MFC International
by RESPIREX
ENGINEERED INFLATABLE PRODUCT SOLUTIONS

12 Bar Stak Jak Lifting Mats

Instructions for Use

Contents

1. Identification

1.1. TYPE OF PRODUCT

Stak Jak type -
KSM26, KSM38, KSM74 & KSM90.

Max. lifting capacity

Max. height inflated

Volume

Working pressure 12 bar (174 PSI)

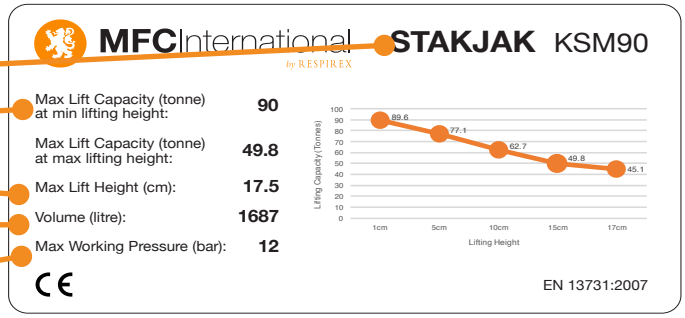

Fig 1.1 Example Stak Jak label

1.2 MANUFACTURER

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This user instruction manual provides guidance on safety, operation, maintenance and parts support for the KSM range of Stak Jak lifting mats.

2. Product Description

2.1. BASIC FUNCTIONS AND APPLICATION AREAS

The Stak Jak is a revolutionary flat-profile lifting cushion developed for vehicle and heavy-duty lifting requirements. Primarily used in emergency rescue situations, they are also suitable for a wide range of industrial, mining and military applications. The flat profile of the Stak Jak has several distinct advantages over traditional ovoid lifting cushions of which the most significant is the ability to safely stack up to three cushions together. This enables a greater lifting height without the risk of sudden ejection or instability that can occur when stacking ovoid mats.

The most convenient source of supply for inflation is from self-contained breathing apparatus cylinders or scuba bottles. Other sources can be compressors, factory air-line supply, vehicle air brake system, foot or hand pump (capable of supplying 12 bar (174 psi) pressure). Filters should be used where there is a possibility of contaminated air supply.

Stak Jaks are slim line for tight space scenarios and compact storage. They are constructed from compression-moulded neoprene that is reinforced with exceptionally tough high tensile Polyaramid cord (DuPont™ Kevlar®) that provides strength and rigidity, yet are light enough to be carried by just one person*. The outer, hot-vulcanised, neoprene cover features a non-slip matrix pattern on both surfaces to increase friction and holding capability.

Stak Jaks can be inflated quickly to provide an instant lift, making them ideal for use in rapid response emergency situations. They also have a controlled deflation facility if required, and can be supplied with an optional bleed valve.

12 bar Stak Jaks are intended for lifting, lowering, positioning, separating and moving of loads weighing up to 89,600 kg (89.6 tonne).

Stak Jak high pressure lifting bags have been independently tested and comply with the requirements of EN 13731:2007 ‘Lifting bag systems for fire and rescue service use - Safety and performance requirements’.

*KSM26 and KSM38 can be carried by one person. KSM74 and KSM90 should be carried by two persons.

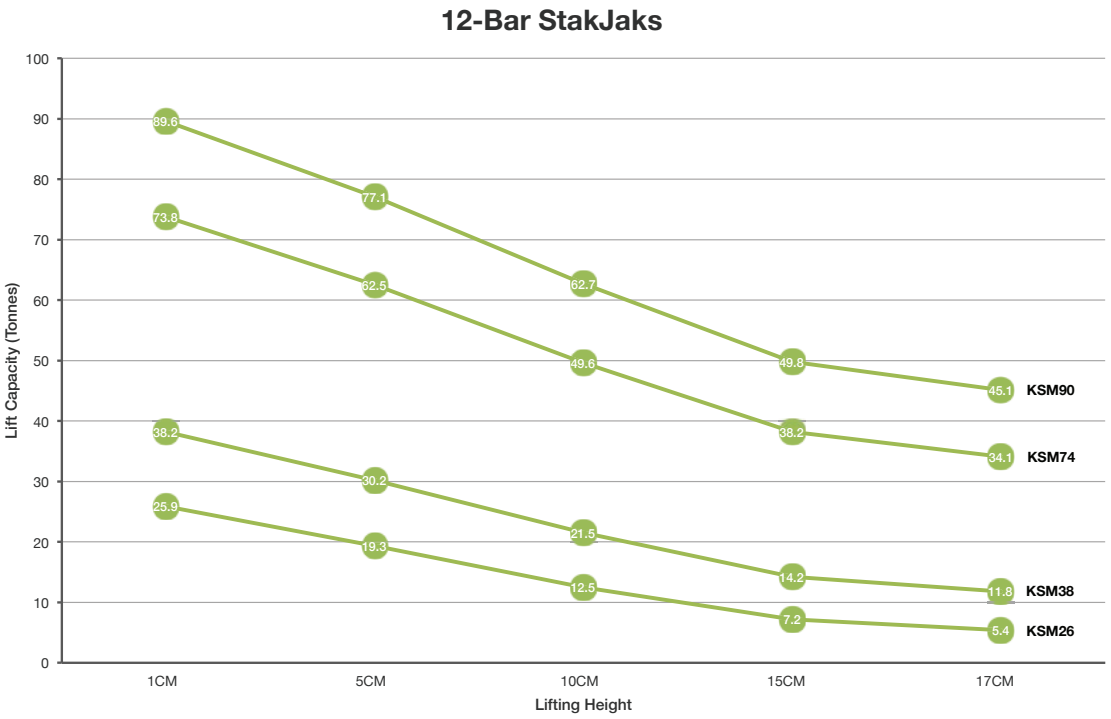


Fig.2.1

2.2. BASIC DATA

Technical Data	KSM26	KSM38	KSM74	KSM90
Product Code	KSM26/12	KSM38/12	KSM74/12	KSM90/12
Length (cm)	52	62	84	92
Width (cm)	52	62	84	92
Inflated Height (cm)	17.5	17.5	17.5	17.5
Deflated Height (cm)	2.5	2.5	2.5	2.5
Packed Size (cm)	55x55x4	65x65x4	88x88x4	95x95x4
Max. Lift Capacity at Min. Lifting Height (tonne)	25.9	38.2	73.8	89.6
Max. Lift Capacity at Max. Lifting Height (tonne)	5.4	11.8	34.1	45.1
Max Flat area (cm)	24x24	34x34	56x56	64x64
Air Requirements (ltr)	479	731	1403	1687
Weight (kg)	8	12	20	23
Max.Pressure (bar)	12	12	12	12

2.3. ENVIRONMENTAL CONDITIONS AND RESTRICTIONS OF USE

Stak Jak IIs are suitable for use within a temperature range of -30°C to +100°C. Between -20°C to -30°C their use is limited to 1 hour, between +90°C to +100°C their use is limited to 30 minutes.

Never use where contact temperatures between the Stak Jak and load to be lifted are in excess of +100°C.

Stak Jaks are **NOT** intended for use in potentially explosive atmospheres. For further information please contact MFC International Ltd.

2.4. SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

Always wear personal protective equipment (PPE) when working with lifting mats. Fire fighters and rescue team members should wear appropriate PPE specified for their work role. Other users should wear a safety helmet, goggles, gloves and protective footwear.

3. Definitions

Stak Jaks lift evenly almost over the entire surface during inflation and thanks to their construction, also maintain the shape and size of the bearing surface

Bearing surface is the surface of the Stak Jak in contact with the load or the object to be lifted

Controller is a device that supplies, empties and monitors the filling procedure with the air.

Working pressure is the pressure in the Stak Jak during operation

Permissible pressure is the maximum inflation pressure in the Stak Jak during operation, specified by the manufacturer.

Inflation connector is the connector on the Stak Jak where outlet hoses are connected

Pressure regulator or pressure reducer reduces the pressure of air supply to the specified pressure value

Safety valve protects the entire system and releases excess pressure to unload the system

Lifting capacity* is the maximum weight that can be lifted by the Stak Jak at a specified pressure

Connection hoses connect the controller and Stak Jaks

Inlet hose is a hose between the air source and controller

Outlet Hose is a hose between the controller and Stak Jak

Contact surface is the surface of the Stak Jak that makes contact with the load at a definite point of time during the inflation procedure

*Max lifting capacity

4. Preparation Of Product For Use

4.1. TRANSPORTATION AND STORAGE

4.1.1 TRANSPORT

During transportation, Stak Jaks should be placed flat (horizontally) or upright (vertically); bending the Stak Jak should be avoided.

Stak Jaks that are stored in a truck compartment that is subjected to constant bumping and vibration will eventually become damaged. It is strongly recommended that Stak Jaks are stored in their own cushioned cartons. It is further recommended that all components are strapped down, braced or secured within the compartment during transport.

4.1.2 STORAGE

Stak Jaks are packed in cardboard boxes; sensitive parts of the mat are additionally protected.

Whether Stak Jaks are stored in a stationary, mobile or movable facility the following conditions apply:

Always store in a clean, dry and dust free environment away from direct sources of light, particularly direct sunlight or intense artificial light with high ultra violet content.

Avoid equipment capable of generating ozone e.g. high voltage electrical equipment.

Stak Jaks should be stored in a temperature range between +5°C to +25°C.

It is recommended that Stak Jaks are stored flat (horizontally). When the Stak Jak is stored horizontally, the inflation connector should be facing forwards in a clearly visible position to prevent damaging occurring when moving.

If the Stak Jak is stored vertically (upright) it is recommended fixing it to a surface (e.g. a wall) to protect against bending. The inflation connector should face upwards and be covered by the protective cap.

It is recommended that Stak Jaks are stored in their original packaging to minimise various environmental influences on the product during storage. Alternatively, optional PVC storage pouches can be used, please contact MFC International Ltd for further information.

4.2. SAFETY PRECAUTIONS BEFORE USE

Always read the instructions carefully and understand safety procedures before use!

Rescue teams should participate in a training course held in conformity with internal training rules. Other users should attend a training course organised by MFC International Ltd or an authorised training service provider.

Never exceed the working pressure of 12 bar.

Under no circumstances should a Stak Jak be inflated to working pressure whilst not under load.

Ensure Stak Jaks are protected from hot vehicle exhausts. Exhausts should be covered with a folded fire and heat resistant blanket.

Keep clear of loads which are unsupported by chocks during lifting operations.

Operators should be positioned away from the direction of anticipated thrust particularly when making space with partially-inserted Stak Jaks.

Never work under a load without safety supports.

Do not use an outlet hose for retrieving or repositioning a Stak Jak.

Ensure all gauges are reading zero before disconnecting hose.

4.3. REMOVAL OF PACKAGING

In order to avoid damaging Stak Jaks do not use sharp objects such as knives, screwdrivers or similar for the removal of packaging.

4.4. DISPOSAL OF PACKAGING

Packaging is made of recyclable cardboard; it should be deposited in waste bins for recycled paper or cardboard packaging.

4.6. INSTRUCTIONS AND PERIODIC TESTS REPORTS

Instructions and periodic test reports are enclosed with every Stak Jak and retained on file at MFC International Ltd for the shelf life of the lifting mat, i.e. 15 years.

Instructions and periodic test reports should be retained throughout the service life of the mat.

5. Instructions for Operations

5.1. RECOMMENDATIONS FOR SAFE AND EFFICIENT WORK

Failure to follow the instructions can put safety of users and third persons at risk and result in significant injury. Carefully read the instructions for operation before using the lifting mat!

WARNING! NEVER REACH UNDER A LOAD WHICH IS NOT PROTECTED BY MECHANICAL SAFETY SUPPORTS

- Never exceed the maximum working pressure (marked on the Stak Jak).
- Never place more than three Stak Jaks on top of each other.
- Never exceed a pressure of 1 bar if no load is placed on the Stak Jak.

- Inflate the Stak Jak until a required or maximum height, or maximum working pressure is reached.
- Improper use of Stak Jaks should be avoided. MFC International Ltd assumes no responsibility for damage resulting from improper use of the product.
- Always use the specified PPE when working with the Stak Jak.

5.1.1. CARRYING THE STAK JAK

Carry the Stak Jak in an upright position and make sure the inflation connector always faces upwards to prevent damage in case of a fall. When carrying several Stak Jaks together they should be placed horizontally and carried by two persons.

Larger and heavier Stak Jaks, i.e. KSM74 and KSM90 should always be carried by two persons.

5.1.2. WORKING ENVIRONMENT

TEMPERATURE OF THE OBJECT TO BE LIFTED:

Protect the Stak Jak with a thermal blanket, fibreboard or rubber-coated steel board if the contact surface temperature of the object to be lifted exceeds 65°C (150°F). Temperatures exceeding the permissible values can damage the Stak Jak. Stak Jaks preserve their lifting capacity and material properties down to the lowest temperature permitted which is -30°C.

LIGHTING OF THE WORKING PLACE:

It is dangerous to work in low light conditions; ensure the work area is not poorly lit or in shadow. MFC International Ltd recommend the use of additional lighting, e.g. floodlights, even during daylight hours when visibility can be poor due to shading or cloud cover. Never use a naked flame for lighting purposes.

