3) function as gates to allow air to flow into each pressure chamber, then close to seal air pressure into its own respective chamber. This same valve system is engineered to sense overpressure build up in the air chambers. An overpressure release mechanism self-activates when the danger of overpressure build up is sensed and immediately releases the excess, avoiding any possibility of causing severe damage to the boat.

The lower airchamber isolator clamps ensure the air-tightness of the shock absorbing tubes.

Manual Inflation Procedure

Screw all valve inserts in their housing, and turn valve fly wheels to the inflation position ("red area").

Use the foot pumps smoothly,

without hurrying.

Inflate until the pump becomes difficult to press down with your foot.

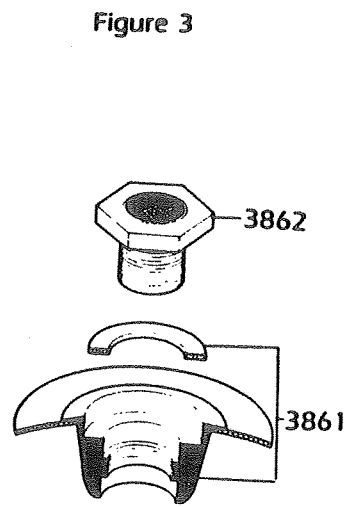
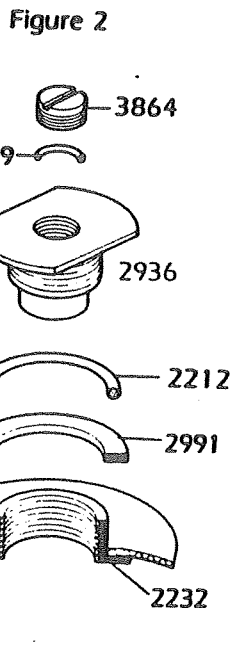
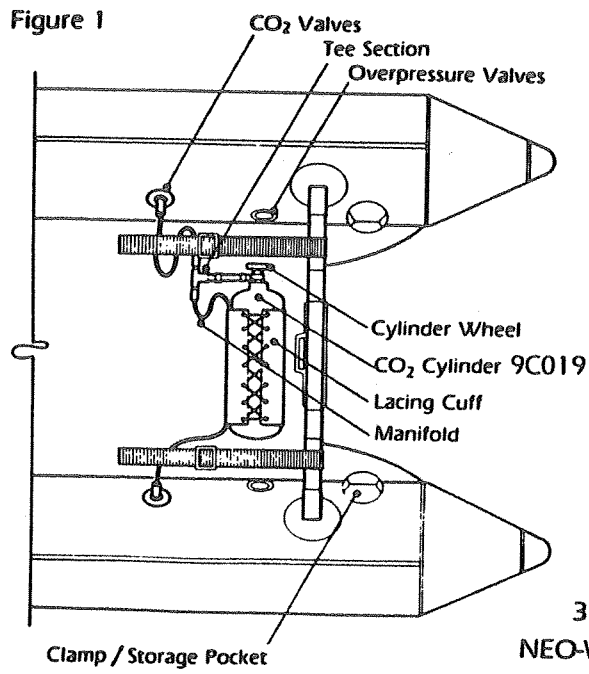
Screw on valve caps.

Inflate the keel (220 mb) and screw the valve cap on.

Check correct pressure with pressure gauge (Buoyancy tubes at 240 mb).

Isolate the shock absorbing tubes with the isolator clamps. (Figure 4)

Reset the valves in navigation position ("green area") thus isolating each chamber.



Assembly (continued)

Automatic Inflation (reference "CO₂ Cylinder")

Open the bag.

Check that folding instructions have been followed (intercommunication valves should be in inflation positions, (red area), so as to let the CO₂ circulate throughout the boat and that valve inserts and valve caps are in place.)

Turn the wheel of the CO₂ cylinder ¼ of a turn.

One CO₂ charged bottle is good for one inflation only.

Automatic Inflation System

It comprises:

2 CO₂ inflation non-return valves (Figure 1) port and starboard of transom.

2 overpressure valves (they allow the excess gas out) (Figure 3)

(Halkey Roberts).

4 intercommunicating valves.

All four intercommunicating valves

must be turned with their arrows to the inflation "red area" to allow the CO₂ to circulate throughout the boat. (To deflate the boat, valves should also be in this position and remove valve caps and inserts).

2 lower airchamber isolator clamps (Figure 3) ensure the isolation of shock absorption tubes. They are in 2 pockets on the outside of the transom. (Figure 1) Clamp Storage Pocket.

Optional:

1 inflation hose kit (2 ways) referred to as the manifold.

1 CO₂ cylinder: CO₂ load = 5 kg.
= 11 lbs. equipped with a manually operated valve.

Automatic Inflation Procedure

The boat inflates in 3 to 4 minutes at 70 degrees F. Do not prevent unfolding.

Monitor inflation of the boat by checking intercommunicating valves to ensure they are in the correct position.

Inflate the keel with the foot pump to air pressure level of 220mb.

Isolate the shock absorption tubes with the isolator clamps (see pg. 13, Figure 4) after the lower buoyancy tubes are at maximum air pressure.

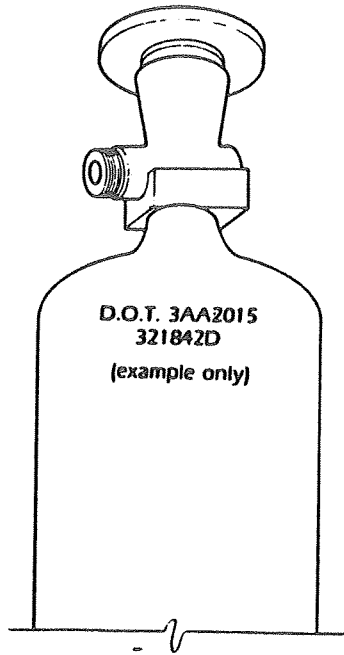
Turn arrow on wheel of each I/C valve to the 6 o'clock position as shown in figure 3, pg. 13.

The boat is now operational.

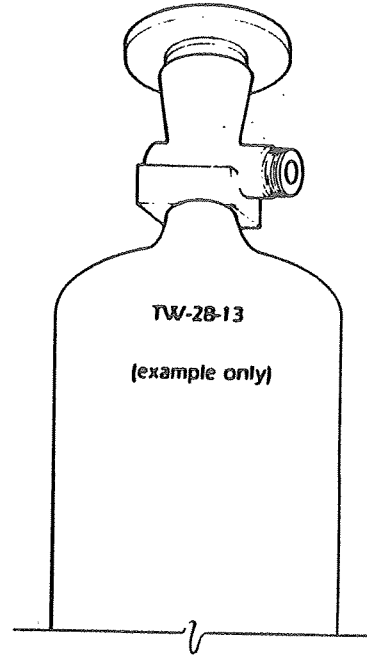


9C019

**D.O.T. Code
Stamped By Manufacturer**



**Tare Weight Code
Stamped By Manufacturer**



CO₂ Cylinder

The United States Department of Transportation requires the manufacturer to affix the Federal Control Code and the Tare Weight (TW) on the cylinder. This information is stamped on the upper shoulder of the bottle. The cylinder is subject to a hydrostatic test every 5 years, and must be decommissioned if the test is negative. The CO₂ bottles have a safety disk on the operation head. In the event of over pressure due to unusual ambient climatic conditions this disk ruptures, to discharge the cylinder, thus preventing any damage to same.

