

Alcoa
Fastening
Systems



INSTRUCTION MANUAL

940AB POWERIG

AIR POWERED HYDRAULIC UNIT



Makers of Huck[®], Marson[®], Recoil[®]
Brand Fasteners, Tools & Accessories



09-12-2009
Form HK 604

HUCK® 940AB Air Driven Hydraulic Powerig®

NOTICE

THIS MANUAL APPLIES TO MODEL 940AB

SAFETY

An important notice:

Operator must read and understand any WARNING and Caution stickers/labels supplied with equipment before connecting equipment to any primary power supply - - as applicable, the following sections each have specific safety, and other, information:

- *WARNINGS and CAUTIONS*
- *DESCRIPTION*
- *SPECIFICATIONS*
- *PRINCIPLE OF OPERATION*
- *PREPARATION FOR USE*
- *PREVENTIVE MAINTENANCE*
- *OPERATION AND TOOL HANDLING*

As applicable, the disassembly and assembly sections contain specific overhaul and safety procedures.

Only persons who have read and understood all applicable manuals or received training approved by Alcoa Fastening Systems (AFS) will be able to use Huck equipment with personal safety and efficiency.

If you require additional information, contact your local Huck representative or the nearest office listed on the back cover.

SAFETY GLOSSARY

WARNINGS must be understood to avoid severe personal injury.
Cautions show conditions that will damage equipment and/or structure.

Notes are reminders of required procedures

Italic type and underlining strengthens a specific instruction.

WARNINGS

When operating Huck installation equipment always wear approved eye protection. Whenever within the working environment, wear approved eye

protection, with side shields, to protect from anything that breaks on the fastening system including: Erupting fluid lines, flying fastener particles or any other dirt/debris that could cause eye injury.

Disconnect primary power source before doing maintenance on Huck equipment.

Follow lockout/tagout procedures in force by your employer.

- For equipment powered by compressed air, disconnect the air hose before doing any maintenance.
- For hydraulic tools, or other hydraulic equipment, disconnect the hydraulic hoses from the hydraulic unit before doing any maintenance.

If any equipment shows signs of damage or leakage, **DO NOT** connect it to the primary power supply (either electrical or compressed air) - - and do not continue to use equipment that develops erratic symptoms. If equipment is damaged, or there are other serious discrepancies, affected equipment may rupture violently - - parts may strike the operator, and/or other personnel, and cause severe personal injury. Ensure that **ALL** air and/or hydraulic hose and/or electrical plugs/connectors are correctly connected before switching on power supply to equipment. If incorrectly connected, the tool may respond erratically and cause severe personal injury.

SPECIFICATIONS

Weight	70 lbs	31.8kg
Height	21.7 in	550mm
Length	21.7 in	550mm
Width	21.7 in	550 mm

- Note specifications include protective Rollcage

Pressure setting as shipped:

RETURN 2,200 -2,400 psi 15,200 -16,500 kPa

PULL 5,400 -5,700psi 37,200 -39,300 kPa

Reservoir Capacity 2.6 gallons 9.8 liters

Minimum Operating Temperature (ambient) 18°C

Maximum Hydraulic Fluid Temperature 150°F 65°C

Hydraulic Fluid is not supplied by Huck. Use automatic transmission fluid, DEXTRON III, or equivalent. Fire-resistant hydraulic fluid must be used to comply with OSHA regulation 1926.302 paragraph (d): "the fluid used in hydraulic power tools shall be fire resistant fluid approved under Schedule 30 of the US Bureau of Mines, Department of Interior, and shall retain its operating

characteristics at the most extreme temperatures to which it will be exposed." Fluid viscosity 300 SUS @ 1000F and 50 SUS @ 210°F is recommended for ambient temperatures 0 to 130°F.