PRESENCE OF AUTHORISED PERSONNEL:

Only trained personnel should prepare and lift/lower the load. Other personnel should remain away from the area where Stak Jaks are prepared, lifted or lowered. Appropriate measures aimed at minimizing risks that could endanger the safety of personnel and the environment, such as an outbreak of fire due to fuel leakage, should be put in place prior to carrying out lifting operations.

FIRE AREAS:

Stak Jaks may be used in a fire area only after the contact temperature between the load and the ground drops below 55°C.

5.2. CHOOSING A STAK JAK

The following data is required in order to choose an appropriate Stak Jak:

• Shape of the load

• Weight of the load to be lifted

• Required lifting height

Consider the data about the load weight and required lifting height, see Fig.2.1, in choosing an appropriate Stak Jak.

An example of choosing:

A load of 10 t is to be lifted to the height of 150mm using one Stak Jak.

Considering Fig.2.1, the lifting capacity of KSM38, KSM74 and KSM90 Stak Jaks meet the requirements. The lifting capacity of the KSM26 Stak Jak is not sufficient for reaching a height of 150 mm.

Lifting heights can be increased by stacking up to a maximum of three Stak Jaks on top of each other; see Section 5.4.2.1. For other methods of increasing lifting height see Section 5.4.1. Always use Stak Jaks of the same dimensions when stacking and attach restraining straps to link the mats together.

5.3. SYSTEM FOR STAK JAK INFLATION

- Stak Jaks are to be inflated solely with air, other gases should not be used. Controllers with built-in safety valves should be used for inflation of Stak Jaks.
- Never inflate a Stak Jak without a load to more than 1 bar pressure.
- Inflate the Stak Jak until the required or maximum lifting height or maximum working pressure is reached.

5.3.1. PREPARATION OF STAK JAKS FOR LIFTING PROCEDURE

Prepare the following items for lifting loads using a Stak Jak:

1. Air source
2. Pressure regulator (if the pressure of air source exceeds 12 bar)
3. Controller
4. Outlet hoses
5. Inlet hose
6. Stak Jak

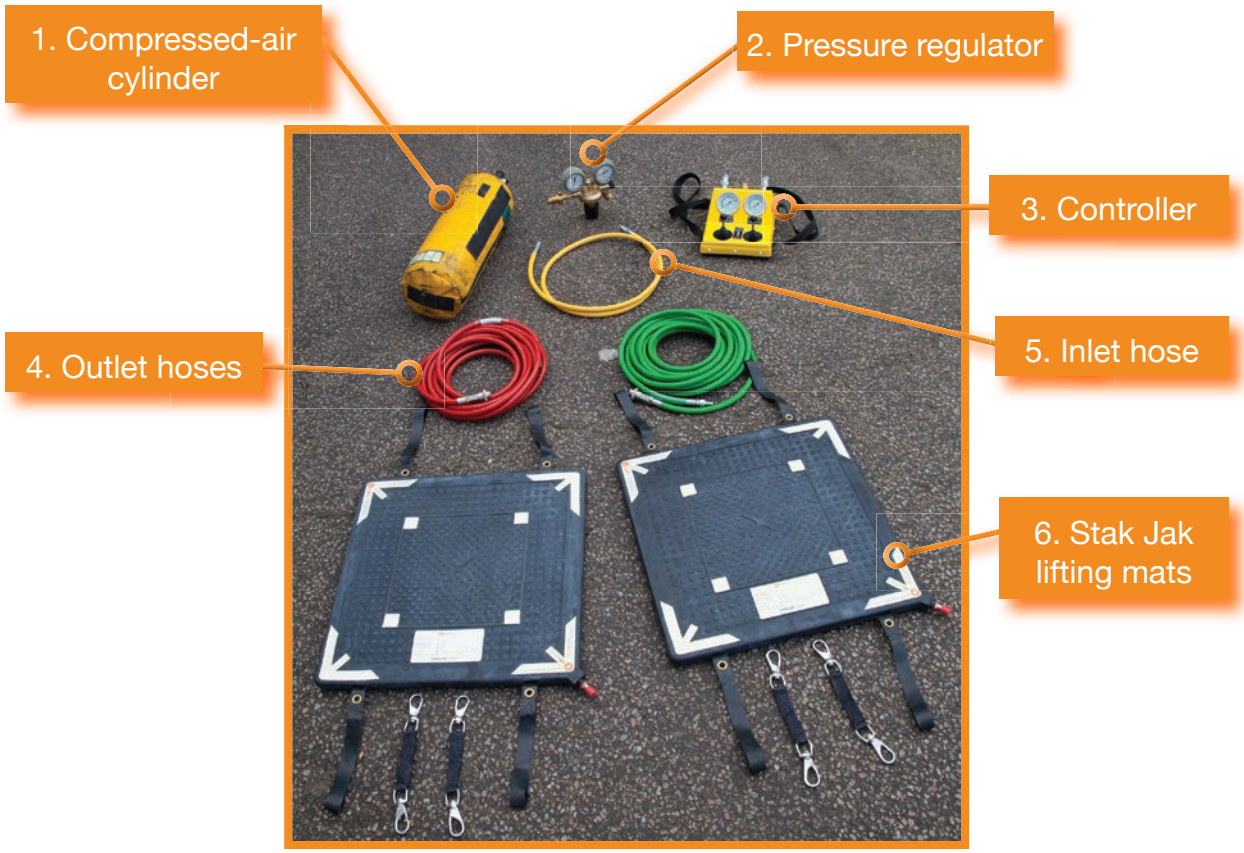


Fig 5.1

Always use the items detailed above when lifting a load using a Stak Jak.

Use only original systems for inflation specified by MFC International Ltd.

If compressed air contains oil, use oil separator.

Step 1: Position the Stak Jaks

Fig 5.2

Position the Stak Jak in a defined and previously prepared location. Follow the rules defined in sections 5.1 and 5.2. Use mechanical supports for load stabilization.

Step 2: Connect outlet hoses to Stak Jak

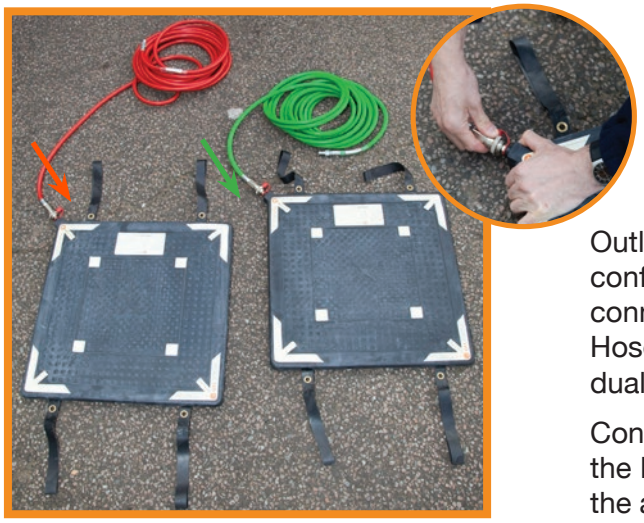


Fig 5.3

Outlet hoses are of different colour to prevent confusion during use. If several Stak Jaks are used, connect each one with a hose of different colour. Hoses are equipped with safety couplings having dual protection.

Connect the safety coupling of the outlet hose to the hose connector on the Stak Jak/s as shown by the arrow, see Fig 5.3, press firmly until it clicks into place.

Step 3: Connect outlet hoses to controller

Fig 5.4

Connect the opposite end of the outlet hose from the Stak Jak to the connection coupling on the controller, see Fig 5.4. If inserted correctly, the connection coupling clicks into place.

The outlet hoses should be entirely unrolled without constrictions or kinks.

Step 4: Prepare the air source

A compressed-air cylinder is the most frequently used air source for Stak Jak inflation.

If a different air source is used make sure that:

- Inlet air pressure supplied to the controller is reduced via the regulator to a maximum of 12 bar.
- The inlet hose connector for connection to the controller should be a type 26 safety coupling.

Step 4.1: Remove the safety plug from the compressed-air cylinder

Fig 5.5

Before removing the safety plug, check if the valve on the cylinder is shut-off; to shut-off the valve turn it clockwise.

Unscrew the safety plug and keep it in a safe place.

Step 4.2: Connect inlet hose to pressure regulator

Fig 5.6

Connect the inlet hose connector to the inlet air supply coupling on the presure regulator; see the arrow in Fig 5.6. If correctly inserted, the coupling on the controller clicks into place.

Step 4.3: Attach the pressure regulator to the cylinder

Fig 5.7

Shut-off the flow valve on the pressure regulator by turning clockwise.

Insert the pressure regulator into the connection on the air cylinder and secure the fixing screw tightly, see Fig 5.7.

If the cylinder is placed on the ground, position the valve so that it is protected from any damage.

Step 4.4: Set the pressure regulator to the required value

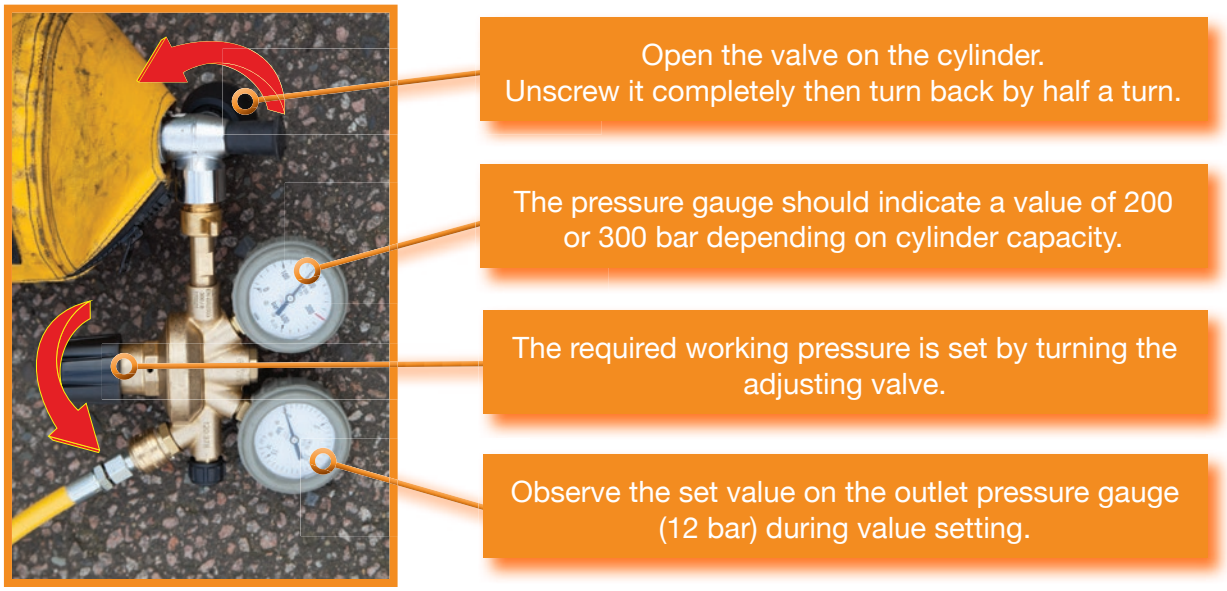


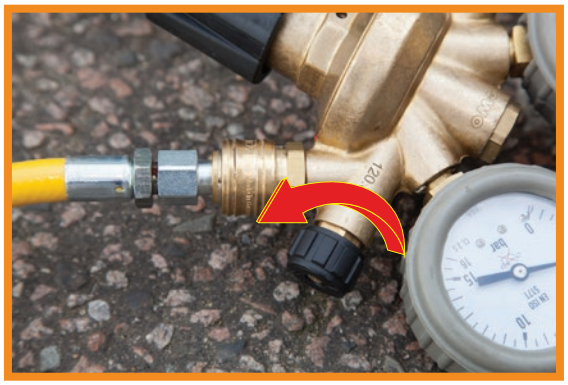
Fig 5.8

Step 5: Connect the inlet hose to the controller

Connect the inlet hose connector to the inlet air supply coupling on the controller; see the arrow in Fig 5.9. If correctly inserted, the coupling on the controller clicks into place. Move the coupling housing by 180° left or right to lock the coupling.

Fig 5.9

Step 6: Relieve the pressure regulator



Release the pressure into the controller by turning the flow valve anti-clockwise.

Fig 5.10

5.3.2. WORKING WITH THE CONTROLLERS

Always monitor the pressure on the respective pressure gauge, the behaviour of the Stak Jaks and the load during inflation.

If the maximum pressure is exceeded the safety valve on the controller activates and relieves the pressure from the Stak Jak.

5.3.2.1. DUAL CONTROLLER AND SINGLE CONTROLLER WITH CONTROL LEVERS

Fig 5.11

By using a dual controller, one, two or three Stak Jaks can be operated simultaneously. The Stak Jaks are handled by means of a control lever under the respective pressure gauge. When the control lever is pushed forwards, the pressure in the connected Stak Jak builds up. When the control lever is pulled backwards, the pressure in the Stak Jak reduces. When the control lever is released, it automatically returns to its neutral position. The filling and discharge valve is shut-off.

5.3.3. DISCONNECTING STAK JAKS

Stak Jaks and other required components are under high-pressure, extreme caution is required when disconnecting. Disconnect the Stak Jaks as follows:

Step 1: Shut-off the valve on the compressed-air cylinder; see Fig 5.5.