How to Check a Gas Cylinder

The Tare Weight (TW) is stamped on the bottle. Add 11 pounds (CO₂ charge) to this figure to determine gross weight of bottle and gas. A precision scale is needed to check actual weight. Weigh the cylinder with its operation head and compare with the previously determined weight. The acceptable tolerance is $\pm 5\%$ of gross weight.

CO₂ Inflation Hoses

Check for any cracks or cuts. If detected, change the hose. Change all gaskets after each CO₂ assembly.

General Recommendations**Deflation-Folding**

Clean the boat and let dry.
Pull the buoyancy tubes inwards.
Roll up the boat from the bow to the transom (the CO₂ cylinder sheath must remain accessible).
Install charged CO₂ cylinder.
Fold the cones onto the transom.
Put boat in its bag.

Very Important when using the CO₂ automatic Inflation system

When the boat is deflated, screw in the valve inserts and their caps into the intercommunicating valve. Set the intercommunicating valves in "inflation" position (red area) and position the valve covers. This is of the utmost importance. The CO₂ must run through the intercommunicating valves into the next chamber, and so on, so as to inflate chamber after chamber. If one of the I/C valves were to be closed (green area), the CO₂ will not inflate the whole boat. There also is a possibility of damaging the boat as a result of this.

Pressure

CAUTION: Never depart without your pump and pressure gauge. Do not navigate with an under-inflated boat. Pressure gives rigidity to your boat. Operating pressure must be maintained at 240 mbs for the tubes, 220 mbs for the keel. Pressure must be inspected frequently.

Changes in temperature influence pressure greatly. A variation of 1°C (1.8°F) results in a corresponding variation of ±3 mbs. Under operating conditions of maximum payload, maximum engine H.P. and rough seas, maximum pressure must be maintained for good performance of the boat. Incorrect pressure will also reduce the life expectancy of your boat.

General Recommendations (continued)

Maintenance

ZODIAC boats are rot-proof. They require simple maintenance however, essential for long life expectancy.

After each use:

Rinse with fresh water, then carefully remove sand and various debris inside the boat. Carefully clean the boat between the bottom and shock absorption tubes. Stand the boat upright on its cones against a wall or suspend it; carefully rinse with fresh water between the main pontoon and the shock absorption tubes. Then deflate the lower tubes, allow to dry, and remove any remaining sand and or debris. Check and clean all metallic parts. Leave boat to dry. Repack in the bag.

Every 6 months:

Perform the pressure test, i.e.: Inflate the buoyancy tube to 300 mbs (Pressure gauge needle pointing to 3 o'clock).

Screw the valve caps on.

Check the air-tightness of the inflation points with a soap and water solution.

Stabilize the pressure for half an hour and record the ambient temperature.

Reset pressure at 240 mbs.

Separate the compartments (valves in "navigation" position, green area), and clamp the lower air-chambers to isolate them. Take the pressure reading after 5 hours: correct any variation in pressure in proportion to the temperature variation. Add or subtract to the recorded ambient temperature 3 mbs for every 1.8°F increase or decrease shown on the pressure

gauge. Only deal with pressure drops greater than 4 mbs per hour (i.e., 20 mb for 5 hours). Check and grease the intercommunicating valves with marine type grease (Shell Retinax A, or similar). Paint the wooden parts (polyurethane paint or varnish) after having sanded them down. Check the Halkey Roberts over-pressure valves as well as the CO₂ 'T' manifold and pressure hoses for abrasion, cracks or any suspect problems.

General Recommendations (continued)

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Navigation

The boat must be correctly inflated: 240 mbs.

The outboard motor must be properly positioned, with a short shaft (The motor should align with the central axis of the boat).

Secure the engine with a rope to the safety loop of the metallic transom plate.

The adjusting of the angle of the motor in relation to the transom is essential for obtaining the best performance from your boat.

The boat will porpoise if the motor is too far out from the transom.

The boat will buckle if the motor is too far into the transom.

The height of the outboard motor also affects the boat's performance (water through the clamps, cavitation).

The clamps should be securely tightened by hand and retightened after 15 minutes of running.

The choice of the propellor also is important.

The engine cavitation plate should be a full inch under the water line.

A circuit breaker line is highly recommended to avoid possible accidents. It should be attached to the pilot. In case of his separation from a moving boat the line will disconnect the circuit breaker and shut off the engine.

Do not let gasoline spill in the boat.

Load Distribution

The maximum payload is greater than planing payload of the boat. In heavy seas from the bow: load the bow of the boat.

In heavy seas from the stern: load the stern of the boat.

Towing

Never use the bow carrying handle for towing, but use the 2 D-rings on each side of the bow, and attach the towing sling provided as standard equipment. For best performance while towing, cross towing lines, port to starboard and starboard to port.

Lifting

To lift the boat in the air with lifting sling (standard equipment) use the 2 eye bolts of the thrust board and the 2 eye bolts in the transom.

The Zodiac Marine Commando

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10 Man Inflatable Craft

Section II – Repairs



Repairs

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General

Repairs must be performed under the following conditions:

Hygrometry: no greater than 75% R.H.

Temperature range: between 19 degrees C and 25 degrees C = 60 degrees F to 80 degrees F. (approximately).

Avoid carrying out repairs in direct sunlight or in rain.

Preparation of surface to be glued:

Cut a round patch about 3 inches larger than the tear, in every direction.

Trace the position of the patch on the boat.

Scuff the area and the patch, deep enough but without uncovering the nylon substraight. For Strongan/Dynalon refer Note: below.

NOTE: Strongan/Dynalon
Do not scuff these materials!

It is advisable, however, to lightly roughen the Strongan or Dynalon surfaces with fine grit sand paper manually. The object is to break a film which forms due to ozone or to shelflife. After this operation, you will use the solvent and glue as explained later.

Clean with solvent MEK (methyl ethyl ketone).

Three coatings of MEK solvent will be applied to both surfaces whether they are Elastomers — Plastomers — or a combination of both types.

The first coating, to clean the surfaces thoroughly, the second and third to soften the surfaces and prepare it to receive the glue.

A five minute drying time is required between each MEK application.

Repairs (continued)

Glue

Polyurethane Base Glue:
The following is the glueing chronology to be used with polyurethane type glue — code 7096 in 800 cc. can.

Brushes

All coatings are to be made with a hard paint brush with natural hair (silk or boar). It is important that the brush hair be metal bound and not plastic bound and the handle be preferably wooden to prevent contamination of the glue. The hair length should be less than 1 inch long and 2 inches wide.

Note

If you have not assembled the parts and boned them down within 10 minutes, you must reactivate both surfaces with MEK. This is done with a thoroughly soaked clean rag or tissue paper. Do not rub off the glued surface, but just wet it. When reactivating, you must not wait for the usual drying time, but assemble immediately. It is of the highest importance that you time this operation and bone down vigorously.

Glueing Sequence

Solvent			Glue			Assembly
MEK	MEK	MEK	7096	7096	7096	
5 min.	5 min.	5 min.	5 min.	5 min.	10 min.	10 min.

Repairs (continued)**Heat and Relative Humidity**

Heat and relative humidity control while glueing is also most important. The parameters are as follows:

18 to 25 degrees Celsius and not more than 75% of R.H./60 to 80 degrees F.

Do not experiment with these parameters as the bonding qualities will drop drastically.