Before using equipment

- (1) Only Huck Installation Equipment should be used to install Huck Fasteners.
- (2) Only persons that have received training should use Huck Installation Equipment.
- (3) The Manuals and/or Data sheets and warning stickers/labels supplied with this Installation equipment should be studied before connecting the equipment to any primary power supply, in particular the following sections.
 - Warnings and Cautions.
 - Specifications.
 - Electrical and/or Air supply.
 - Principals of Operation.
 - Preparation for use.
 - Regular use.
 - Regular maintenance.
- (4) With hydraulic tooling, ensure that it is suitable for use with the Huck Powerig or Huck approved hand pump being used and oil levels are at the correct levels.
- (5) Check that the Powerig or approved hand pump "Pull" and "Return" pressures have been adjusted to suit the tool being used. Reference must be made to use instruction manual supplied with the equipment.
- (6) Check that the Nose Assembly is of the correct type suitable for installing to the fastener being used.
- (7) Visually check all pneumatic and/or hydraulic hoses, electrical cables, power packs, hand pumps and hand tools, for any visible signs of damage and leakage.
- (8) Do not connect any equipment to primary power supplies or attempt to use any equipment, that shows signs of damage or leakage.
- (9) Ensure that all air and/or hydraulic hose and/or electrical plugs/connectors are correctly connected **before** switching on supply to equipment.

When operating the equipment

- 1) When using fasteners in some types of structure, the fracturing of the pintail during installation may generate noise levels above the first action level of the Noise at Work Regulations and therefore hearing protection must be worn.
- 2) It is recommended that eye protection, (eg. Safety glasses), should be worn by the operator.

Never look directly at the front or rear of the installation tool.

- 3) Never hold the Installation Tool around the Nose Assembly.
- 4) Keep hands/fingers clear of any moving parts and also apertures in Nose Assemblies.

Warning

Fasteners should only ever be installed in the actual work piece to prevent possible high velocity from the Nose Assembly due to tensile forces induced during pintail fracture.

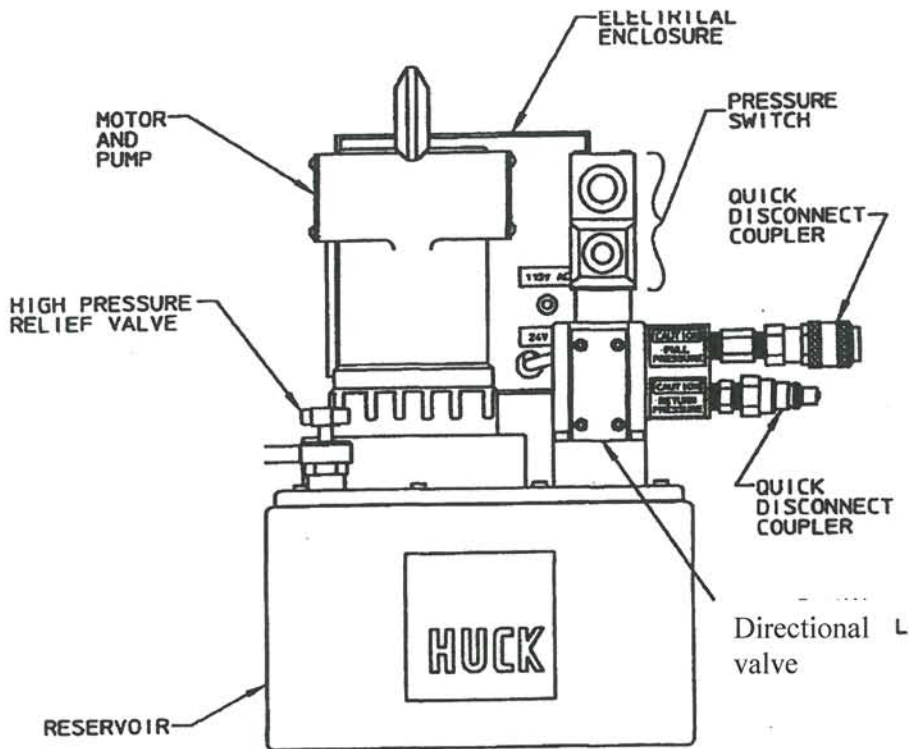
- (5) When using two piece fasteners, (i.e Pin and Collar type), the conical/chamfered end of the collar **MUST** always be towards the Nose Assembly, NOT against the work piece.
- (6) Keep fingers clear from the underside of the head, collars and blind side of fasteners and from within the joint being fastened, during the installation cycle.
- (7) Do not look directly at the head or blind side of fasteners during the installation cycle.