Step 2: Shut-off the flow valve on the pressure regulator by turning clockwise; Fig 5.10.

Step 3: Completely release the pressure from the connected Stak Jaks by means of the controller, see Fig 5.11.

Step 4: Completely release the air from the outlet hose and valves that are connected to the Stak Jaks by means of the controller, then immediately empty the Stak Jaks once again.

Fig 5.12

Step 5: Disconnect the inlet hose from the controller by rotating the coupling housing until the groove on the housing clicks in, see Fig 5.12. Slide the coupling housing towards the controller and disconnect the inlet hose from the controller.

Step 6: Dismount the pressure regulator

Unscrew the locking nut on the pressure regulator and detach the regulator from the compressed-air cylinder, see Fig 5.7.

Step 7: Attach the safety plug on the compressed-air cylinder, see Fig 5.5.

Fig 5.13

Step 8: Disconnect the outlet hoses from the controller by pushing the hose connector towards the controller. Slide the coupling housing backwards towards the controller. Release the hose from the coupling.

When outlet hoses are disconnected, the pressure automatically releases from the hoses.

Step 9: Remove the Stak Jaks from the work area and keep them in an easy accessible place.

WARNING! Never remove Stak Jaks by pulling on the outlet hoses.

Fig 5.14

Step 10: Disconnect outlet hoses from the lifting bag by pushing the hose coupling towards the Stak Jak. Slide the hose coupling sleeve collar backwards away from the Stak Jak and release the hose; the plug of the Stak Jak automatically jumps out of the coupling.

5.4. LIFTING PROCEDURE

Before starting work, check the location where the Stak Jak is to be positioned.

Remove any sharp objects such as glass fragments or other foreign particles to avoid damaging the Stak Jak. Never lift with a Stak Jak that is in contact with any sharp metal edges, nails, screws or similar that may puncture, abrade or otherwise damage the Stak Jak.

If a Stak Jak is to be used where a danger of slippage exists due to:

- oil spillages
- chemicals that could affect the properties of rubber
- ice or snow

spread some sand or other granulated material between the Stak Jak and the surface to increase friction or use a fibreboard as protection.

If the Stak Jak is used on non-consolidated or soft terrain place a firm support, e.g. a fibreboard, under the Stak Jak to assure stability during lifting and prevent possible slippage of the load or the Stak Jak itself.

WARNING! A mechanical safety support MUST be used in all lifting operations. Never work under a load that is only supported by means of an inflated Stak Jak.

Position the bag in a prepared location or on a built support, see Fig 5.15.

WARNING! Certain parts of the load may not be fixed to the main load to be lifted. Any loose parts should be secured or removed. Under no circumstances should loose parts be supported by an inflated Stak Jak in order to lift the main load.

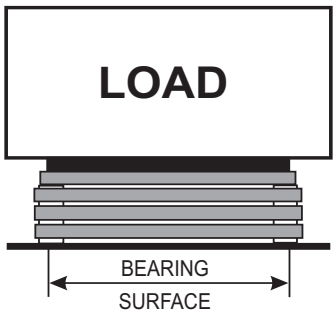


Fig 5.15

Fig 5.15: Mechanical safety support and bearing surface

A mechanical safety support should be firm enough to withstand the load. It should be placed on a solid surface to minimise the possibility of slipping.

Lifting capacity (tonne) is highest at the beginning of the lifting procedure when the lifting height is at its lowest (Fig 5.15). For the lifting capacity depending on the lifting height see Fig.2.1.

5.4.1. LIFTING WITH A SINGLE STAK JAK

If only one Stak Jak is available and the gap between the ground and the object to be lifted exceeds 70mm, build a firm and sufficiently high support to a point that just allows enough space to insert an uninflated Stak Jak.

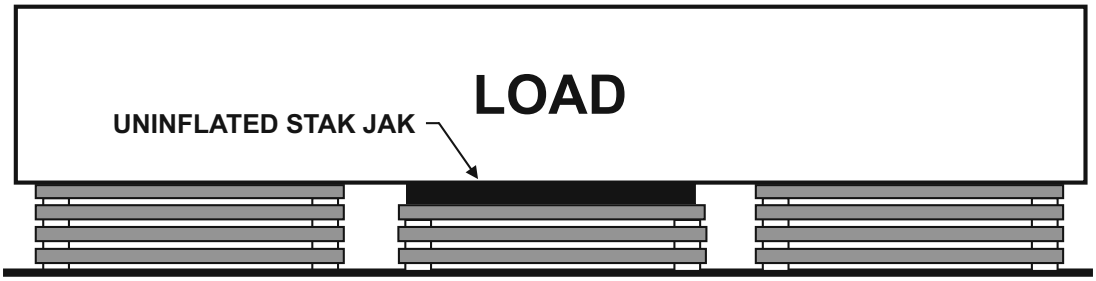


Fig 5.16

Build a safety support on each side of the load to a point where it is impossible to insert another level (Fig 5.16). Follow this process to minimize the height from which the load may drop in the event of an abrupt air loss from the Stak Jak.

Position the Stak Jak on the middle of the support so that its inflation connector is facing forwards. Make sure that the area of Stak Jak's upper surface within the four white squares (the bearing surface) makes contact with the underside of the load. If the Stak Jak is not positioned centrally beneath the load the bearing surface may be reduced, this can cause the load to slip away during inflation and may lead to a sudden and uncontrolled ejection of the Stak Jak.

Slowly inflate the Stak Jak to reach the required height and simultaneously add lateral safety supports, see Fig 5.17.

The uppermost support must be sufficiently solid to prevent shifting or collapse during inflation when the Stak Jak takes up its shape.

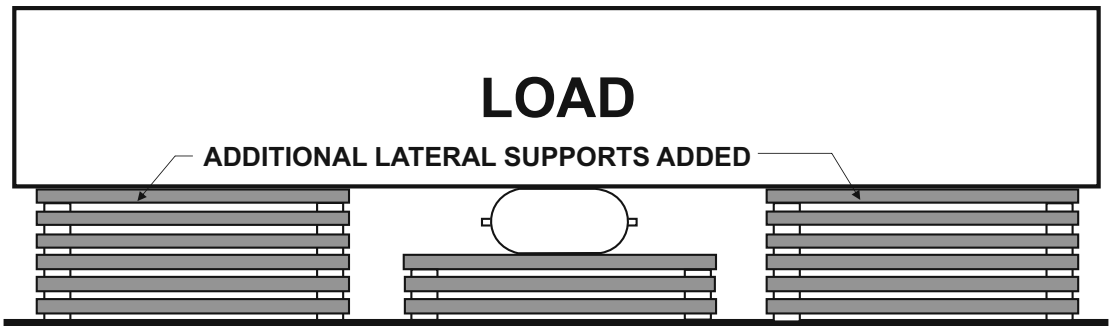


Fig 5.17

Do not inflate the Stak Jak whilst adding lateral safety supports.

Once the final lift height has been reached, carefully deflate the Stak Jak to allow the load to rest fully on the lateral safety supports. If a working space is required under the point of lifting, remove the Stak Jak and the support(s) beneath it.

When working under a load, the load should be stabilised and the Stak Jak completely deflated.

5.4.2. LIFTING WITH SEVERAL STAK JAKS, INCREASING THE LIFTING CAPACITY

Lifting capacity can be increased by positioning two Stak Jaks side by side and simultaneously inflating, see Fig 5.18. The new capacity is double that of a single Stak Jak.

Example:

The capacity of combined Stak Jaks KSM26 and KSM26 side by side and simultaneously inflated amounts to 52 t, i.e. capable of lifting a load of 52 t.

Fig 5.18: Two Stak Jaks placed side by side to increase the lifting capacity

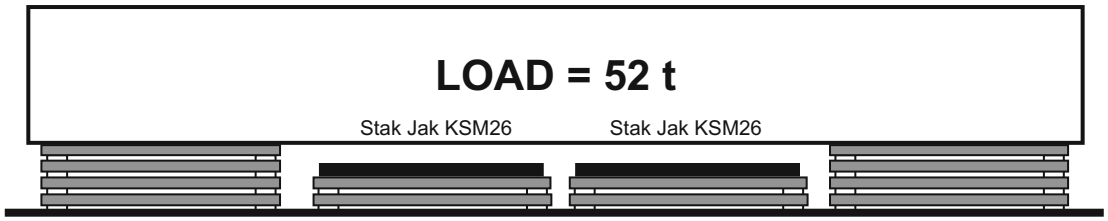


Fig 5.18

Lifting height can be increased by stacking one Stak Jak on top of the other, see Fig 5.19 and sections 5.4.2.1 and 5.4.2.2. The total lifting height of such a combination equals the sum of lifting heights.

Lifting capacity does not increase by stacking 2 or 3 Stak Jaks one on top of the other; only lifting height increases. The load capacity of the combination equals the capacity of a single Stak Jak.

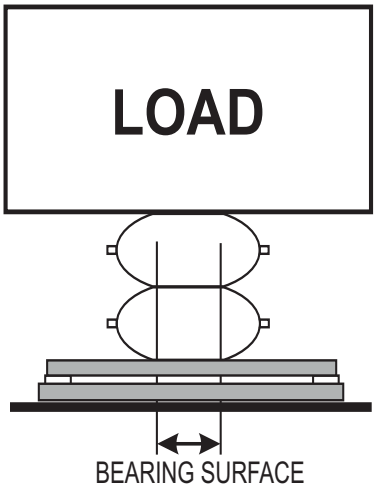


Fig 5.19

Fig 5.19: Combined Stak Jaks to increase lifting height

WARNING: If the required lifting height cannot be determined, choose the biggest Stak Jak available that can be placed under the load.

Example:

A combination of Stak Jaks KSM26 (17.5 cm) and KSM26 (17.5 cm) stacked one upon the other enables a total lift height of 35 cm.

5.4.2.1 LIFTING USING TWO OR THREE STAK JAKS

A MAXIMUM of THREE Stak Jaks may be combined to increase lifting height. If lifting with two or three Stak Jaks to achieve a higher lift, only use Stak Jaks of the same dimensions.

When combining Stak Jaks to increase lifting height, place the Stak Jaks on top of each other and make sure that all connectors are facing forwards, see Fig 5.20. Attach the restraining straps and connect the Stak Jaks together using the karabiner clips to prevent slipping.

Set up the safety support and base for the Stak Jak, follow the procedure for working with a Stak Jak, see section 5.4.1.

Fig 5.20: Combining Stak Jaks to increase lifting height

Fig 5.21

When using a combination of 2 or 3 Stak Jaks on top of each other, the order of inflation is always 1, 2 and 3 (lower bag first) see Fig 5.21, to ensure maximum stability during the lift of the load.

5.4.3. LIFTING LOADS OF UNUSUAL SHAPE

5.4.3.1. LIFTING OF PIPES AND PROFILES

A problem arises when the load does not rest over the entire lifting surface of the Stak Jak. Moreover, the Stak Jak may become damaged if it bends or is overloaded with angular, jagged or sharp-edged loads.

Insert a fibreboard or similar between the Stak Jak and the load to allow the lifting force to evenly distribute over the entire lifting surface, see Fig 5.22.

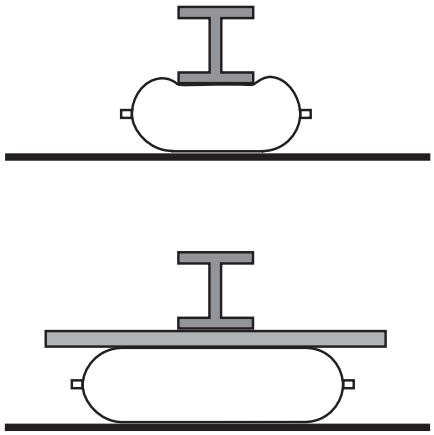


Fig 5.22: Supporting the Stak Jak with a fibreboard when lifting profiles or pipes

Fig 5.22

5.4.3.2. LIFTING OF CYLINDRICAL OBJECTS

Larger cylindrical objects such as tanks cannot be lifted using a single Stak Jak. If the load is not firmly fastened it will roll away as soon as the Stak Jak begins to inflate.

For this reason, two Stak Jaks are used for lifting of cylindrical objects, placed one at each side of the object, see Fig 5.23. Make sure that Stak Jaks are inflated evenly and simultaneously.

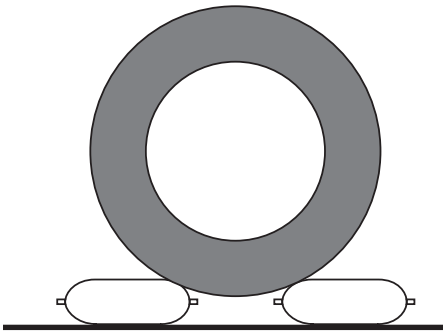


Fig 5.23: Lifting large cylindrical loads

Fig 5.23

5.4.3.3. USING A STAK JAK TO SEPARATE OR MOVE AN OBJECT

Stak Jaks can be used for separating and moving objects horizontally. Position one face of the Stak Jak against a bar, a pillar or another firm and rigid object; position the opposite face against the object to be moved.

Thin-walled objects, e.g. sheet metal panelling, may bend or rupture due to the Stak Jak's pressure. To prevent damage occurring, insert a thick fibreboard or similar between the Stak Jak and the object to be moved, this will distribute the moving force over a greater surface area, see Fig 5.24.