Glazing or Blushing

You will recognize glazing when the glue turns white. It rarely goes white all over the patch, but only in certain spots. This is due to two main reasons: A) You have spread your glue too thickly, and therefore, the 5 minute open time is not enough to let the solvents in the glue dry; you have actually trapped the solvents between the glue layers.

B) A rapid temperature drop has occurred during the open time or more likely the R.H. is not below 75%. Generally, it occurs when someone opens a door and a fresh gust of air (hotter or colder) comes in and blows over the patch. A few seconds are enough to "seize" the glue. What really occurs is that a microscopically thin layer of water due to condensation settles over the patch. (It is possible to glaze these surfaces by merely breathing on them!) You must reactivate with MEK rather than spread a fourth layer of glue, and assemble immediately.

Multipurpose Glue Code Number

To be mixed with its accelerator at 5% in volume.

Code 7096 — 800 cc with corresponding accelerator (two part glue).

The 800 cc code 7096 is graduated horizontally on the can. These horizontal lines correspond to $\frac{1}{3}$ of the can's contents to be used with one dose of accelerator. Do not use accelerator that has been left unused overnight. Throw it away.

Repairs (continued)

Cleaning

When you have finished glueing, put the brushes in a pot filled with ethyl acetate.

Do not use MEK because the brushes will dry and become stiff. Do not use Toluene either as Toluene does not "degrease" the glue from the brush.

CAUTION: One should not smoke in the repair area! MEK and ethyl acetate have very low flash points. If you splash accelerator on your hands, wash immediately with soap and water. If you have splashed it in your eyes, immediately wash with abundant water during 1 or 2 minutes and consult a physician. Accelerator is an isocyanate based liquid.

Shelf Life

Glue:

Store between 5 degrees C and 30 degrees C. (41°F and 86°F)

Accelerator: do not stock in direct light or humid conditions.

1 year shelf life if not opened; do not reuse once opened (throw away.)

Glue:

1 year shelf life if can has not been opened; 6 months if can has been opened and properly closed.

Pot Life

Multipurpose based glue has a 90 minute pot life after which it must be thrown away.

Between coats close pot with cover.

Repairs (continued)**Plastomer Parts (molded)**

In order to achieve an optimum bonding of these parts to the boat they should be heated in an "oven".

You can easily make one with a large cardboard box (4' x 2' x 2') and a hot air gun inserted into a hole in the box bottom. When in use place the parts within the box so as not to come in contact with the hot air gun.

Preparation/Glueing Sequence**Step 1**

Clean both part and matching area of boat with MEK. Wait 5 minutes.

Step 2

Repeat step 1, wait 5 minutes.

Step 3

Repeat step 2 then place part immediately in oven.

Step 4

Heat part at 60°C (140°F) for 15 minutes.

Step 5

Remove part from oven and apply 7096 glue to it and matching area of boat. Wait 5 minutes.

Step 6

Repeat glueing as in step 5, wait 5 minutes.

Step 7

Repeat glueing as in step 5, wait 10 minutes.

Step 8

Position part on boat, do not press until properly aligned. Thoroughly smooth the part against the boat with a rounded object, starting at the center and working outwards. Note: If assembly of a part to the boat cannot be made within a 10 minute period, due to the size of the part, you must reactivate the glue with MEK assembling as you go.

Curing Time:

For small repairs do not use the boat for at least 24 hours. For structural repairs do not use the boat for at least 48 hours.

Zodiac Boat Repair Training Program

5 Day Course

This program will consist of a 500 slide presentation divided into three main chapters.

2 Days —

Theoretical Training

Slides with comments and explanations

3 Days —

Hands On — Actual Physical Repairs

Theoretical training includes fabrics, substrates, fibers, glues and how to use them, work shop atmospherical controls, heat and RH, and general methodology of repairs.

The slide presentation covers practically every aspect of preventive maintenance, field repairs, and in-shop repairs.

Main topics:

The repair shop

Special tools

Engine positioning

Tests and verification of boats

Pressure tests

Leak tests

Typical hull, bottom, and flooring repairs

Repair or exchange of standard parts on the boat.

Three days of practical exercises consisting of hands-on repairs to boats putting into practice the above instructions.

For information on repair course, tuition, and location please contact:

Grahame Smith

Operations Manager

61 (2) 743-1306

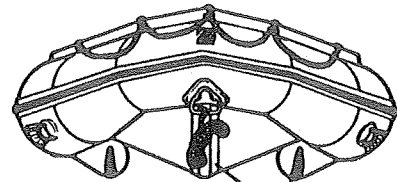
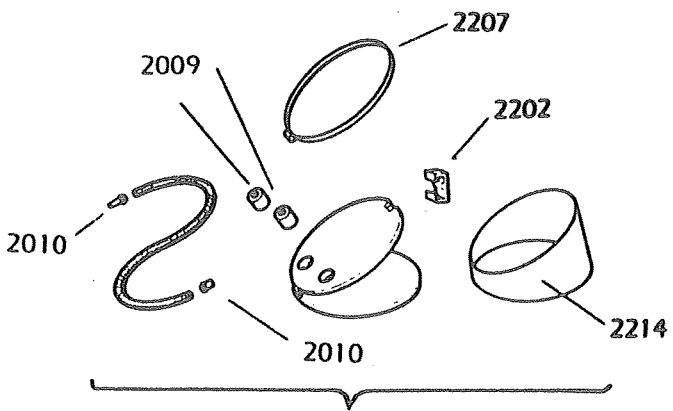
The Zodiac Marine Commando

F470

10 Man Inflatable Craft

**Section III — Repair,
Replacement and Optional
Parts, Equipment
and Supplies.**

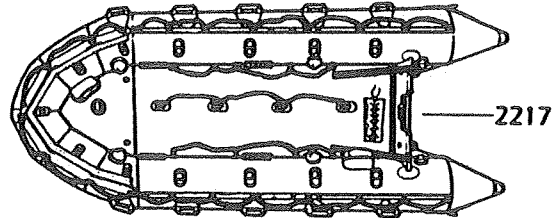
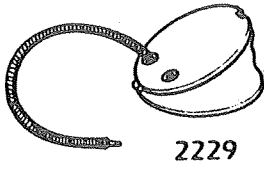




KEELSON NEO

~~2198~~

2198



2217

Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part I — Boat Parts

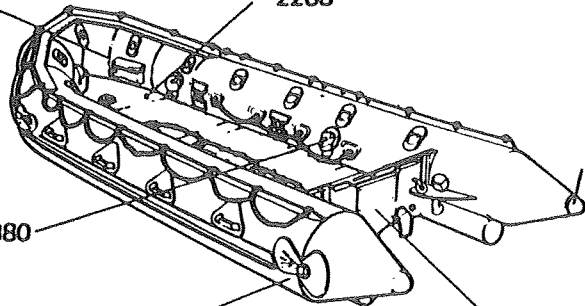
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2009	Valve, inflation foot pump per 5	Pk	0	.25	0
2009	Valve, deflation foot pump per 5	PK	0	.25	0
2010	Hose tip, pump & boat side per 5	Pk	0	.25	0
2073	Keel Strip, 60mmx3mmx11.5 mtrs	10.5mtrs	0	.50	0 - 2198
2202	Clamp bellows pump, per 20	Pk	0	.25	0
2207	Collar tightening for pump, per 2	Pr	0	.25	0
2214	Sleeve material, foot pump, per 2	Pr	0	.25	0
2217	Plate, ob motor mount alum.	Ea	0	.20	0