During the installation cycle, the tool will pull and straighten itself to the axis of the fastener, beware of hands being trapped against any nearby structure.

KEEP HANDS CLEAR

- (8) In the event of any difficulty whilst installing a fastener, releasing the tool trigger at any time during the installation cycle will immediately put the tool into reverse.
- (9) Beware of fastener pintails which are ejected, (sometimes forcibly), from the tool at the completion, or at pintail fracture, during the installation cycle.
- (10) Do not** continue to use any equipment which develops a fault whilst being used.
- (11) Avoid kinking of hoses or dragging of hoses and electrical cables over sharp objects.

HUCK 940AB Air Powerig Overview



- (1) Model 940AB Powerig Hydraulic Unit is a portable (2 man lift), air operated power source designed to operate all HUCK hydraulic installation equipment.
- (2) The HUCK air driven powerig is a single unit with an air motor. The motor drives a hydraulic pump which sits within the oil reservoir. The unit also consists of a 12V DC switching circuit to control the operation of the hydraulic and pneumatic components. As well as the Pull (install) and Return cycles of the tools.
- (3) An electrical enclosure contains a 12V DC sealed lead acid battery, relays and a battery charging arrangements.
- (4) Hydraulic pressure is developed by a two-stage, gear, piston pump driven by a 1.5hp air motor.
- (5) Pressurised fluid is directed by a two position directional control valve to either the PULL port or the RETURN port of the installation equipment. The directional control valve is operated by the 12V DC control circuit.



- (6) The external high pressure relief valve controls PULL pressure and is adjustable by the operator. (To be set to the minimum pressure required to operate the tool.)
- (7) An internal relief valve is preset at the factory to protect the operator and equipment. The internal relief is not adjustable by the operator.
- (8) A pressure switch controls RETURN pressure and turns off the Powerig hydraulic unit at the end of an installation cycle.
- (9) Hydraulic fluid is stored in the reservoir which also serves as the base. Remove the filler cap/dipstick to check fluid level and to add fluid.
- (10) Hydraulic quick disconnect couplers are fitted for connecting hoses from installation equipment.

Power Source and Control Features

- (1) The air driven Powerig is to be connected to a compressed air outlet capable of 80 - 100PSI and 15CFM. An in-line water-trap, oiler filter is recommended.
- (2) Normal trigger operation from the installation tooling, provides the switching circuit for the 12V DC operation of the control circuit.
- (3) The 12V DC battery located in the electrical control box is rechargeable.
- (4) To charge the battery, connect the 10A 240V lead to an authorised outlet. Connect the 12V DC charging lead to the internal coupler located in the electrical control box. *(Figure 2.4.1)* The charging unit will indicate the correct level of charge by the inbuilt LED's. Alternately when specified an on board battery charger maybe included in the control box.



- (5) Charging of the battery should be conducted after each day of use, or every 14 days to ensure correct battery condition and charge.

NB: Charging of the battery can only be conducted with the door of the control cabinet open. (Figure 2.6.1), (Figure 2.6.2)

The battery is sealed, and is allowable to be used at varying angles. However, charging should be done with battery on a level plane.



Principal of Operation

Operation of the installation tooling has not changed. The trigger button of the tools still instigates the operation of the electrical control circuit. In this instance circuit operates on 12V DC.

When the trigger of the tool is depressed relay contacts close and the control circuit energizes a solenoid coil, the pneumatically piloted Directional control valve shifts, and pressurized fluid is directed to the PULL pressure port of the installation equipment.