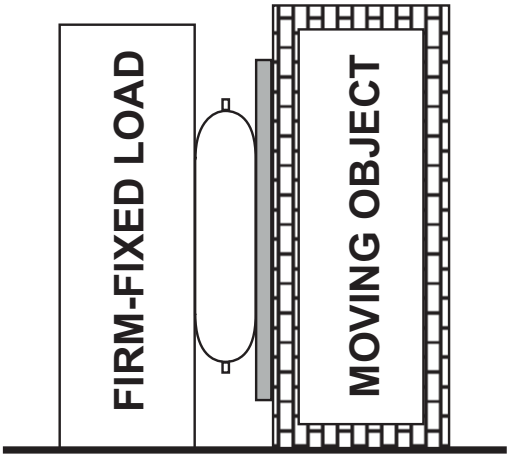


Fig 5.24

Fig 5.24: Moving or separating objects

5.4.3.4. FURTHER EXAMPLE APPLICATIONS FOR STAK JAKS

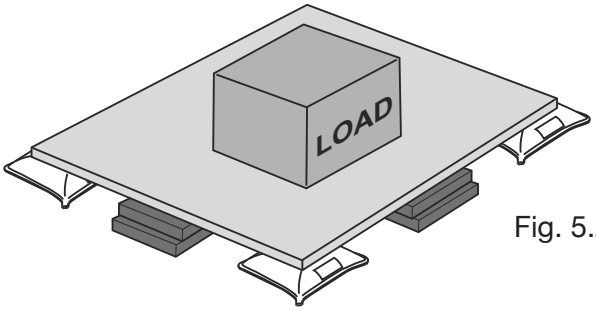


Fig. 5.25: Increasing lifting area using multiple Stak Jaks

Fig. 5.25

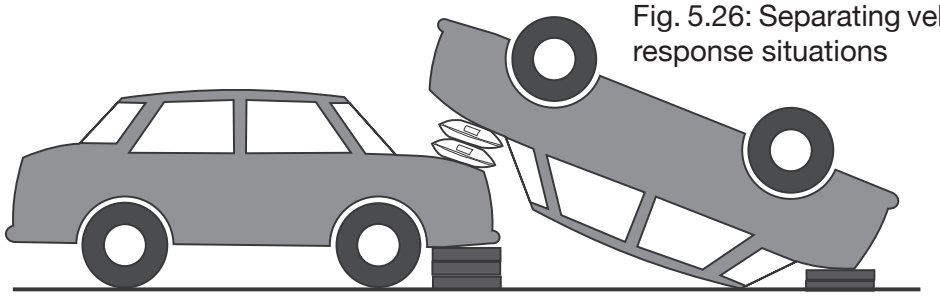


Fig. 5.26: Separating vehicles during emergency response situations

Fig. 5.26

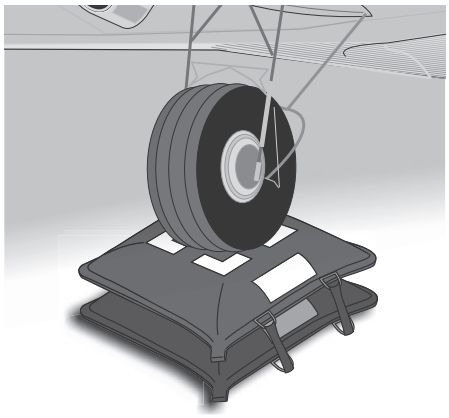


Fig. 5.27: Aircraft support and repair

Fig. 5.27

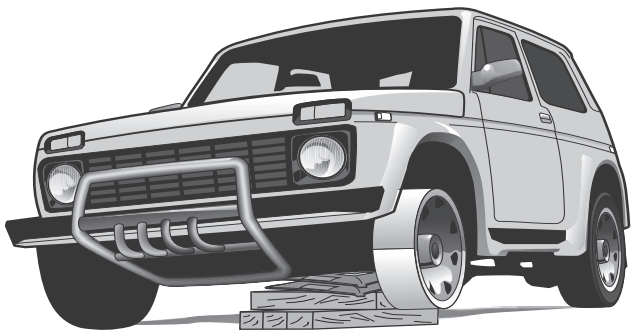


Fig. 5.28 Vehicle wheel or tyre replacement

5.5. UNEXPECTED SITUATIONS

If the Stak Jak, hoses or any other components of the lifting system suffer damage which may compromise safety at work, immediately interrupt work and replace the damaged component. Never use Stak Jaks and hoses that exhibit cracks, bulges, unusual deformations or similar.

If the lifting of a load using a Stak Jak is considered to be a hazard, either to the persons to be rescued or the rescue team, immediately stop the lifting process. Consult rescue operations professionals on the use of an alternative lifting method (crane, towing, etc.).

A very loud bang is heard if the Stak Jak bursts.

Unexpected Situation	Consequence	Procedure
Abrupt pressure drop in the Stak Jak. The Stak Jak and the load sink in an uncontrolled manner.	The load sinks down to the support. A very loud bang is heard when the Stak Jak bursts.	If a failure is identified on one or more of the components, replace those components; otherwise replace all components.
The pressure gauge indicates the working pressure is reached but the Stak Jak fails to lift.	The load cannot be lifted.	Double check whether a suitable Stak Jak was chosen.
In spite of the activated valve for bag inflation, the working pressure on the pressure gauge is not reached.	The load cannot be lifted.	Check the Stak Jak inflation system. Examine individual components and if a failure is identified on one or more of the components, replace the component; otherwise replace all system components.
Uncontrolled slipping of the load or Stak Jak.	The load is unbalanced.	Very carefully lower the load to ground level or to the support by deflating the Stak Jak. Check and, if necessary, re-arrange the basic positioning of the Stak Jak and/or support.
Exceeding the working pressure in an uncontrolled manner.	Stak Jak bursts accompanied by a loud bang.	The Stak Jak's system is secured by means of safety valves. If working pressure is exceeded, immediately interrupt the lifting procedure and carefully lower the load to the prepared supports. Check the Stak Jak's inflation system. Examine individual components and if a failure is identified on one or more of the components, replace the respective component, or replace all system components.

5.6 OPTIONAL ACCESSORIES

Please see below for a list of optional accessories suitable for use with Stak Jak lifting mats. Further information is available from MFC International Ltd.

Controllers & Regulators

12 Bar Steel Controller

12 Bar Plastic Controller

12 Bar Hand Held Controller

12 Bar Aluminium Single Control Unit

12 Bar Aluminium Double Control Unit

12 Bar Aluminium Triple Control Unit

12 Bar Regulator

Scuba 300 Bar Regulator

Hoses

Blue Outlet Hose (5m / 10m)

Red Outlet Hose (5m / 10m)

Green Outlet Hose (5m / 10m)

Yellow Inlet Hose (2m / 5m / 10m)

Yellow Outlet Hose (5m / 10m)

Couplings

Series 25
Female Coupling
1/4” BSP Female Thread

Series 25
Male Coupling
1/4” BSP Female Thread

Series 25
Male Coupling
1/4” BSP Male Thread

Series 26
Female Coupling
1/4” BSP Male Thread

Other Accessories

Safety Chocks

Part numbers dependant on hose length and couplings selected. Contact MFC International for more information.

5.7. DISPOSAL OF WASTE MATERIAL

A damaged or unserviceable product or a product whose service life has expired should be withdrawn from the use.

As Stak Jaks are designated as recyclable, waste classification according to valid local regulations applies.

6. Maintenance and Cleaning

6.1. SAFETY PRECAUTIONS

Use protective goggles, gloves and footwear when cleaning Stak Jaks.

6.2. MAINTENANCE AND CLEANING AFTER USE

6.2.1. MAINTENANCE OF STAK JAKS AFTER USE

Stak Jaks are predominantly used in environments where contaminants are present (accident sites, manufacturing and construction sites etc.); it is therefore vitally important that thorough cleaning and inspection takes place after every use before Stak Jaks are placed into storage.

Accumulations of dirt, oil and grease on the surface can cause Stak Jaks to slip during use. Clean by scrubbing thoroughly with a solution of warm soapy water using a stiff bristled brush or broom and then rinse by spraying with cold water. Never use sharp objects to remove dirt from the surface. If any cleaning solution or water enters a Stak Jak during cleaning, allow it to dry thoroughly before reusing.

Never use any petroleum based products, thinning agent, alcohol or aggressive cleaning agents for cleaning Stak Jaks as these can adversely affect the product and lead to unexpected component failure.

Never use high-pressure jet washers on Stak Jaks.

Dirt in the inflation connector can cause blockages and obstruct airflow through the outlet hoses. Check the opening in the connector; if any dirt is present it can be removed using a thin wire. Be careful to draw the dirt out of the connector rather than pushing it into the Stak Jak.

Do not drag or drop the Stak Jak on the inflation connector; this can lead to breakage of the connector and render the Stak Jak unserviceable. Breakage of the brass inflation connector is not covered under the warranty.

After cleaning, place the Stak Jak upright and wipe the connector with a clean cloth. Allow Stak Jaks to dry naturally in the air, never dry by means of a heating device or by placing in a drier.

After cleaning and drying, examine the Stak Jak as follows:

- Examine all surfaces for air blisters, cuts, abrasions or bulges (ply separation) that might be hidden under debris. Pay particular attention for any evidence that fibres of the inner Polyaramid core are protruding through the surface of the Stak Jak. The strength of the Stak Jak is essentially the Polyaramid core and if this is found to be exposed the Stak Jak should be withdrawn from use immediately. Shallow surface cuts or abrasions will not affect the efficiency of the Stak Jak. If a Stak Jak leaks, it is NOT repairable.
- Mark any damage or defects using chalk. If there is uncertainty about the condition of a damaged Stak Jak, consult MFC International Ltd or an authorised service representative regarding further use of the bag.
- Examine the Stak Jak inflation connector for any damage that may prevent connection to outlet hoses. Damaged inflation connectors should be replaced.

6.2.1.1 REPLACING THE STAK JAK INFLATION CONNECTOR

The following items are required when replacing a Stak Jak inflation connector:

- Spare Type 25 male connector (male thread)
- 2 x 17mm spanner
- Liquid thread sealant

Using two 17mm spanners, unscrew the damaged inflation connector from the Stak Jak as shown in Fig 6.1. Apply a small amount of liquid thread sealant, e.g. Bondloc B542 or equivalent, to the thread of a new series 25 male connector (follow guidance from thread sealant manufacturer for precise details) and screw into Stak Jak. Tighten using 17mm spanners.

Fig 6.1

Fig. 6.1: Removing damaged inflation connector from Stak Jak

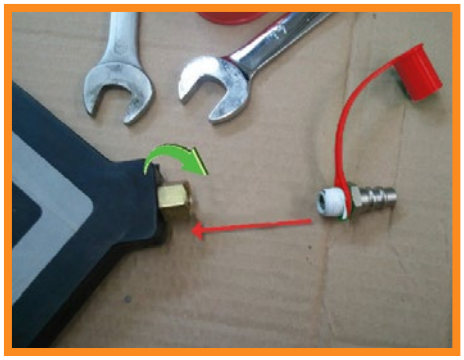


Fig 6.2

Fig 6.2: Attaching a new connector

6.2.2. MAINTENANCE OF HOSES AFTER USE

After each use, hoses should be cleaned using a mild solution of washing-up liquid and warm water; then rinsed with clean cold water.

Do not use high-pressure jet washers on hoses.

Check the opening in the connector and coupling. If the connector and coupling are filled with dirt, remove using a thin wire. Always pull dirt out of the connector or coupling; avoid pushing dirt into the hose.

Wipe hoses with a dry cloth.

Do not dry hoses in a drier or by means of heating devices; allow to dry naturally.

Carefully examine the cleaned and dried hoses, as follows:

- Check for any cuts or abrasions. Mark any damage or defects using chalk and consult MFC International Ltd or an authorised service regarding further use of the hose.
- Check hose series 25 male connector. If damage prevents connection to the coupling on the controller, the outlet hose should be replaced.
- Check hose series 25 female coupling; if damage prevents connection to the connector on the Stak Jak, the outlet hose should be replaced.

6.2.3. MAINTENANCE OF THE CONTROLLER AFTER USE

Controllers should be cleaned and maintained in compliance with the relevant instructions supplied.

6.3. PREVENTIVE MAINTENANCE

Preventive maintenance includes routine inspection of Stak Jaks and associated equipment for lifting, performance of tests and replacement of damaged parts.

The enclosed check-up lists can offer assistance when carrying out preventive maintenance.

Always comply with the valid local regulations when carrying out preventive maintenance.

Always wear personal protective equipment (PPE) during check-ups and testing. Fire fighters and rescue team members should wear appropriate PPE specified for their work role. Other users should wear a safety helmet, goggles, gloves and protective footwear.

For further information regarding how to carry out preventative maintenance please contact MFC International Ltd.

If you are unsure as to the safe performance of a test consult MFC International Ltd or an authorised representative.

Function tests or pressure tests should only be carried out after a visual check has verified that the bag is defect free.

Never use a Stak Jak if a visual or function test has identified damage, leakages or irregularities in operation of the equipment.