2219



2875 NEO

2268

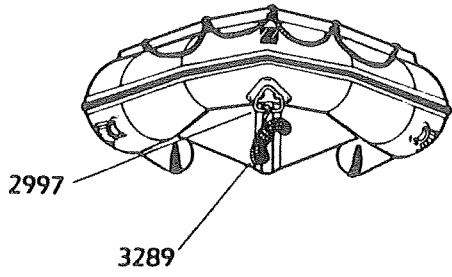


2600 NEO

2880

2576

3793

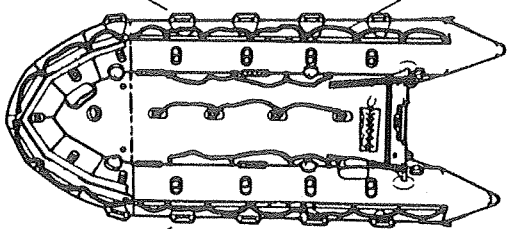


2997

3289

2995

3289

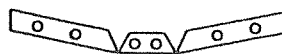
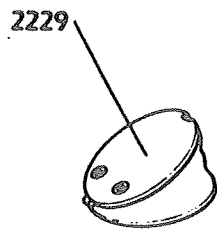


2994

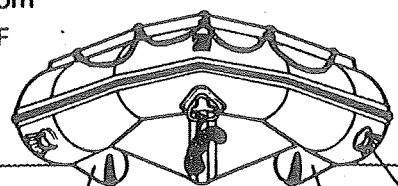
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part I — Boat Parts Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2219	Hose, pump comp.	Ea	0	.25	0
2268	Eye bolt thrust board per 10	Pk	0	.25	*
3793	Pad, transom wood	Ea	0	.25	0
2576	Ring, towing D53 heavy duty	Ea	0	.25	.50
2880	Cover, I/C valve per 10	Pk	0	.20	*
2994	Handle Carry Stbd	Ea	0	.20	*
2995	Handle Carry Port	Ea	0	.20	*
2997	Handle Carry Bow	Ea	0	.20	*
3289	Rope 14mm black lifeline 25m Lgth	Ea	0	.25	*
3289	Mooring line bow	Ea	.25	*	0
2875	Pouch equipment velcro NEO black	Ea	0	.25	*



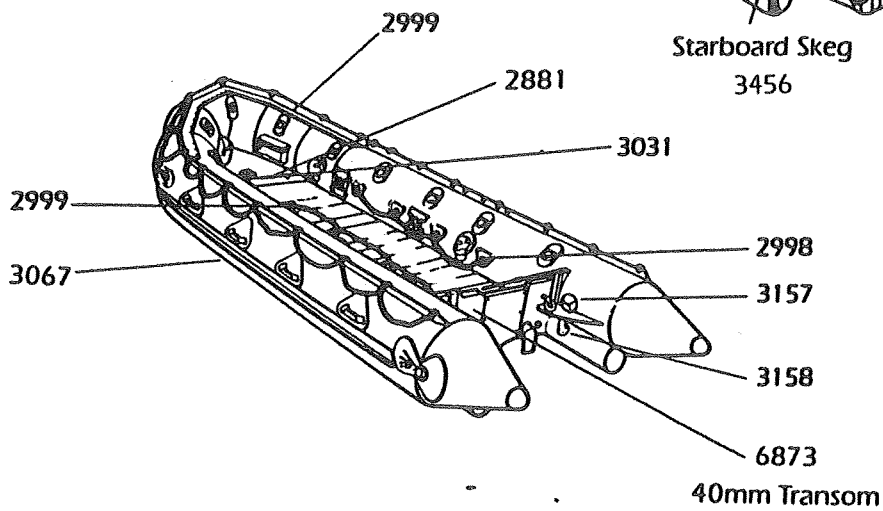
2253
GR Type Transom
CRESS HOOF



Starboard Skeg
3456

Port Skeg
3445

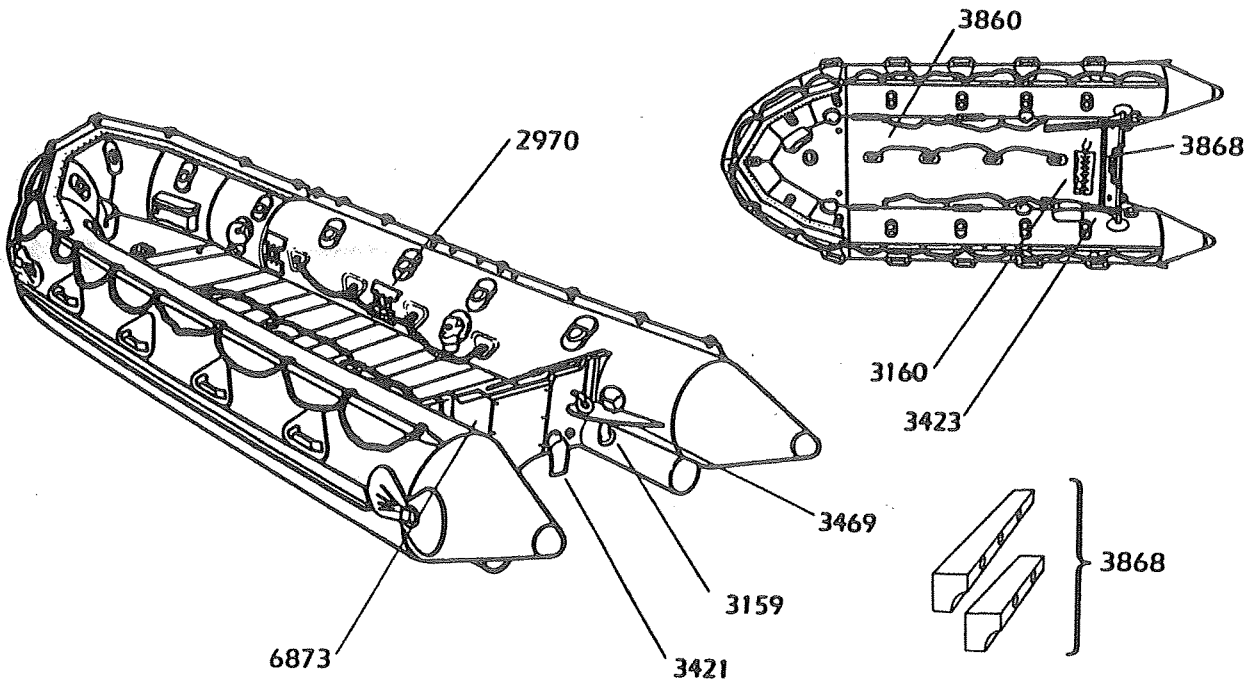
2576



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part I — Boat Parts Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
3067	Strake, boat rubbing 11 meters NEO	Ea	0	.50	*
2229	Foot Pump Complete	Ea	1	2	2
2998	D-Ring, D25, use per 5	Pk	0	.25	.50
2999	D-Ring, D53 use per 2	Pr	0	.25	1
2881	Thrust Board NEO	Ea	0	*	*
2051 3038	Keel, Inflatable Strongan	Ea	0	0	* <i>HYPAION keel</i>
6873	Transom	Ea	0	0	*
3157 3187	Clamp, metal lower tube	Ea	0	2	*
3867 3158	Elbow, lower tube inflation per	Ea 4 elbows 8 inserts }	0	2	*
			also needs O rings 2212 discount glue 8 use electircal tie wraps		
3038	Keel, Inflatable NEO	Ea	0	0	*