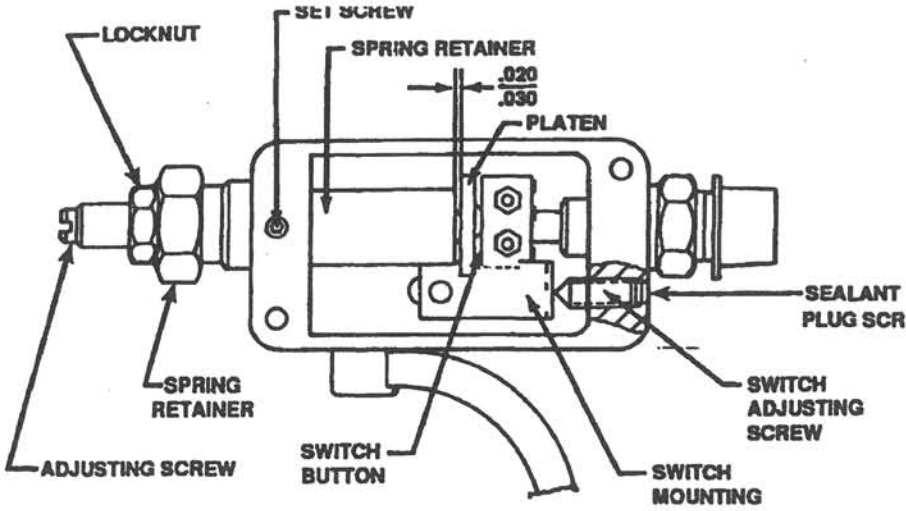
When the tool trigger switch is released, the relay contacts open. The original solenoid coil is de-activated and the return pressure solenoid is activated. Pressurized fluid is directed to the RETURN pressure port of the installation equipment.

The motor solenoid relay is held closed until the preset RETURN pressure is reached and pressure switch (PS) contacts open. The Motor Solenoid de-energizes and the motor turns off. With the motor no longer driving the pump, the pressure drops, and pressure switch returns to the closed (normal) position.

NB: Air supply to the Powerig should not be interrupted or disconnected whilst tooling is in any phase of operation.

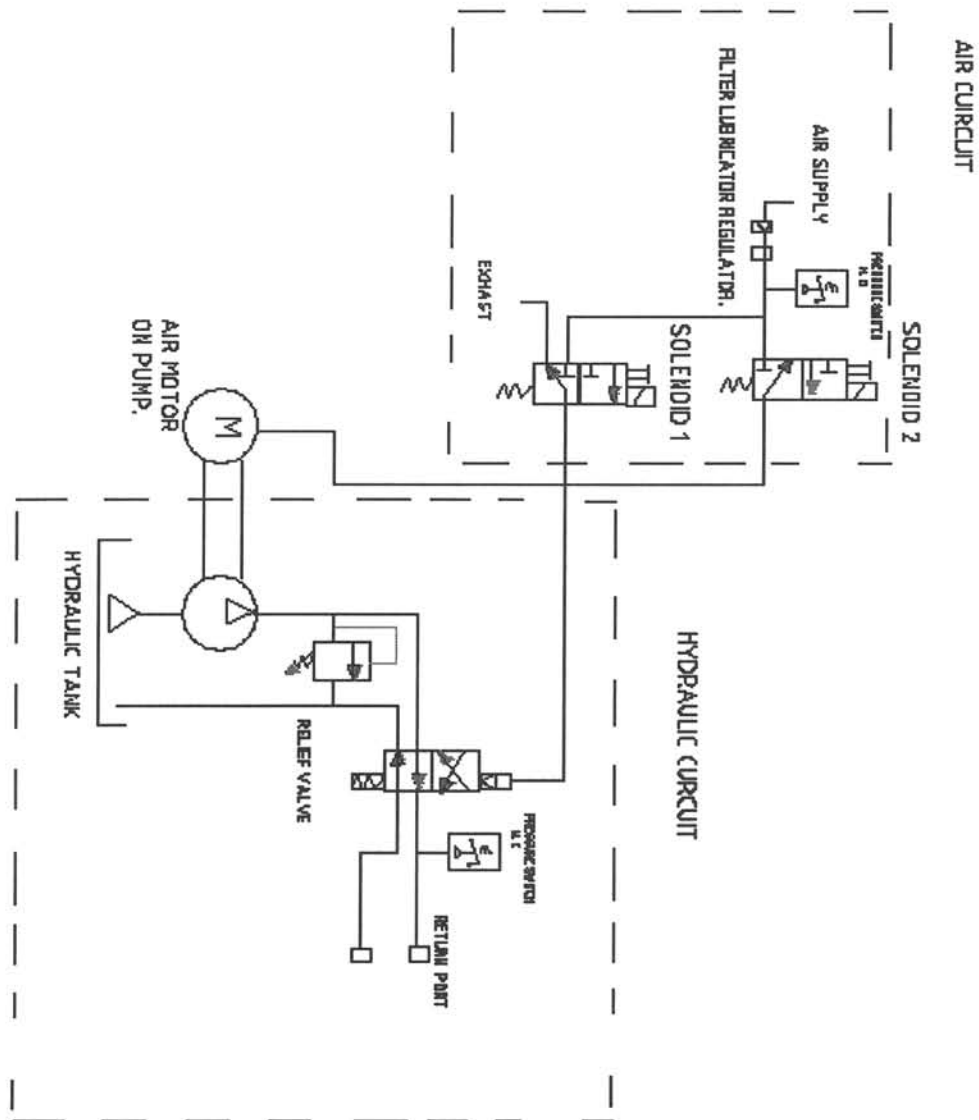
If this happens the tool may not complete it's cycle and will be out of position when equipment is next actuated.