6.3.1. CHECK-UP INTERVAL

Stak Jak lifting mat

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.1.
Function test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.2.
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

Pressure Regulator

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.3.
Function test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.4.
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

Hoses (Outlet and Supply)

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.5.
Function test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.6.
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

Controller

Test	Check-up interval	Performed by	Procedure
Visual test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.7.
Function test	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.8.
Function test of pressure gauges	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.9.
Function test of safety valve	After every use Annually	Personnel qualified for operating Stak Jaks	Section 6.3.1.10.
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

6.3.1.1. VISUAL TEST OF THE STAK JAK

The following test should be performed outdoors only. Observe a safe distance between all personnel present, neighbouring buildings and the Stak Jak under test.

Connect an unloaded Stak Jak as specified in section 5.3. Inflate the Stak Jak to 0.2 x working pressure (2.4 Bar, 35 psi). Visually check for any unusual bulges, punctures, cuts, abrasions or other mechanical damage. Using a brush, apply some soapy water over the entire surface of the Stak Jak, including around the inflation connector. Visually check the surface of the Stak Jak for any air bubbles denoting a leak(s).If air leakage is detected the Stak Jak is not repairable and should be withdrawn from service.

6.3.1.2. FUNCTION TEST OF THE STAK JAK

The following test should be performed outdoors only. Observe a safe distance between all personnel present, neighbouring buildings and the Stak Jak under test.

Locate the Stak Jak in a testing jig which restricts the inflated height of the lifting bag to a maximum of 17.5cm and connect as specified in section 5.3. Inflate the Stak Jak to 0.5 x working pressure (6 Bar, 87 psi). The Stak Jak is functional if the pressure does not drop by more than 10% within an hour.

Never test the Stak Jak unrestricted.

6.3.1.3. VISUAL TEST OF PRESSURE REGULATOR & HOSES

Visually check for any signs of obvious damage on:

- Threads of cylinder connection locking nut, see Fig 5.7 on page 8.
- Pressure gauges and the maximum working pressure marking
- Protective caps on pressure gauges
- Flow valve
- Hoses for splits, abrasions or other damage, e.g. damage as a consequence of contact with acids

6.3.1.4. FUNCTION TEST OF PRESSURE REGULATOR

Connect the pressure regulator to a standard compressed-air cylinder. Shut off the flow valve.

Open the valve on the cylinder. The left pressure gauge on the regulator should display the cylinder contents.

Using a brush, apply some soapy water around the connection between the regulator and the cylinder and check for air bubbles denoting a leak(s).

Rotate the adjusting valve and reduce the outlet pressure until 0 bar is displayed on the right hand gauge. Rotate the adjusting valve in the opposite direction until the maximum value marked on the right hand gauge is reached (12 bar). The adjusting valve should permit setting and operate smoothly throughout the working range.

Using a brush, apply some soapy water around the connector and check sealing of the flow valve.

Connect an inlet hose between the pressure regulator and controller. Slowly open the flow valve until it is fully open. The flow valve should operate smoothly at all times. The pressure gauge on the controller should display the same value as displayed on the right hand pressure gauge of the pressure regulator. Using a brush, apply soapy water to the inlet hose between the pressure regulator and controller and check all connections for leaks.

6.3.1.5. VISUAL TEST OF THE OUTLET HOSE

Visually check for damage on:

- Connection couplings (series 25)
- Hoses for splits, abrasions or other damage, e.g. damage as a consequence of contact with acids

6.3.1.6. FUNCTION TEST OF THE OUTLET HOSE

Connect the controller and Stak Jak with an outlet hose, see section 5.3.1. Inflate the Stak Jak to 0.2 x working pressure (2.4 Bar, 35 psi). Using a brush, apply soapy water to all connections and the outlet hose itself, then check for air bubbles denoting a leak(s).

6.3.1.7. VISUAL TEST OF THE CONTROLLER

Visually check for any signs of obvious damage on:

- Inlet connecting couplings (series 26)
- Outlet connecting couplings (series 25)
- Pressure gauges and the maximum working pressure marking
- Body of controller

6.3.1.8. FUNCTION TEST OF THE CONTROLLER

Connect the inlet hose from the pressure regulator; see section 5.3.1, to check the function of the inlet coupling. Connect the controller and Stak Jak with an outlet hose, see section 5.3.1, then check the function of the outlet couplings. Firstly move the control levers into the lifting position and then into the lowering position. Control levers should operate smoothly. When the control lever is in the lifting position, the connected Stak Jak should lift.

WARNING: Do not exceed 0.2 x working pressure in the Stak Jak.

6.3.1.9. FUNCTION TEST OF PRESSURE GAUGES ON THE CONTROLLER

Functionality of pressure gauges fitted to the controller is tested by means of reference pressure gauges. **This testing can only be undertaken by MFC International or an authorised representative.**

6.3.1.10. FUNCTION TEST OF THE SAFETY VALVE

With an inlet hose still connected to the controller, connect the pressure regulator. See section 5.3.1.

Move the control lever into the lifting position and gradually build up pressure in the controller until the safety valve opens and the working pressure is exceeded (12 bar). The safety valve is functioning correctly if it activates within the range of 0+10% working pressure of the controller. When activated the safety valve emits a characteristic sound. Reduce the pressure in the controller and check that the safety valve re-seats before 10.8 bar, the valve should cease to emit the characteristic sound.

6.3.1.11. HYDRAULIC PRESSURE TEST

Prior to delivery Stak Jaks undergo a ten minute hydraulic pressure test at 1.5 x working pressure, i.e.18 bar. **This testing can only be undertaken by MFC International or an authorised representative.**

6.4 SERVICE LIFE

A serial number is displayed next to the connector on the Stak Jak. The first two digits indicate the month of manufacture and the second two digits the year of manufacture.

Stak Jaks are manufactured from neoprene and are therefore subject to a natural ageing process. Although regular visual inspections can help assure good operational condition, Stak Jaks should always be removed from service after 15 years as the material construction can mask signs of ageing.

6.5 TROUBLESHOOTING

Fault	Reason	Remedy
Inlet pressure gauge of pressure regulator does not display sufficient pressure	Empty compressed air cylinder	Replace the cylinder
	Shut-off valve on the cylinder	Open the valve on the cylinder
Required pressure cannot be set on the outlet pressure gauge of pressure regulator	Adjusting valve blocked pressure in the cylinder	Briefly (1s) open the flow valve. Try to set the pressure repeatedly
	Adjusting valve failure	Replace the pressure regulator
	Outlet pressure gauge failure	Replace the pressure regulator
The pressure regulator hose cannot be correctly inserted into the controller's connecting coupling	Dirt on the connector or coupling	Clean the plug and coupling
	Connector or coupling are damaged	Replace the pressure regulator and/ or controller
Inlet hose cannot be correctly inserted in controller's connecting coupling	Dirt on connectors or couplings	Clean the connector and coupling
	Connectors or couplings are damaged	Replace hose and/or controller
Despite activating the control lever for inflating the Stak Jak, the Stak Jak does not inflate	Safety valve failure	Replace the controller
	Connector or coupling blocked	Tighten the protective screw on safety valve
	The pressure regulator hose and/or inlet hose are incorrectly connected	Clean the connector or coupling
	The pressure regulator hose and/or inlet hose are damaged and do not seal correctly	Check and re-connect the pressure regulator hose and/or inlet hose
		Replace the pressure regulator hose and/or inlet hose
Despite activating the control lever for lowering the Stak Jak, the Stak Jak fails to deflate	Connectors or couplings are blocked	**Warning!** **Exercise the utmost caution when carrying out the following procedure** 1. Double-check whether the load is correctly supported to assure stability when deflating Stak Jaks 2. Shut-off the valve on the cylinder 3. Disconnect the outlet hose from the controller to deflate Stak Jak 4. Exercising the utmost caution, disconnect the hose from the Stak Jak which has failed to deflate 5. If the Stak Jak still fails to deflate, clean the inflation connector with a small screwdriver; keep a safety distance
Foreign bodies embedded into surfaces of the Stak Jak	Stak Jak used on rough terrain, e.g. gravel etc.	Smaller foreign bodies may only be removed from the surface if they do not damage an area by more than 25mm^2 (1inch^2), and are not too deeply embedded. Only small fibres are permitted on the surface, larger items, e.g. stones etc. can change or affect the Stak Jak's contact surface. Stak Jaks with larger items embedded should be withdrawn from service immediately.

Fault	Reason	Remedy
Bulges on Stak Jak lifting surfaces	Damage to internal structure of Stak Jak leading to voids, e.g. ply separation	Bulges on the lifting surfaces of Stak Jaks can effect efficiency and safe operation. Internal damage is irreparable and Stak Jaks exhibiting bulges must be withdrawn from use immediately.
Screw thread damaged on inflation inlet	Inflation connector overtightened	Stak Jaks that have damaged screw threads on the inflation inlet must be withdrawn from use. Always follow the procedure detailed in 6.2.1.1 when changing an inflation connector.
Surface cracks/splits	Stak Jak accidentally cut whilst being removed from packaging or due to use on sharp objects, e.g. broken glass	Cracks/splits of no more than 0.8mm (1/32”) in width and 0.8mm (1/32”) in depth, and no more than102mm (4”) in length are acceptable. Stak Jaks with cracks/ splits of greater size should be withdrawn from use immediately.
Torn/Ripped Handles	Handles accidentally cut, e.g. during removal from packaging	The Stak Jak remains usable but should be re-tested. Contact MFC International or an authorised service representative.
Illegible labelling	Dirt, Oil etc. on labels	Stak Jak should be cleaned so that labelling remains visible for operators to read.
Illegible serial number	Damage caused by general wear and tear	Contact MFC International or an authorised service representative to have serial number reapplied to Stak Jak.
Damage to edges of Stak Jak	Incorrect storage	The Stak Jak remains usable but avoid storing vertically on sharp or rough surfaces that may cause cuts or deformities to edges.

7. Warranty Conditions

7.1. GENERAL CONDITIONS

7.1.1. These warranty conditions apply as of dd/mm/yyyy for products manufactured by MFC International Ltd. If any provision of these warranty conditions are contrary to any mandatory legal provisions in any particular jurisdiction, such provision shall apply to a maximum extent as provided for by such mandatory legal provisions.

7.1.2. Products which may be sold by MFC International Ltd but not manufactured by it are not covered by this warranty and are sold exclusively with warranties, if any, by their original manufacturer.

7.2 MANAGEMENT OF PRODUCTS

7.2.1 In order to claim a remedy pursuant to this warranty, the purchaser must conform to the Stak Jak instructions for use.

7.3. WARRANTY

7.3.1. MFC International Ltd warrants to the purchaser that for the period of twelve (12) months as of delivery of the products, such products shall be free from defects in material and workmanship, subject to proper usage in accordance with manufacturer's instructions. For Stak Jaks the warranty period amounts to sixty (60) months/five (5) years.

7.3.2. This warranty shall be in lieu of any other warranties, express or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose.

7.4. EXCLUSION OF WARRANTY

7.4.1. Warranty shall be excluded in cases where the products have not been used for the ordinary purposes or have been subject to abnormal conditions such as, but not limited to misuse, mishandling (such as, but not limited to, cuts, tears, vandalism, fire, wilful destruction, improper installation and/or improper maintenance, misapplication), use of unauthorized components or attachments or if adjustments or repairs have been performed by anyone other than MFC International Ltd or its authorized agents.

7.4.2. Warranty shall also be excluded and MFC International Ltd shall not be held liable in case of force majeure circumstances, such

as, but not limited to:

- war or threat of war, sabotage, insurrection, riots or requisition;

- all laws, restrictions, regulations, by-laws, prohibitions or any other measures by the governmental, parliamentary or local bodies;

- import and export regulations or embargo;

- strikes, lock-outs or other industrial measures or trade disputes (if including manufacturer's employees or third party);

- difficulties with supply of raw materials, work force, fuel, parts or machinery;

- power blackout, breakdown of machinery.

7.4.3. MFC International Ltd shall not be held liable for any deficiencies in products manufactured according to drawings, designs, project drafts and/or specifications provided by the purchaser.

7.4.4. Ordinary wear and tear is not covered by this warranty.

7.5. MAKING A WARRANTY CLAIM

7.5.1. The purchaser is obliged to take delivery of the products and perform an ordinary inspection of the product upon delivery.

7.5.2. Any claim by the purchaser with reference to the products shall be deemed waived unless submitted in writing to MFC International Ltd within the earlier of (I) eight days as of the discovery of the defect, or (II) sixty (60) months as of delivery of the product. Discovery of the defect is deemed to have occurred when a defect could have reasonably been detected by the purchaser.

7.5.3. Claim must at least contain the following data:

- part number,
- serial number,
- description of defect (including a photograph if possible) and how it occurred

Upon request, MFC International Ltd must be allowed to inspect the product.

7.5.4. To obtain performance under this warranty, any products suspected of having a manufacturing defect in materials or workmanship shall be returned freight prepaid for inspection to MFC International Ltd.

8. Stak Jak Chemical Compatibility

Use the following chemical compatibility table as a general guide only in determining the resistance to solvents, acids, salts and other chemical solutions of Stak Jak II lifting mats. Each substance is assigned an alpha character to denote its expected effect upon the Stak Jak. The specific ratings in the table are based for the most part upon published literature from various polymer suppliers, rubber manufacturers and in some cases, the considered opinion of experienced compounders. MFC International Ltd cannot guarantee their accuracy nor assume responsibility for use thereof.