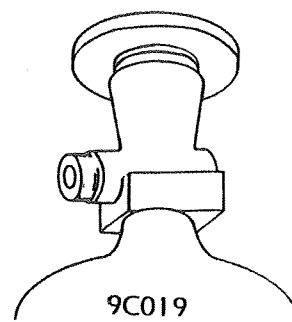
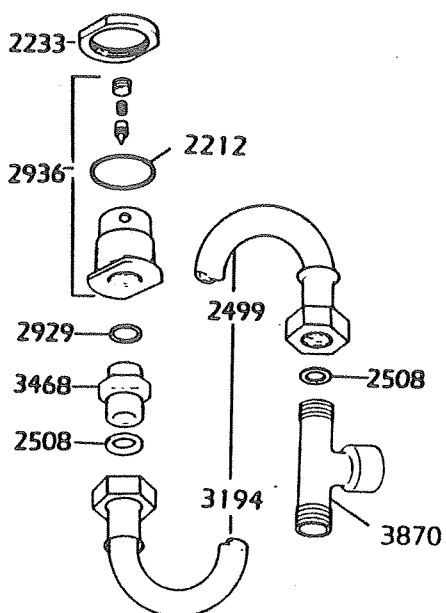
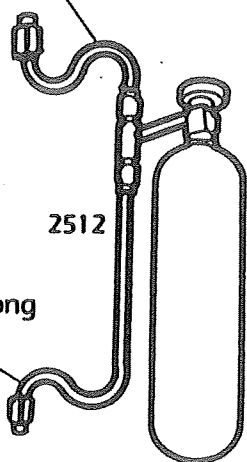
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part I — Boat Parts Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2970	Paddle Sheath	Pr	0	.25	*
6873	Transom 40mm	Ea	0	12.5	*
3868	Batten Floor (2 pieces)	Pr	0	.25	*
3154	Roll-up floor wood	Ea	0	.25	*
3159	Collar-Nut, metal elbow per 2	Pr	0	.25	*
3160	Sheath CO ₂ cyclinder	Ea	0	*	*
3421	Self-bailer sock type	Pr	0	.25	*
3423	Transom strap Blk	Ea	0	1	*
3469	Triangular anti- spray flap	Pr		.25	*
3874	Batten fixation kit CRESS through bolt in transom, pk5 (for 2 boats)	Ø 6mm length 45mm thread 1mm Hex 10mm + Washer			
3860	Alu roll-up floorboards				



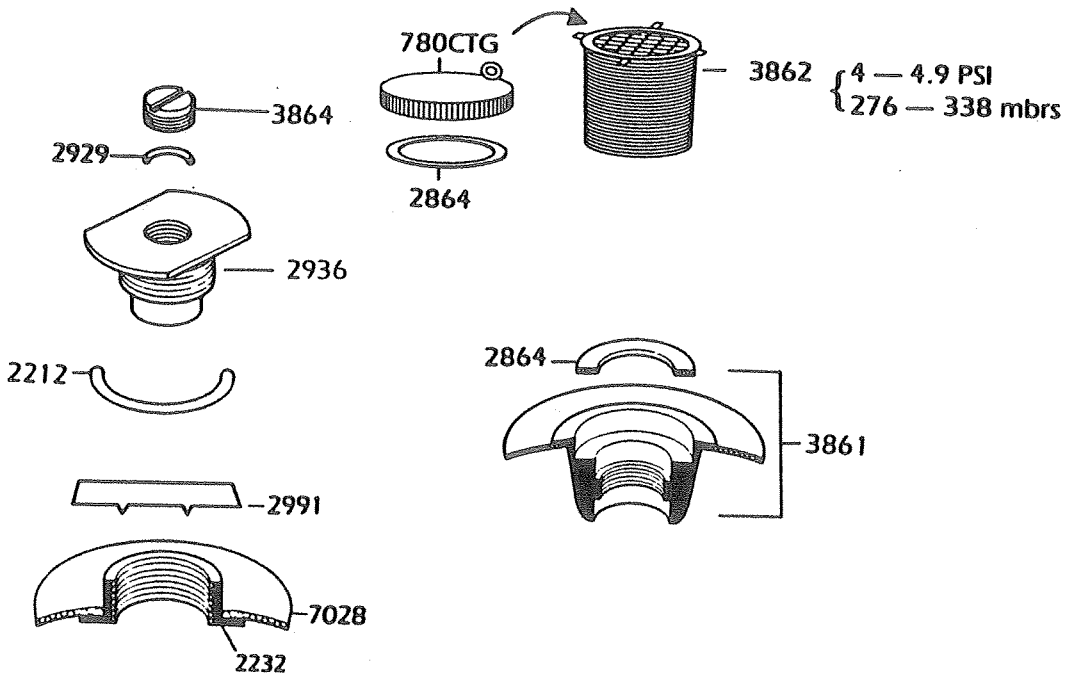
hose
Starboard short
2499



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part II -- CO₂ Inflation System Parts

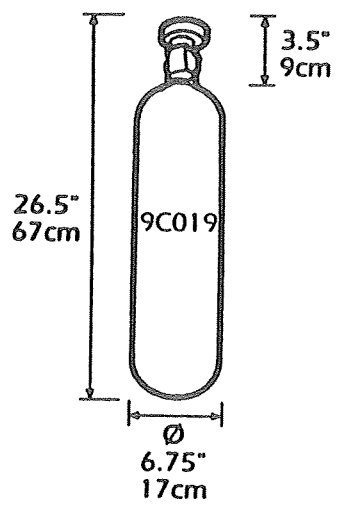
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2233	Nut, valve insert base per 10	Ea	0	.50	*
2234	Gasket, valve insert base CO ₂ per Pk of 10	Pk	0	.50	*
2499	Hose, inflation CO ₂ short	Ea	0	.50	*
3194	Hose, CO ₂ inflation long	Ea	0	.50	*
2508	Gasket, for inflation hose per 10	Pk	0	.50	*
2929	O-Ring for base valve insert CO ₂ per 10	Pk	0	.50	*
2936	Base, valve insert CO ₂	Ea	0	.50	*
3468	Coupling Kit	Ea	0	.50	*
3870	" Fitting 2 Port	Ea	0	.50	*



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

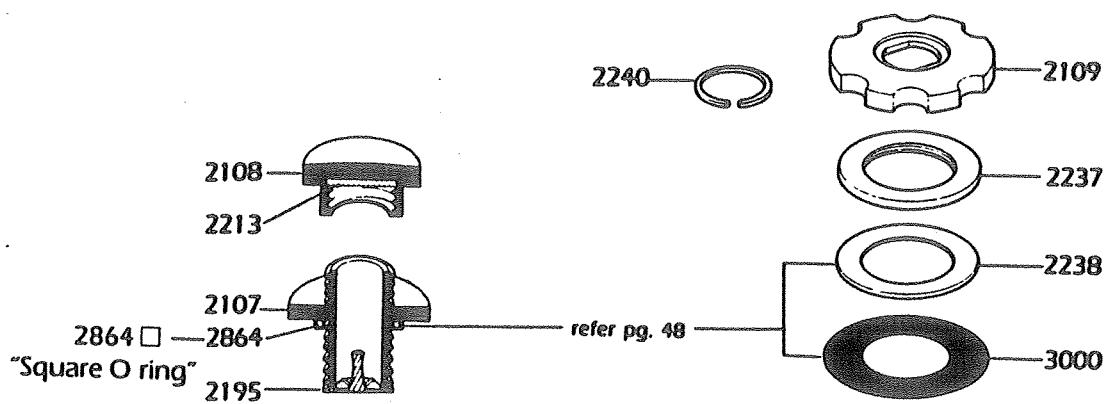
Part II — CO₂ Inflation System Parts Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2232	CO ₂ Through Hull Base	Pr	0	.50	*
2929	O-Ring for base valve insert CO ₂ per 10	Pk	0	.50	*
2991	Neo Gasket for PN 2232 per 10	Pk	0	.50	*
3864	Plug, blank CO ₂ Nylon	Pk 10	0	.50	*
3862	Halky Roberts over-pressure valve	Pr	0	1	*
3861	Halky Roberts Neo through hull base	Ea	0	*	*
7028	HY/NEO Fabric 1880 DTX	*	*	*	*