Return Pressure Switch



Maintenance

This Unit should only be serviced or repaired by a qualified agent. Please refer to AFS or authorised distributor for further information



The above drawing illustrates the use of diodes across the contacts of the relays to eliminate arcing as the magnetic field in the solenoids collapses.

The dotted lines indicate add on features like the on board battery charger and air turbine generator. These components are not necessary to make the machine operate. The machine can be constructed without these two features. Their purpose is only to make the machine a stand alone item that can provide continuous use.

Parts list:

OTC Air driven Hydraulic pump p/n PA554

OTC Air Piloted Hydraulic
Directional control Valve p/n 9594

Solenoid valve for control of
Directional control Valve.
Must be 2 position 3 way valve
12VDC

Solenoid valve for control of
Air motor. 2 position 3 way valve

Electrical components and add on modules not listed.

Trouble Shooting

Trouble	Probable Cause
1. Motor fails to start when tool switch is depressed.	(a) Loose or defective control cord or connectors. (b) Fuse blown. (c) Defective tool switch. (d) Loose wire(s). (e) Defective relay. (f) Insufficient Air pressure (g) Defective motor solinoid. (h) Air pressure supply sensor set too high
2. Motor runs, but tool will not reciprocate.	(a) Hoses not coupled properly. (b) Hydraulic fluid viscosity not proper or level is low. (c) Defective pilot valve solenoid or coil. (d) Unloading valve missing in tool. (e) Bind in tool or nose assembly. (f) Defective directional valve. (g) Pump to motor coupling damaged.
3. Pintail of fastener fails to break off.	(a) PULL pressure set too low. (b) Worn or defective hose couplers. (c) Hydraulic fluid viscosity not proper or level is low. (d) Hydraulic fluid overheated. (e) Worn or defective directional valve. (t) Internal relief valve set too low or defective. (g) Worn or defective pump.
4. Tool will not return when switch is released. (Tool	(a) RETURN pressure set too low.

will not push nose assembly off swaged fastener.)	(b)Hoses not coupled properly. (c)Worn or defective solenoid. (d) Worn or defective pilot valve.
5.Motor fails to shut-off when installation cycle is completed.	(a)RETURN pressure switch set too high. (b)Hydraulic fluid viscosity not proper or level is low. (c)Hydraulic fluid overheated. (d)Defective limit switch in pressure switch assembly.
6.Pump making noise throughout entire cycle,	(a)Pump is cavitating-fluid level may be low or fluid viscosity too heavy. (b)Strainer is dirty and clogged
7.Tool operation slow -entire cycle does occur.	(a)Pump is cavitating-fluid level may be low or fluid viscosity is too heavy. (b)Strainer is dirty and clogged. (c)Worn or defective directional valve. (d)Worn or damaged pump. (e)Worn or defective hydraulic couplers.

ACCESSORIES

Auxiliary Switch and Control Cord, 113056 -An auxiliary switch is available for use when checking and adjusting pressures, and troubleshooting.