Chemical effect rating:

A. - RECOMMENDED - Little or minor effect, long service may be expected with Suitable for continuous service.

B. - MINOR TO MODERATE EFFECT - still useful in many applications but properties will he affected by the exposure. Usually suitable for continuous and intermittent service.

C. - MODERATE TO SEVERE EFFECT - perhaps still useful in limited applications if exposure is limited or infrequent. Not recommended for continuous use but may give some service if it is the only option available.

U. - NOT RECOMMENDED

BLANK- NO DATA OR INSUFFICIENT EVIDENCE

The table positions which are not rated indicate insufficient information at the time of publication to determine an accurate rating.

A

Acetamide ..... B
Acetic Acid 5% ..... A
Acetic Acid 30% ..... A
Acetic Acid, Hot High Press C
Acetic Acid, Glacial ..... U
Acetic Anhydride ..... A
Acetone C
Acetophenone ..... U
Acetyl Acetone ..... U
Acetyl Chloride ..... U
Acetylene ..... B
Acetylene Tetrabomide ..... B
Acrylonitrile C
Adipic Acid ..... A
Aero Lubriplate ..... A
Aero Safe 2300 ..... U
Aero 2300W ..... U
Aero Shell IAC ..... B
Aero Shell 7A Grease ..... B
Aero Shell 17 Grease ..... B
Aero Shell 750 ..... U
Aerozene 50 (50% Hydrazine 50%UDMH) ..... U
Air Below 148.9°C (300°F) ..... A
Air Above 148.9°C (300°F) ..... U
Alkazene ..... U
Alum-N3Cr-K ..... A
Aluminium Acetate ..... B
Aluminium Bromide ..... A
Aluminium Chloride ..... A
Aluminium Fluoride ..... A
Aluminium Nitrate ..... A
Aluminium Phosphate ..... A
Aluminium Salts ..... A
Aluminium Sulfate ..... A
Ambrex 33 Mobil ..... B
Amines, Mixed ..... B
Ammonia Anhydrous (Liquid) ... A
Ammonia Gas, Cold ..... A
Ammonia Gas, Hot ..... B
Ammonia & Lithium Metal Solution ..... U
Ammonium Carbonate ..... A
Ammonium Chloride ..... A
Ammonium Hydroxide (Concentrate) ..... A
Ammonium Nitrate ..... A
Ammonium Nitrite ..... A
Ammonium Persulfate Solution A
Ammonium Persulfate 10% ..... A
Ammonium Phosphate ..... A
Ammonium Phosphate, Mono-Basic ..... A
Ammonium Phosphate, Dibasic A
Ammonium Phosphate, TribasicA
Ammonium Salts ..... A
Ammonium Sulfate ..... A
Ammonium Sulfide ..... A
Amyl Acetate ..... U
Amyl Alcohol ..... A
Amyl Borate ..... A
Amyl Chloride ..... U
Amyl Chloranaphthalene ..... U
Amyl Naphthalene ..... U
Anderol L-774 (diester) ..... U
Anderol L-826 (diester) ..... U
Anderol L-829 (diester) ..... U
Ang-25 (Glyceral Ester) ..... B
Ang-25 (di-ester Base) (TG749)U
Anhydrous Ammonia ..... A
Anhydrous Hydrazine ..... B
Anhydrous Hydrogen Fluoride .. U
Anline ..... U
Anline Dyes ..... B
Anline Hydrchloride ..... U
Anline Oils ..... U
Animal Fats ..... B
Animal Fats (Lard Oil) ..... B
AN-O-3 Grade M ..... B
An-O-6 ..... B
AN-O-366 ..... B
AN-VV-O-366b Hydr Fluid ..... B
Ansul Ether ..... U
Aqua Regia ..... U
Argon ..... U
Aroclor 1248 ..... U
Aroclor 1254 ..... U
Aroclor 1260 ..... A
Aromatic Fuel 50% ..... U
Arsenic Acid ..... A
Arsenic Trichloride ..... A
Askarel ..... U
Asphalt Emulsion ..... U
Asphalt Topping ..... B
ASTM Oil #1 ..... A
ASTM Oil #2 ..... B
ASTM Oil #3 ..... B
ASTM Oil #4 ..... U
ASTM Reference Fuel A ..... B
ASTM Reference Fuel B ..... U
ASTM Reference Fuel C ..... U
ATL-857 ..... U
Atlantic Dominion F ..... B
Aurex 903R Mobil ..... B
Automatic Transmission Fluid... B
Automotive Brake Fluid ..... B

B

Bardol B ..... U
Barium Chloride ..... A
Barium Hydroxide ..... A
Barium Salts ..... A
Barium Sulfate ..... A
Barium Sulfide ..... A
Bayol D ..... B
Beer ..... A
Beet Sugar Liquors ..... A
Benzaldehyde ..... U
Benzene ..... B
Benzenesulfonic Acid ..... A
Benzine ..... B
Benzochloride ..... U
Benzoic Acid ..... A
Benzophenol ..... U
Benzyl Alcohol ..... B
Benzyl Benzoate ..... U
Benzyl Chloride ..... U
Black Point 77 C
Black Suphate Liquors ..... A
Blast Furnace Gas ..... U
Bleach Solutions ..... U
Borax ..... A
Bordeaux Mixture ..... B
Boric Acid ..... A
Boron Fluids (HEF) ..... U
Brake Fluid (Non-Petroleum) .... B
Bray GG-130 ..... U
Brayco 7l9-R(WH-910) ..... B
Brayco 885 (MIL-L-6085A) ..... U
Brayco, 910 ..... B
Bret 710 ..... B
Brine ..... A
Brom-113 ..... U
Brom-114 ..... B
Bromine ..... U
Bromine Anhydrous ..... U
Bromine Pentafluoride ..... U
Bromine Trifluoride ..... U
Bromine Water ..... B
Bromobenzene ..... U
Bromochloro Trifluoroethane .... U
Bunker Oil ..... B
Butadiene ..... B
Butane ..... A
Butane 2, 2-Dimethyl ..... B
Butane 2, 3-Dimethyl ..... B
Butanol (Butyl Alcohol) ..... A
1-Butene, 2-Ethyl ..... U
Butter ..... B
Butyl Acetate ..... U
Butyl Acetate Ricinoleate ..... U
Butyl Acrylate ..... U

Butyl Alcohol ..... A
Butyl Amine..... U
Butyl Benzoate ..... U
Butyl Butyrate ..... U
Butyl Carbitol C
Butyl Cellosolve ..... U
Butyl Cellosolve Adipate ..... U
Butyl Ether ..... U
Butyl Oleate ..... U
Butyl Stearate ..... U
Butylene..... C
Butyraldehyde..... U
Butyric Acid..... U

C

Carbon Tetrachloride ..... U
Carbonic Acid ..... A
Castor Oil..... A
Cellosolve ..... U
Cellosolve Acetate ..... U
Cellosolve Butyl ..... U
Celloguard ..... A
Cellulube A60 (Now Fyrquel).... U
Cellolube 90,100,150,220,300, 500..... U
Cellutherm 2505A..... U
Cetane (Hexadecane) ..... B
China Wood Oil (Tung Oil)..... A
Chloracetic Acid..... A
Chlorodane C
Chlorextol ..... B
Chlorinated Salt Brine..... U
Chlorinated Solvents, Dry..... U
Chlorinated Solvents, Wet..... U
Chlorine, Dry..... C
Chlorine, Wet..... C
Chlorine Dioxide ..... U
Chlorine Dioxide (8% Cl as NACIO2 in solution)..... U
Chlorine Trifluoride ..... U
Chloroacetone C
Chloroacetic Acid..... U
Chlorobenzene ..... U
Chlorobenzene, (Mono)..... U
Chlorobromo Methane..... U
Chlorobutadiene ..... U
Chlorododecane ..... U
Chloroform..... U
O-Chloronaphthalene ..... U
1-Chloro 1-Nitro Ethane..... U
Chlorosulfonic Acid ..... U
Chlorotoluene ..... U
Chlorox ..... B
O-Chlorphenol ..... U
Chrome Alum..... A
Chrome Plating Solutions..... U
Chromic Acid ..... U
Chromic Oxides 88 Wt % Aqueous Solution ..... U
Circo Light Process Oil..... B
Citric Acid..... A
City Service Koolmotor-AP Gear Oil 140-E.P. lube..... B
City Service #65, #120, #250 ... B
Cobalt Chloride..... A
Cobalt Chloride, 2N ..... A
Cocoa nut Oil..... A
Cod Liver Oil..... B
Coffee ..... A
Coke Oven Gas..... U
Coliche Liquors..... A
Convelex 10..... U
Coolanol (Monsanto) ..... A
Copper Acetate..... B
Copper Chloride ..... A
Copper Cyanide..... A
Copper Salts..... A
Copper Sulfate..... A
Copper Sulfate 10% ..... A
Copper Sulfate 50% ..... A
Corn Oil ..... A
Cottonseed Oil..... A
Creosols ..... U
Creosote..... C
Creosote, Coal Tar..... B
Creosote, Wood Tar..... B
Creosylic Acid ..... U
Crude Oil ..... U
Cumene ..... U
Cutting Oil..... B
Cyclohexane..... U
Cyclohexanol ..... B
P-Cymene..... U

D

Decalin..... U
Decane ..... U
Delco Brake Fluid ..... B
Denatured Alcohol ..... A
Detergent Solutions ..... B
Developing Fluids (Photo) ..... A
Dextron ..... B
Diacetone ..... U
Diacetone Alcohol..... U
Diazon C
Dibenzyl Ether ..... U
Dibenzyl Sebacate..... U
Dibromoethyl Benzene ..... U
Dibutylamine..... U
Dibutyl Ether..... U
Dibutyl Phthalate ..... U
Dibutyl Sebacate ..... U
O-Dichlorobenzene..... U
P-Dichlorobenzene ..... U
Dichloro-Butane..... U
Dichloro-Isopropyl Ether ..... U
Dicyclohexylamine..... U
Diesel Oil ..... B
Di-Ester Lubricant MIL-L7808... U
Di-Ester Synthetic Lubricant ..... U
Diethylamine..... B
Diethyl Benzene ..... U
Diethyl Ether ..... U
Diethyl Sebacate ..... U
Diethylene Glycol..... A
Difluorodibromomethane ..... U
Disobutylene.....L
Disococtyl Sebacate..... U
Disopropyl Benzene ..... U
Disopropyl Ketone ..... U
Dimethyl Aniline ..... U
Dimethyl Formamide ..... U
Dimethyl Phthalate ..... U
Dinitro Toluene..... U
Dioetyl Phlltalate..... U
Dioetyl Sehaeate ..... U
Dioxane ..... U
Diozolane ..... U
Dipentene ..... U
Diphenyl..... U
Diphenyl Oxides ..... U
Dow Chemical 50-4 ..... B
Dow Chemical ET378..... U
Dow Chemical ET588..... B
Dow Corning-3..... A
Dow Corning-4..... A
Dow Corning-5..... A
Dow Corning-11..... A
Dow Corning-33..... A
Dow Corning-44..... A
Dow Corning-55..... A
Dow Corning-200..... A
Dow Corning-220..... A
Dow Corning 510..... A
Dow Corning 550..... A
Dow Corning-705..... A
Dow Corning-710..... A
Dow Corning-1208..... A
Dow Corning-4050..... A
Dow Corning-6620..... A
Dow Corning-F60 ..... A
Dow Corning-F61 ..... A
Dow Corning-XF60..... A

Dow Guard ..... A
Dowtherm Oil ..... U
Dowtherm A or E ..... U
Dowtherm 209, 50% Solution ... B
Drinking Water ..... B
Dry Cleaning Fluids ..... U
DTE Light Oil ..... B

E

Elco 28-EP Lubricant C
Epichlorohydrin ..... U
Epoxy Resins ..... A
Esam-6 Fluid ..... B
Esso Fuel 208 ..... B
Esso Golden Gasoline ..... U
Esso Motor Oil C
Esso Transmission Fluid (Type A) ..... B
Esso WS3812 (MIL-L-7808A) ... U
Esstic 42,43 ..... B
Ethane ..... B
Ethanol ..... A
Ethanol Amine ..... B
Ethers ..... U
Ethyl Acetate-Organic Ester ..... U
Ethyl Acetoacetate ..... U
Ethyl Acrylate ..... U
Ethyl Acrylic Acid ..... B
Ethyl Alcohol ..... A
Ethyl Benzene ..... U
Ethyl Benzoate ..... U
Ethyl Bromide ..... U
Ethyl Cellosolve ..... U
Ethyl Cellulose ..... B
Ethyl Chlorocarbonate ..... U
Ethyl Chloroformate ..... U
Ethyl Cyclopentane C
Ethyl Ether ..... U
Ethyl Formate ..... B
Ethyl Hexanol ..... A
Ethyl Mercaptan C
Ethyl Oxalate ..... U
Ethyl Pentachlorobenzene ..... U
Ethyl Silicate ..... A
Ethylene ..... A
Ethylene Chloride ..... U
Ehtylene Chlorohydrin ..... B
Ethylene Diamine ..... A
Ethylene Dibromide ..... U
Ethylene Dichloride ..... U
Ethylene Glycol ..... A
Ethylene Oxide ..... U
Ethylene Trichloride ..... U
Ethylmorpholene Stannous Octoate (50/50 Mixture) .....