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)**Part II — CO₂ Inflation System Parts Continued**

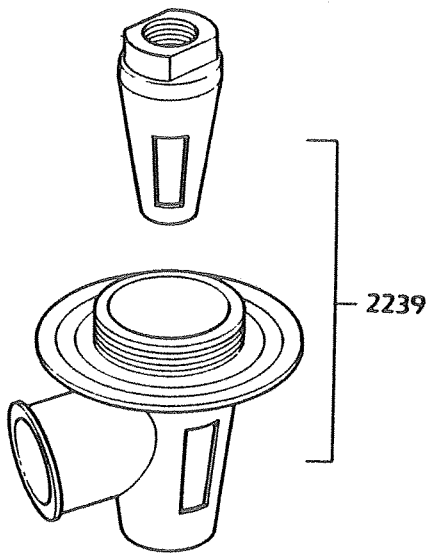
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
9C019	Cylinder 15 lbs charged with 11 lbs Bottle complete (without manifold)	Ea	0	*	*



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)**Part III — Intercommunication (I/C) Valve Parts**

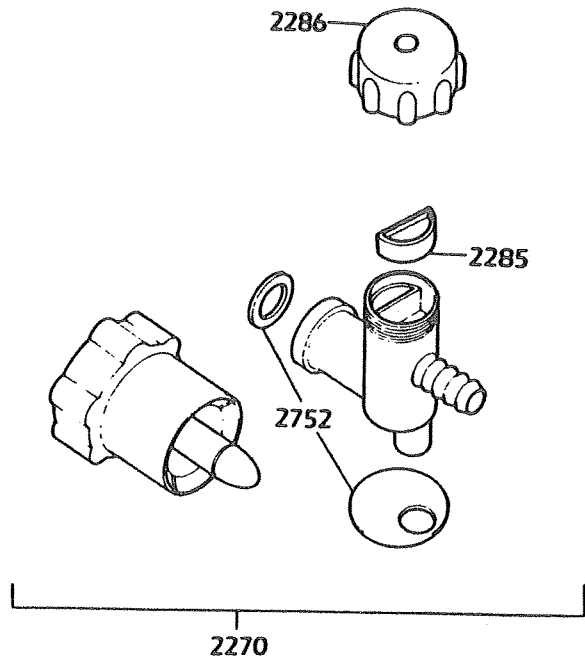
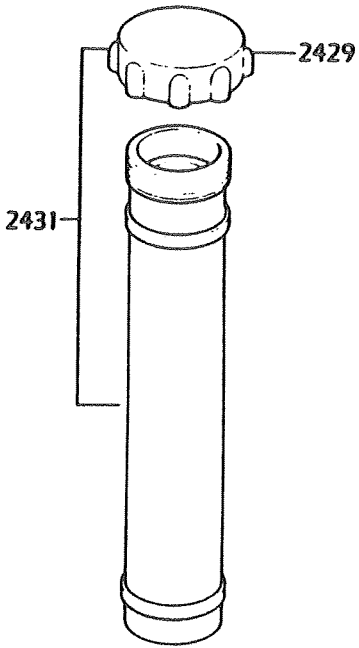
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2107	Valve insert, metal per 10	Pk	0	.50	.50
2108	Valve cap metal, per 10	Pk	0	.50	.50
2109	Nickel plated fly wheel	Pk	0	.25	.20
2195	Membrane, valve insert per 25	Pk	0	.50	.50
2213	Gasket valve cap per 10	Pk	0	.50	.50
2237	Nut I/C base per 10	Pk	0	.50	.50

- 2208
- 2236
- 2210



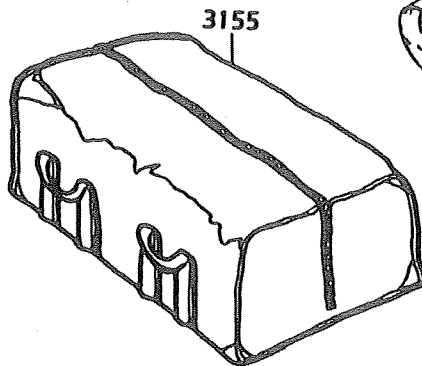
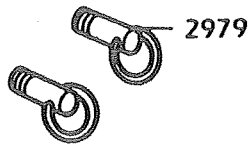
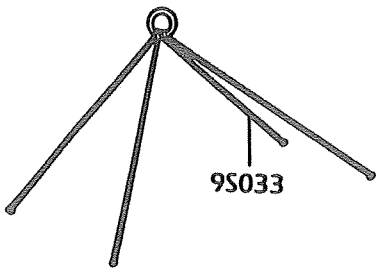
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)**Part III — Intercommunication (I/C) Valve Parts Continued**

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2208	Lock nut I/C 10 mm per 10	Pk	0	.50	.50
2210	Spring I/C per 10	Pk	0	.50	.50
2236	Gasket cap spring per 10	Pk	0	.50	.50
2238	Washer I/C valve per 10	Pk	0	.50	.25
2239	Valve, I/C compl	Ea	0	.25	*
2240	Cir Clip I/C per 10	Pk	0	.50	.25
2864	Flat Gasket Metal Valve Insert per 10	Pk	0	.50	.25
3000	Gasket I/C per 25	Pk	0	.50	.25

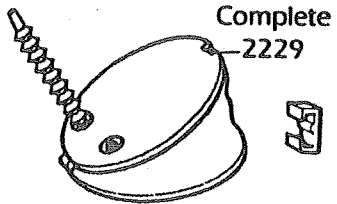


Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)**Part IV — Fuel Tank Parts**

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2270	Valve Assy. Compl.	Ea	0	*	*
2285	Filter	Ea	0	.50	0
2286	Valve Cap (Pk 10)	Pk	0	.50	0
2429	Filler Cap (Pk 10)	Pk	0	.50	0
2431	Hose Complete	Ea	0	.50	0
2752	Gasket Kit	Ea	0	.50	0



3123 Black
1129 Gray
Sound proof

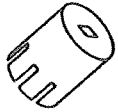
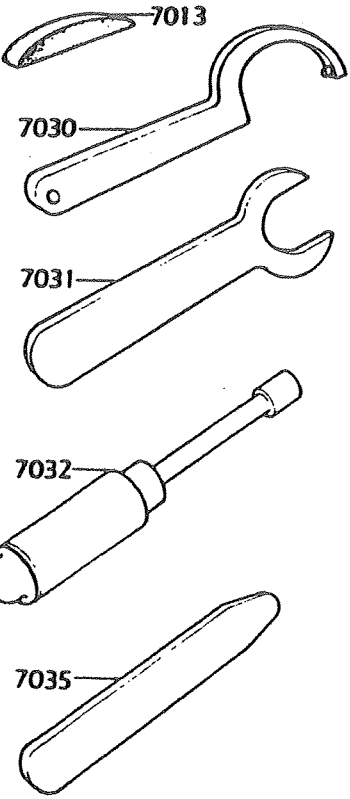