"T" gage T-124833 .A "T" gage is available for use when checking and adjusting pressures, and troubleshooting.

Hose and Control Cord Kits .Hose and control cord kits are available as shown in TABLE 2.

TABLE 2
Hose and Control Cord Kits

*Use in severe conditions and in welding environment.

Length in feet	Huck Part Number
12	118309-12
26	118309-26, 111955*
38	118309-38
52	118309-52. 112176*

Tooling Warranty: Huck warrants that tooling and other items (excluding fasteners, and hereinafter referred as "other items") manufactured by Huck shall be free from defects in workmanship and materials for a period of ninety (90) days from the date of original purchase.

Warranty on "non standard or custom manufactured products": With regard to non-standard products or custom manufactured products to customer's specifications, Huck warrants for a period of ninety (90) days from the date of purchase that such products shall meet Buyer's specifications, be free of defects in workmanship and materials. Such warranty shall not be effective with respect to non-standard or custom products manufactured using buyer-supplied molds, material, tooling and fixtures that are not in good condition or repair and suitable for their intended purpose.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. HUCK MAKES NO OTHER WARRANTIES AND EXPRESSLY DISCLAIMS ANY OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES AS TO MERCHANTABILITY OR AS TO THE FITNESS OF THE TOOLING, OTHER ITEMS, NONSTANDARD OR CUSTOM MANUFACTURED PRODUCTS FOR ANY PARTICULAR PURPOSE AND HUCK SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECTLY OR INDIRECTLY, ARISING FROM THE USE OF SUCH TOOLING, OTHER ITEMS, NONSTANDARD OR CUSTOM MANUFACTURED PRODUCTS OR BREACH OF WARRANTY OR FOR ANY CLAIM FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Huck's sole liability and Buyer's exclusive remedy for any breach of warranty shall be limited, at Huck's option, to replacement or repair, at FOB Huck's plant, of Huck manufactured tooling, other items, nonstandard or custom products found to be defective

in specifications, workmanship and materials not otherwise the direct or indirect cause of Buyer supplied molds, material, tooling or fixtures. Buyer shall give Huck written notice of claims for defects within the ninety (90) day warranty period for tooling, other items, nonstandard or custom products described above and Huck shall inspect products for which such claim is made.

Tooling, Part(s) and Other Items not manufactured by Huck.

HUCK MAKES NO WARRANTY WITH RESPECT TO THE TOOLING, PART(S) OR OTHER ITEMS MANUFACTURED BY THIRD PARTIES. HUCK EXPRESSLY DISCLAIMS ANY WARRANTY EXPRESSED OR IMPLIED, AS TO THE CONDITION, DESIGN, OPERATION, MERCHANTABILITY OR FITNESS FOR USE OF ANY TOOL, PART(S), OR OTHER ITEMS THEREOF NOT MANUFACTURED BY HUCK. HUCK SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECTLY OR INDIRECTLY, ARISING FROM THE USE OF SUCH TOOLING, PART(S) OR OTHER ITEMS OR BREACH OF WARRANTY OR FOR ANY CLAIM FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

The only warranties made with respect to such tool, part(s) or other items thereof are those made by the manufacturer thereof and Huck agrees to cooperate with Buyer in enforcing such warranties when such action is necessary.

Huck shall not be liable for any loss or damage resulting from delays or nonfulfillment of orders owing to strikes, fires, accidents, transportation companies or for any reason or reasons beyond the control of the Huck or its suppliers.

Huck Installation Equipment

Huck International, Inc. reserves the right to make changes in specifications and design and to discontinue models without notice.

Huck Installation Equipment should be serviced by trained service technicians only.

Always give the Serial Number of the equipment when corresponding or ordering service parts. Complete repair facilities are maintained by Huck International, Inc. Please contact one of the offices listed below.

Eastern

One Corporate Drive Kingston, New York 12401-0250

Telephone (845) 331-7300 FAX (845) 334-7333

Canada

6150 Kennedy Road Unit 10, Mississauga, Ontario,
L5T2J4, Canada.

Telephone (905) 564-4825 FAX (905) 564-1963

Outside USA and Canada

Contact your nearest Huck International Office, see back cover.