F

F-60 Fluid (Dow Corning) ..... A
F-61 Fluid (Dow Corning) ..... A
Fatty Acids ..... B
FC-43 Heptacosofluorotributylamine ... A
FC75 Fluorocarbon ..... A
Ferric Chloride ..... A
Ferric Nitrate ..... A
Ferric Sulfate ..... A
Fish Oil ..... A
Fluoroboric Acid ..... A
Fluorine (Liquid) C
Fluorobenzene ..... U
Fluorocarbon Oils ..... A
Fluorolube ..... A
Fluorinated Cyclic Esters ..... U
Fluosilicic Acid ..... A
Formaldehyde C
Formic Acid ..... A
Freon, 11 ..... U
Freon, 12 ..... A
Freon, 12 and ASTM Oil #2 (50/50 Mixture) ..... B
Freon, 12 and Suniso 4G - (50/50 Mixture) ..... B
Freon, 13 ..... A
Freon 13B1 ..... A
Freon, 14 ..... A
Freon, 21 ..... B
Freon, 22 ..... A
Freon, 22 and ASTM Oil (50/50 Mixture) ..... B
Freon, 31 ..... A
Freon, 32 ..... A
Freon, 112 ..... B
Freon, 113 ..... A
Freon, 114 ..... A
Freon, 114B2 ..... A
Freon, 115 ..... A
Freon. 142b ..... A
Freon. 152a ..... A
Freon, 218 ..... A
Freon, C316 ..... A
Freon, C318 ..... A
Freon,502 ..... A
Freon, BF ..... B
Freon, MF ..... U
Freon, TF ..... A
Freon, TA ..... A
Freon, TC ..... A
Freon, TMC ..... B
Freon, T-P35 ..... A
Freon, T-WD602 ..... B
Freon, PCA ..... A
Fuel Oil ..... B
Fuel Oil, Acidic ..... B
Fuel Oil,#6 ..... U
Fumaric Acid ..... B
Fuming Sulphuric Acid - (20/25% Oleum) ..... U
Furan (Furfuran) ..... U
Furfural ..... B
Furfuraldehyde ..... B
Furfaryl Alcohol ..... U
Furyl Carbinol ..... U
Fryquel A60 ..... U
Fryquel 90, 100,150,220,300, 500 ..... U

G

Gallic Acid ..... B
Gasoline ..... B
Gelatin ..... A
Girling Brake Fluid ..... B
Glacial Acetic Acid ..... U
Glauber's Salt ..... A
Glucose ..... A
Glue (Depending on Type) ..... A
Glycerine-Glycerol ..... A
Glycols ..... A
Green Suphate Liquor ..... B
Gulfcrown Grease ..... B
Gulf Endurance Oils ..... B
Gulf FR Fluids (Emulsion) ..... B
Gulf FRG-Fluids ..... A
Gulf FRP-Fluids ..... U
Gulf Harmony Oils ..... B
Gulf High Temperature Grease. B
Gulf Legion Oils ..... B
Gulf Paramount Oils ..... B
Gulf Security Oils ..... B

H

Halothane ..... U
Hannifin Lube A ..... A
Heavy Water ..... B
HEF-2 (High Energy Fuel) ..... U
Helium ..... A
N-Heptane ..... B
N-Hexaldehyde ..... A
Hexane ..... B
N-Hexane-l ..... B
Hexyl Alcohol ..... B
High Viscosity Lubricant, U4 ..... B
High Viscosity Lubricant, H2 ..... B
Hilo MS #1 ..... U
Houghto-Safe 271 (Water and Glycol Base) ..... B
Houghto-Safe 620 (Water/Glycol) ..... B

Houghto-Safe 1010, Phosphate Ester ..... U
Houghto-Safe 1120, Phosphate Ester ..... U
Houghto-Safe 5040 (Water/Oil Emulsion) ..... B
Hydraulic Oil (Petroleum Base) B
Hydrazine ..... B
Hydrobromic Acid ..... U
Hydrobromic Acid 40% ..... B
Hydrocarbons (Saturated) ..... B
Hydrochloric Acid Hot 37% ..... U
Hydrochloric Acid Cold 37% ..... B
Hydrochloric Acid 3 Molar C
Hydrochloric Acid Concentrated ..... U
Hydrocyanic Acid ..... B
Hydro-Drive, MIH-50 (Petroleum Base)..... B
Hydro-Drive, MIH-10 (Petroleum Base)..... B
Hydrofluoric Acid, 65% Max.Cold ..... A
Hydrofluoric Acid, 65% Min.Cold ..... U
Hydrofluoric Acid, 65% Max.Hot C
Hydrofluoric Acid, 65% Min.Hot ..... U
Hydrofluosilicic Acid..... B
Hydrogen Gas, Cold ..... A
Hydrogen Gas, Hot..... A
Hydrogen Peroxide (1) ..... B
Hydrogen Peroxide 90%(1) ..... U
Hydrogen Sulfide Dry, Cold ..... A
Hydrogen Sulfide Dry, Hot ..... B
Hydrogen Sulfide Wet, Cold ..... A
Hydrogen Sulfide Wet, Hot ..... B
Hydrolube-Water/ Ethylene Glycol..... B
Hydroquinone ..... U
Hydyne ..... B
Hyjet ..... U
Hyjet III..... U
Hyjet S ..... U
Hyjet W ..... U
Hypochlorous Acid..... U

I

Industron FF44 ..... B
Industron FF48 ..... B
Industron FF53 ..... B
Industron FF80 ..... B
Iodine..... U
Iodine Pentafluoride..... U
Isobutyl Alcohol..... A
Iso-Butyl N-Butyrate ..... U
Isododecane ..... B
Iso-Octane ..... B
Isophorone (Ketone)..... U
Isopropanol..... A
Isopropyl Acetate ..... U
Isopropyl Alcohol ..... A
Isopropyl Chloride..... U
Isopropyl Ether ..... U

J

JP-3 (MIL-J-5624)..... U
JP-4 (MIL-J-5624)..... U
JP-5 (MIL-J-5624)..... U
JP-6 (MIL-J-25656)..... U
JPX (MIL-F-25604) ..... B

K

Kel F Liquids Kerosene C
Keystone #87HX-Grease..... U

L

Lactams-Amino Acids ..... B
Lactic Acid, Cold ..... A
Lactic Acid, Hot..... U
Lacquers..... U
Lacquer Solvents..... U
Lactic Acids..... A
Lard, Animal Fats..... B
Lavender Oil ..... U
Lead Acetate..... B
Lead Nitrate ..... A
Lead Sulfamate ..... A
Lehigh X1169..... B
Lehigh X1170..... B
Light Grease ..... U
Ligroin (Petroleum Ether or Benzine) ..... B
Lime Bleach..... B
Lime Sulphur ..... A
Lindol, Hydraulic Fluid (Phosphate Ester Type)..... U
Linoleic Acid..... U
Linseed Oil..... A
Liquid Oxygen..... U
Liquid Petroleum Gas (LPG) .... B
Liquimoly ..... B
Lubricating Oils, Diester C
Lubricating Oils, Petroleum Base ..... B
Lubricating Oils, SAE 10,20, 30,40,50..... B
Lye Solutions ..... A

M

Magnesium Chloride..... A
Magnesium Hydroxide..... B
Magnesium Sulfate..... A
Magnesium Sulfite ..... A
Magnesium Salts ..... A
Malathion .....
Maleic Acid ..... U
MCS 312..... U
MCS 352..... U
MCS 463..... U
Mercuric Chloride ..... A
Mercury..... A
Mercury Vapors ..... A
Mesityl Oxide (Ketone) ..... U
Methane..... B
Methanol..... A
Methyl Acetate ..... B
Methyl Acetoacetate ..... U
Methyl Acrylic Acid..... B
Methyl Alcohol ..... A
Methyl Benzoate..... U
Methyl Bromide..... U
Methyl Butyl Ketone..... U
Methyl Carbonate ..... U
Methyl Cellosolve ..... B
Methyl Chloride..... U
Methyl Chloroformate ..... U
Methyl D-Bromide..... U
Methyl Cyclopentane ..... U
Methylene Chloride..... U
Methyl Dichloride ..... U
Methyl Ether C
Methyl Ethyl Keton (MEK) ..... U
Methyl Ethyl Ketone Peroxide .. U
Methyl Formate..... B
Methyl Isobutyl Ketone (MIBK) . U
Methyl Isopropyl Ketone ..... U
Methyl Methacrylate ..... U
Methyl Oleate ..... U
Methyl Salicylate..... U
MIL-L-644B..... C
MIL-L-2104B..... A
MIL-L-2105B..... A
MIL-G-2108 ..... A
MIL-S-3136B,Type I Fuel..... B
MIL-S-3136B,Type II Fuel..... U
MIL-S-3136B,Type III Fuel..... U
MIL-S-3136B,Type IV ..... A
MIL-S-3136B,Type V ..... B
MIL-S-3136B,Type VI ..... U
MIL-S-3136B,Type VII C
MIL-L-3150A..... B
MIL-G-3278 ..... U
MIL-L-3503 ..... B
MIL-L-3545B..... B
MIL-C-4339C ..... U
MIL-G-4343B ..... B
MIL-L-5020A..... B
MIL-J-5161F ..... U

MIL-C-5545A ..... B
MIL-H-5559A ..... B
MIL-F-5566 ..... B
MIL-G-5572 ..... U
MIL-F-5602 ..... B
MIL-H-5606B ..... B
MIL-J-5624G, JP-3 ..... U
MIL-J-5624G, JP-4 ..... U
MIL-J-5624, JP-5 ..... U
MIL-L-6081C ..... B
MIL-L-6082C ..... B
MIL-H-6083C ..... B
MIL-L-6085A ..... U
MIL-L-6086B ..... A
MIL-A-6091 ..... A
MIL-L-6387 ..... A
MIL-C-6529C ..... B
MIL-F-7024A ..... U
MIL-H-7083A ..... B
MIL-G-7118A C
MIL-G-7187 ..... U
MIL-G-7421A C
MIL-H-7644 ..... B
MIL-L-7645 ..... B
MIL-G-7711A ..... U
MIL-L-7808F ..... U
MIL-L-7870A ..... B
MIL-C-8188C ..... U
MIL-A-8243B ..... B
MIL-L-8383B ..... A
MIL-H-8446B ..... B
MIL-I-8660B ..... A
MIL-L-9000F ..... B
MIL-T-9188B ..... U
MIL-L-9236B ..... U
MIL-E-9500 ..... A
MIL-L-10295A ..... B
MIL-L-10324A ..... B
MIL-G-10924B ..... U
MIL-L-11734B C
MIL-O-11773 C
MIL-P-12098 ..... B
MIL-H-13862 ..... B
MIL-H-13866A ..... B
MIL-H-13910B ..... B
MIL-H-13919A ..... B
MIL-L-14107B ..... A
MIL-L-15016 ..... B
MIL-L-15017 ..... B
MIL-L-15018B ..... A
MIL-L-15019A ..... A
MIL-L-15719A ..... B
MIL-G-15793 C
MIL-F-16884 C
MIL-F-16929 ..... A
MIL-L-16958A ..... B
MIL-F-17111 ..... B
MIL-L-17331D ..... B
MIL-L-17353A C
MIL-L-17672B ..... A
MIL-L-18486A ..... A
MIL-G-18709A ..... A
MIL-H-19457B ..... U
MIL-F-19605 C
MIL-L-19701 C
MIL-L-2126- ..... B
MIL-G-21568A ..... A
MIL-H-22072 ..... B
MIL-H-22251 ..... B
MIL-L-22396 ..... A
MIL-L-23699A C
MIL-G-23827A C
MIL-G-25013D ..... B
MIL-F-25172 C
MIL-L-25336B C
MIL-F-25524A C
MIL-G-25537A ..... B
MIL-F-25558B ..... B
MIL-F-25576C C
MIL-H-25598 ..... B
MIL-F-25656B ..... U
MIL-L-25681C ..... B
MIL-G-25760A C
MIL-L-25968 C
MIL-L-26087A ..... A
MIL-G-27343 ..... A
MIL-P-27402 ..... B
MIL-H-27601A ..... B
MIL-G-27617
MIL-I-27686D ..... B
MIL-L-27694A ..... A
MIL-L-46000A C
MIL-H-46001A ..... A
MIL-L-46002 ..... A
MIL-H-46004 ..... B
MIL-P-46064A ..... B
MIL-H-81019B ..... B
MIL-S-81087 ..... A
MIL-H-83282 ..... B
Milk ..... A
Mineral Oils ..... A
Mobil 24 DTE ..... B
Mobil HF ..... B
Mobil Delvac 1100, 1110, 1120, 1130 ..... B
Mobil Nivac 20 and 30 ..... A
Mobil Velocite C ..... B
Mobilgas WA200, Type Automatic Trans. Fluid ..... B
Mobil Oil SAE 20 ..... B
Mobiltherm 600 ..... B
Mobilux ..... B
Mono Bromobenzene ..... U
Mono Chlorobenzene ..... U
Mono Ethanolamine ..... U
Monomethyl Aniline ..... U
Monmethyl Ether ..... A
Monmethyl Hydrazine ..... B
Monoitroluene & Dinitrotoluene (40/60 Mix.) ..... U
Monovinyl Acetylene ..... B
Mopar Brake Fluid ..... B
Mustard Gas ..... A