Kaki or OD green
3863
Ash wood

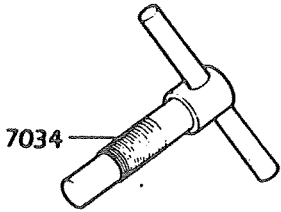
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part V — Standard Equipment

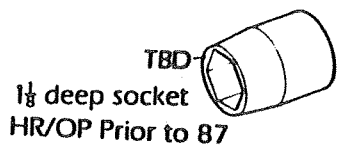
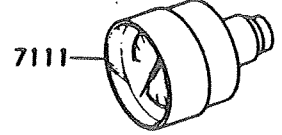
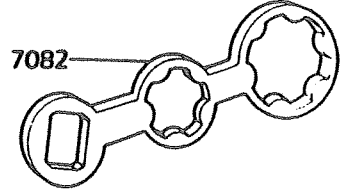
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
9G004	Pressure Gauge	Ea	1	3	3
2229	Pump, Foot	Ea	1	2	2
2966	Eyebolts, transom, diam. 3", for lifting and pulling, 2 per boat	Pk	0	1	*
2973	Sling, towing w/ attachments, per boat	Ea	1	1	1
3123	Paddle Soundproof Black, 1129 Gray	Ea	1	0	0
3155	Bag Carrying	Ea	1	0	0
9S033	Sling, lifting w/attachments Blk per boat	Ea	1	*	*
3863	OD green Ash wood	Ea	6	12	18



P/N - T780 SWP
HR/OP Valve extractor plastic. for 3862 HR/OP Valve



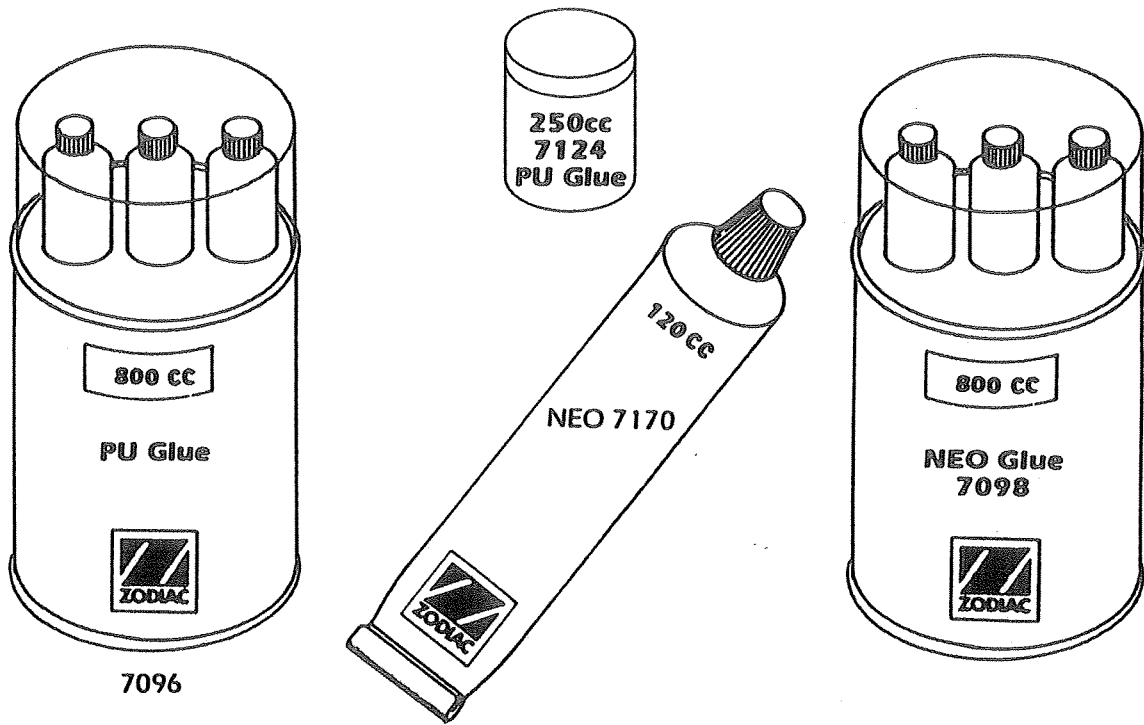
7106 Silver pens



Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part VI — Special Tools

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
7013	Pumice Stone (10)	Pk	0	3	2
7030	Spanner half moon	Ea	0	3	2
7031	Spanner, for collar nut	Ea	0	3	2
7032	Wrench 10 mm deep socket spanner	Ea	0	3	2
7034	I/C Extractor	Ea	0	3	2
7035	Boner blunt edge metallic	Ea	0	3	2
7082	Spanner fly wheel	Ea	0	3	2
7111	Pressure Gauge, screw on	Ea	0	3	2
TBD	Socket deep 1-1/8 for Halky Roberts overpressure valve	Ea	0	3	2
T780 SPW	HR/OP valve extractor	Ea	0	3	2
TBD — to be determined					



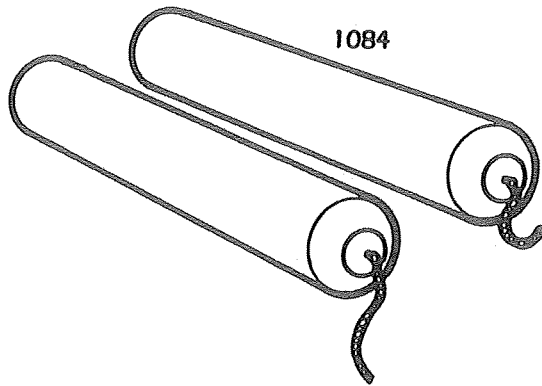
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)**Part VII — Shop Stocks**

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
6742	Repair Kit	Ea	1	0	0
7028 NI	Fabric hull 1880 dtx Blk per 1/meter	Me	0	10	5
7046 NI	Fabric general hull repair 940 dtx Blk per 1/meter	Me	0	15	15
7096	Glue multipurpose in 800cc container w/accelerator	Ea	0	25	25
7170	Glue field repair in 120cc tubes per 5	Pk	24	0	0