N

Naptha ..... U
Napthalene ..... U
Napthalenic Acid ..... U
Natural Gas ..... A
Neatsfoot Oil ..... U
Neon ..... A
Neville Acid ..... U
Nickel Acetate ..... B
Nickel Chloride ..... B
Nickel Salts ..... B
Nickel Sulfate ..... A
Niter Cake ..... A
Nitric Acid (1) 3 Molar ..... U
Nitric Acid (1) Concentrated ..... U
Nitric Acid Dilute ..... B
Nitric Acid (1) Red fuming (RFNA) ..... U
Nitric Acid (1) Inhibited, Red fuming (IRFNA) ..... U
Nitrobenzene ..... U
Nitrobenzine ..... U
Nitroethane C
Nitrogen ..... A
Nitrogen(Tetroxide(N2O4)(1)) ..... U
Nitromethane C
Nitropropane ..... U

O

O-A-548A ..... B
O-T-6324b ..... U
Octachloro toluene ..... U
Octadecane ..... B
N-Octane ..... U
Octyl Alcohol ..... B
Oleic Acid C
Oleum (Fuming Sulfuric Acid) ..... U
Oleum Spirits C
Olive Oil ..... B

Oronite 8200 ..... A
Oronite 8515 ..... A
Orthochloro Ethyl Benzene ..... U
Ortho-Dichlorobenzene ..... U
OS 45 Type lll(OS45) ..... A
OS 45 Type IV(OS45-1) ..... A
OS70 ..... A
Oxalic Acid ..... B
Oxygen, Cold ..... A
Oxygen, Cold 93°C - 204°C (200°F - 400°F) ..... U
Ozone C

P

P-S-661b C
P-D-680 C
Paint Thinner, Duco ..... U
Palmitic Acid ..... B
Para-dichlorobenzene ..... U
Par-al-Ketone ..... U
Parker O Lube ..... A
Peanut Oil ..... B
Pentane,2 Methyl ..... B
Pentane,2-4 Dimethyl ..... B
Pentane,3 Methyl ..... B
N-Pentane ..... A
Perchloric Acid ..... B
Perchloroethylene ..... U
Petroleum Oil, Crude ..... B
Petroleum Oil, Below 121.1°C (250°F) ..... B
Petroleum Oil, Above 121.1°C (250°F) ..... U
Phenol ..... U
Phenol, 70%/30% H2O ..... U
Phenol, 85%/15% H2O ..... U
Phenylbenzene ..... U
Phenyl Ethyl Ether ..... U
Phenyl Hydrazine ..... U
Phorone ..... U
Phosphoric Acid 20% ..... B
Phosphoric Acid 45% ..... B
Phosphoric Acid, 3 Molar C
Phosphoric Acid, Concentrated U
Phosphorous Trichloride Acid ... U
Pickling Solution ..... U
Picric Acid, H2O Solution ..... B
Picric Acid, Molten ..... U
Pinene C
Pine Oil ..... U
Piperidine ..... U
Plating Solutions, Chrome ..... U
Plating Solutions, Others
Pneumatic Service ..... A
Polyvinyl Acetate Amulsion ..... B
Potassium Acetate ..... B
Potassium Chloride ..... A
Potassium Cupro Cyanide ..... A
Potassium Cyanide ..... A
Potassium Dichromate ..... A
Potassium Hydroxide ..... A
Potassium Nitrate ..... A
Potassium Salts ..... A
Potassium Sulfate ..... A
Potassium Sulfite ..... A
Prestone Antifreeze ..... A
PRL-High Temp. Hydr. Oil ..... B
Producer Gas ..... B
Propane ..... B
Propane Propionitrile ..... B
Propyl Acetate ..... U
N-Propyl Acetone ..... U
Propyl Alcohol ..... A
Propyl Nitrate ..... U
Propylene Oxide ..... U
Pyranol, Transformer Oil ..... B
Pyranol ..... U
Pydraul, 10E, 29ELT ..... U
Pydraul, 30E, 50E, 65E, 90E .... U
Pydraul, 115E ..... U
Pydraul, 230E, 312C, 540C ..... U
Pyridine Oil ..... U
Pyrogard, C, D ..... B
Pyrolingneous Acid ..... U
Pyrolube ..... U
Pyrrole ..... U

R

Radiation C
Rapeseed Oil ..... B
Red Oil (MIL-H-5606) ..... B
Red Line 100 Oil ..... B
RJ-1(MIL-F-25558) ..... B
RP-1(MIL-R-25576) ..... B

S

Sal Ammoniac ..... A
Salicylic Acid C
Salt Water ..... A
Santo Sale 300 ..... U
Sewage ..... B
Shell Alvania Grease #2 ..... B
Shell Carnea 19 and 29 ..... U
Shell Diala ..... B
Shell Iris 905 ..... A
Shell Iris 3XF Mine Fluid (Fire Resist Hydr) ..... B
Shell Iris Tellus #27, Pet. Base . B
Shell Iris Tellus #33 ..... B
Shell Iris UMF (5% Aromatic) ... B
Shell Lo Hydrax 27 and 20 ..... B
Shell Macoma 72 ..... B
Silicate Esters ..... A
Silicone Greases ..... A
Silicone Oils ..... A
Silver Nitrate ..... A
Sinclair Opaline CS-EP Lube ... B
Skelly, Solvent B, C, E ..... U
Skydrol 500 ..... U
Skydrol 7000 ..... U
Soap Solutions ..... A
Socony Vacuum AMV AC781 (Grease) ..... B
Socony Vacuum PD959B ..... B
Soda Ash ..... A
Sodium Acetate ..... B
Sodium Bicarbonate (Baking Soda) ..... A
Sodium Bisulfite ..... A
Sodium Borate ..... A
Sodium Carbonate (Soda Ash). A
Sodium Chloride ..... A
Sodium Cyanide ..... A
Sodium Hydroxide ..... B
Sodium Hypochlorite ..... B
Sodium Metaphosphate ..... B
Sodium Nitrate ..... B
Sodium Perborate ..... B
Sodium Peroxide ..... B
Sodium Phosphate (Mono) ..... B
Sodium Phosphate (Dibasic) .... A
Sodium Phosphate (Tribasic) ... B
Sodium Salts ..... B
Sodium Silicate ..... A
Sodium Sulfate ..... A
Sodium Sulfide ..... A
Sodium Sulfite ..... A
Sodium Thiosulfate ..... A
Sovasol #1, 2 and 3 ..... B
Sovasol #73 and 74 ..... B
Soybean Oil ..... A
Spry ..... B
SR-6 Fuel ..... U
SR-10 Fuel ..... U
Standard Oil Mobilube GX90-EP Lube ..... B
Stannic Chloride ..... B
Stannic Chloride 50% ..... U
Stannous Chloride ..... A
Stauffer 7700 ..... U
Steam, Below 176.7°C (350°F) U
Steam, Above 176.7°C (350°F) U
Stearic Acid ..... B
Stoddard Solvent C
Styrene ..... U

Styrene (Monomer)..... U
Sucrose Solutions..... A
Sulfite Liquors..... B
Sulfur ..... A
Sulfur Chloride..... U
Sulfur Dioxide, Wet..... B
Sulfur Dioxide, Dry..... U
Sulfur Dioxide, Liquefied under pressure..... U
Sulfur Hexaflouride ..... A
Sulfur Liquors ..... B
Sulfur Molten C
Sulfur Trioxide..... U
Sulfuric Acid Dilute..... B
Sulfuric Acid Concentrated ..... U
Sulfuric Acid 20% Oleum ..... U
Sulfuric Acid 3 Molar..... C
Sulfurous Acid..... B
Sunoco SAE 10 ..... B
Sunoco #3661 ..... B
Sunoco All Purpose Grease ..... B
Sunsafe(Fire Resist Hydr.Fluid) B
Super Shell Gas ..... B
Swan Finch EP Lube ..... U
Swan Finch Hypoid-90 ..... B

T

TT-N-95a C
TT-N-97B C
TT-I-735b ..... B
TT-S-735,Type I..... B
TT-S-735,Type II..... C
TT-S-735,Type III..... C
TT-S-735,Type IV ..... A
TT-S-735,Type V ..... B
TT-S-735,Type VI ..... B
TTT-656b ..... U
Tannic Acid ..... B
Tannic Acid 10% ..... A
Tar Bituminous..... C
Tanaric Acid ..... A
Terpineol ..... U
Tertiary Butyl Alcohol ..... B
Tertiary Butyl Catechol..... B
Tertiary Butyl Mercaptan..... U
Tetrabromomethane ..... U
Tetrabutyl Titanate ..... B
Tetrachloroethylene ..... U
Tetraethyl Lead C
Tetraethyl Lead “Blend” ..... U
Tetrahydrofuran ..... U
Tetralin ..... U
Texaco 3450 Gear Oil..... U
Texaco Capella A and AA..... B
Texaco Meropa #3..... B
Texaco Regal B ..... U
Texaco Uni-Temp Grease ..... B
Texamatic “A” Transmission Oil B
Texamatic 1581 Fluid..... B
Texamatic 3401 Fluid..... B
Texamatic 3525 Fluid..... B
Texamatic 3528 Fluid..... B
Texas 1500 Oil..... B
Thiokol TP-908 ..... B
Thiokol TP-95 ..... B
Thionyl Chloride..... U
Tidewater Oil-Beedol ..... B
Tidewater Oil-Multigear 140, EP Lube..... B
Titanium Tetrachloride ..... U
Toluene ..... U
Toluene Diisocyanate ..... U
Transformer Oil..... B
Transmission Fluid Type A..... B
Triacetin ..... B
Triayl Phosphate..... U
Tributoxyethyl Phosphate ..... U
Tributyl Mercaptan..... U
Tributyl Phosphate..... U
Trichloroacetic Acid ..... U
Trichloroethane..... U
Trichloroethylene ..... U
Tricresyl Phosphate..... B
Triethanol Amine..... U
Triethyl Aluminum ..... U
Triethyl Borane ..... U
Triflouroethane ..... U
Trinitrotoluene..... A
Trioctyl Phosphate..... U
Tripoly Phosphate..... B
Tung Oil (China Wood Oil)..... B
Turbine Oil ..... U
Turbine Oil #15 (MIL-L-7808A). U
Turbine Oil #35 ..... B
Turpentine ..... U
Type I, Fuel (MIL-S-3136)..... B
Type II Fuel (MIL-S-3136)..... U
Type III Fuel (MIL-S-3136)..... U

U

Ucon Hydrolube J-4..... B
Ucon Lubricant LB-65..... A
Ucon Lubricant LB-135..... A
Ucon Lubricant LB-285..... A
Ucon Lubricant LB-300..... A
Ucon Lubricant LB-625..... A
Ucon Lubricant LB-1145 ..... A
Ucon Lubricant 50-HB55 ..... A
Ucon Lubricant 50-HB100 ..... A
Ucon Lubricant 50-HB260 ..... A
Ucon Lubricant 50-HB660 ..... A
Ucon Lubricant 50-HB5100 ..... A
Ucon Oil LB-385 ..... A
Ucon Oil LB400X..... A
Ucon 50-HB-280X (Polyacrylon Glycol Deriv.) ..... A
Univis 40 (Hydr. Fluid) ..... B
Univolt #35 (Mineral Oil)..... B
Unsymmetrical Dimethyl Hydrazine (UDMH) ..... B

V

VV-B-680 ..... B
VV-G-632..... A
VV-G-671c..... A
VV-H-910..... B
VV-I-530a..... B
VV-K-211d C
VV-K-220a ..... B
VV-L-751b..... B
VV-L-800..... B
VV-L-820b..... B
VV-L-825a, Type I..... A
VV-L-825a, Type II..... A
VV-L-825a, Type III..... B
VV-O-526..... A
VV-P-2l6a ..... B
VV-P-236 ..... B
Varnish..... U
Vegetable Oil C
Versilube..... A
Vinegar ..... B
Vinyl Chloride ..... U

W

Wagner 21B Brake Fluid ..... B
Water ..... A
Wemco C..... B
Whiskey and Wines..... A
White Pine Tar ..... U
White Oil..... B
Wolmar Salt..... B
Wood Alcohol..... A
Wood Oil..... B

X

Xylene..... U
Xylidenes-Mixed-Aromatic Amines..... U
Xylol..... U
Xenon ..... A

Z

Zeolites ..... A
Zinc Acetate..... B
Zinc Chloride ..... A
Zinc Salts..... A
Zinc Sulfate..... A

9. Stak Jak Test Report

The report shown below details testing carried out by MFC International or an authorised representative only.

MFC International by RESPIREX
ENGINEERED INFLATABLE PRODUCT SOLUTIONS

High Pressure Lifting Bag - Test Report

Size:_____ Serial Number:_____

		OK
- Hydro pressure test (1.5 x WP @ 10 mins)		☐
- Air pressure test (WP @ 10 mins)		☐
- Leakage check	~ Bag	☐
	~ Valve	☐
- Visual check	~ No irregularities on the surface	☐
	~ No irregularities on the edge	☐
- Label	~ Straight	☐
	~ Not damaged	☐
- Serial number	~ Correct position	☐
	~ Readable	☐

Approved: **Yes** ☐ **No** ☐

Test date:_____ **Test Stamp:**_____

MFC International
by RESPIREX

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