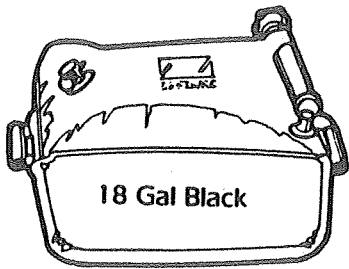
NI — not illustrated



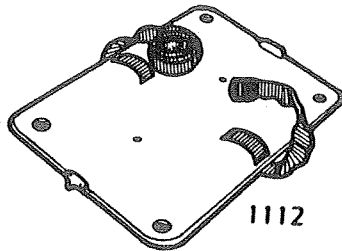
1198



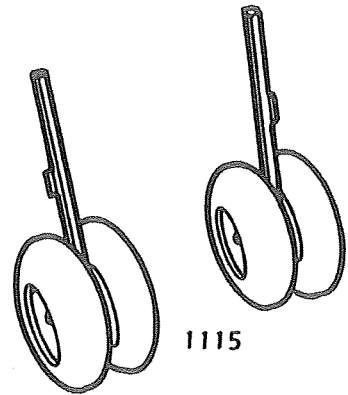
1084



1199



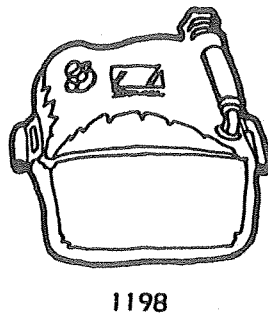
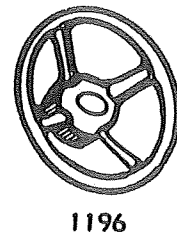
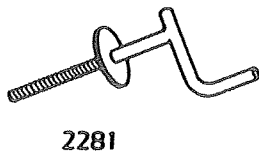
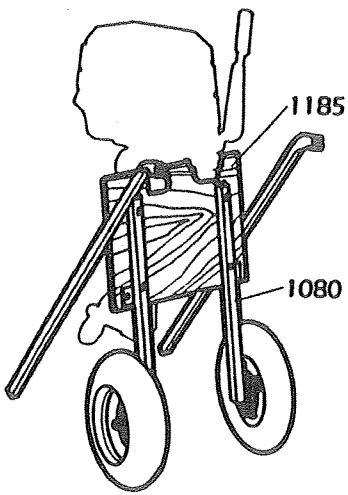
1112



1115

Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)
Part VIII – Optional Accessories

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
1198	Fuel Tank, 9 Gal Cap, collapsible, Red, per boat min.	Ea	1	0	0
1199	Fuel Tank, 18 Gal Cap, collapsible Red, per boat min.	Ea	1	0	0
1084	Roller, launching inflatable for ramp vessels or rocky beach areas per boat	Ea	2	0	0
1112	Support, for rigid fuel tank (use on Alumn FLBD)	Ea	2	0	0
1115	Jumbo launch wheels transom mounted (set of 2 wheels & attachments	Pr	1	0	0



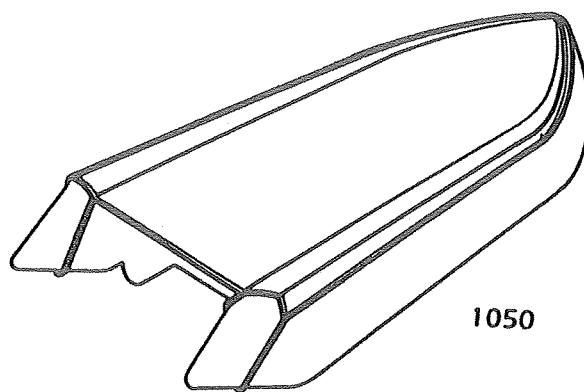
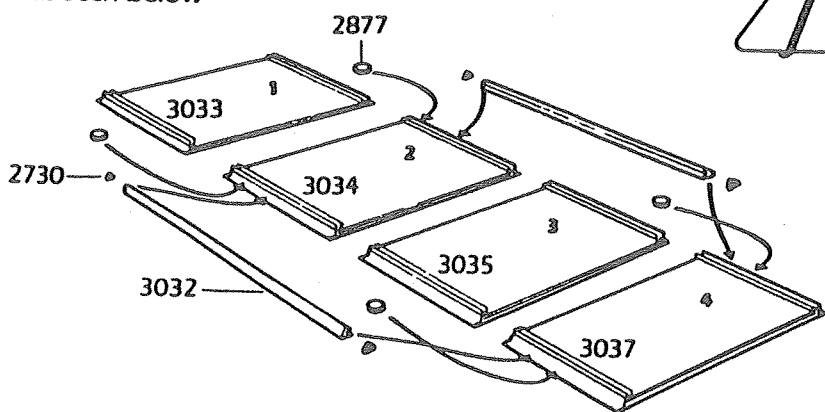
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part VIII — Optional Accessories Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
1080	Standard launching wheels for outboard trolley 1185	Pr	1	0	0
1185	Trolley only, outboard engine for use w/o 1080 launch wheels	Ea	1	0	0
1195 NI	Screws for Kit fixation (per 4)	Pk	2	0	0
1196	Steering Wheel w/Logo	Ea	*	0	0
1197 NI	Zodiac logo for steering wheel (per 10)	Pk	*	0	0
1198	Fuel Tank, 9 Gal Cap, collapsible Blk, per boat min.	Ea	1	0	0
2281	Launching wheel turn key	Ea	1	0	0

NI — not illustrated

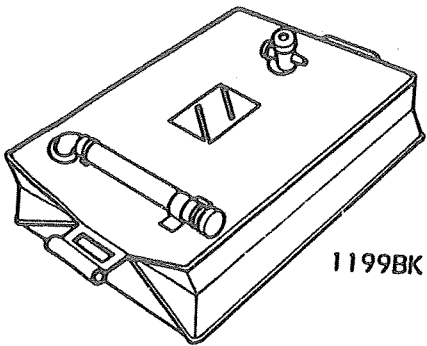
Alu Floorboard Kit
complete = 3883
as seen below



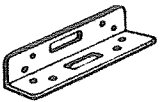
Repair Parts for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)

Part VIII — Optional Accessories Continued

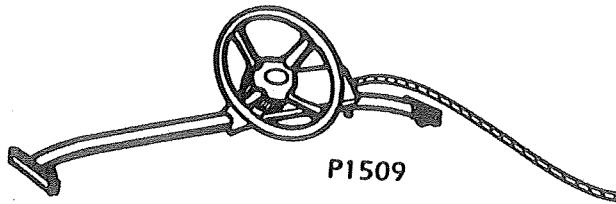
Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
2730	Cap Stringer for Stringer Per 10	Pk	1	0	0
2877	Stop Block for Stringer Per 10	Pk	1	0	0
3032	Stringer, Alum FLBD (2 per boat)	Ea	2	0	0
3033	FLBD, Alum #1 1 per boat	Ea	1	0	0
3034	FLBD, Alum #2 1 per boat	Ea	1	0	0
3035	FLBD, Alum #3 1 per boat	Ea	1	0	0
3037	FLBD, Alum #4 1 per boat	Ea	1	0	0
1050	Cover overall F470	Ea	1	0	0



1199BK



1192



P1509

Repair Parts Kit for Zodiac Marine Commando F470 10 Man (6 Month Supply/2 Boats)
Part VIII — Optional Accessories Continued

Part Number	Item Description	Unit	1ST Echelon	2ND Echelon	3RD Echelon
9605	Fuel Tank, 18 Gal Cap, collapsible Blk, per boat min.	Ea	1	0	0
1192	Throttle box Attachment	Ea	*	0	0
P1509	Steering, remote control, across boat w/10' cable, w/throttle Attch, & steering wheel (per boat)	Ea	1	0	0
11044	This field manual. IPB = Illustrated Parts Breakdown				

Notes

- 7123 Accelerator for NEO glue - 1 litre
 - 7140 Accelerator for PU glue - 1 litre
 - 7074 Latex
 - 7132 Strongan Bk - roll up floor
 - 7046 HY/NEO 940dtx repair fabric F470 1100 gr/m² approx
 - 7028 HY/NEO 1880dtx HD - boat fabric F470 1500 gr/m² approx
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