In addition to the above repair facilities, there are Authorized Tool Service Centers (ATSC's) located throughout the United States. These service centers offer repair services, spare parts, Service Parts Kits, Service Tools Kits and Nose Assemblies. Please contact your Huck Representative or the nearest Huck office listed on the back cover for the ATSC in your area.

LIMITED WARRANTIES

A Global Organization

Alcoa Fastening Systems (AFS) maintains company offices throughout the United States and Canada, with subsidiary offices in many other countries. Authorized AFS distributors are also located in many of the world's industrial and Aerospace centers, where they provide a ready source of AFS fasteners, installation tools, tool parts, and application assistance.

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For The Long Haul, The Future of Fastening Technology, The Future of Assembly Technology, The Future of Tooling Technology, and Tools of Productivity are service marks of Hock International. Huck provides technical assistance regarding the use and application of Huck fasteners and tooling.

NOTICE: The information contained in this publication is only for general guidance with regard to properties of the products shown

and/or the means for selecting such products, and is not intended to create any warranty, express, implied, or statutory; all warranties are contained only in Hock's written quotations, acknowledgements, and/or purchase orders. It is recommended that the user secure specific, up-to-date data and information regarding each application and/or use of such products.

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ALCOA

One Great Connection^{5M}



Section 1. Identification

Product name Hyspin HVI 46
SDS no. 460902
Code 460902-VN02

Relevant identified uses of the substance or mixture and uses advised against

Product use Hydraulic fluid.
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Supplier Castrol BP Petco
9th Floor – Times Square building
57-69F Dong Khoi Street
District 1, Ho Chi Minh City
Vietnam
Tel: 84-8-38219596 / 38219153
Fax: 84-8-38219603 / 38219152
Carechem: +65 3158 1074 (24/7)

EMERGENCY SPILL INFORMATION:

Section 2. Composition, information on ingredients

Substance/mixture Mixture
Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Ingredient name	CAS number	%
Distillates (petroleum), hydrotreated heavy paraffinic	64742-54-7	≥25 - ≤50
Distillates (petroleum), solvent-dewaxed heavy paraffinic	64742-65-0	≥25 - ≤50

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 3. Hazards identification

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.
Hazard statements No known significant effects or critical hazards.
Precautionary statements
Prevention Not applicable.
Response Not applicable.
Storage Not applicable.

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Section 3. Hazards identification

Disposal	Not applicable.
Routes of entry	Dermal contact. Eye contact. Inhalation.
Other hazards which do not result in classification	Defatting to the skin. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
Skin contact	Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.
Specific treatments	No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media	In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.
Unsuitable extinguishing media	Do not use water jet.

Specific hazards arising from the chemical

Hazardous thermal decomposition products	In a fire or if heated, a pressure increase will occur and the container may burst. Combustion products may include the following: carbon oxides (CO, CO ₂) (carbon monoxide, carbon dioxide)
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Section 5. Firefighting measures

Special protective actions for fire-fighters	No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.
Special protective equipment for fire-fighters	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

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Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Distillates (petroleum), hydrotreated heavy paraffinic	Ministry of Health (Viet Nam). TWA: 5 mg/m ³ 8 hours. Issued/Revised: 10/2002 Form: Mist STEL: 10 mg/m ³ 15 minutes. Issued/Revised: 10/2002 Form: Mist
Distillates (petroleum), solvent-dewaxed heavy paraffinic	Ministry of Health (Viet Nam). TWA: 5 mg/m ³ 8 hours. Issued/Revised: 10/2002 Form: Mist STEL: 10 mg/m ³ 15 minutes. Issued/Revised: 10/2002 Form: Mist

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.

Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.

The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the

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Section 8. Exposure controls/personal protection

	working conditions.
Skin protection	Use of protective clothing is good industrial practice. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Colour	Yellow. [Light]
Odour	Slight
Odour threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: >180°C (>356°F) [Pensky-Martens.]
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower and upper explosive (flammable) limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Density	<1000 kg/m ³ (<1 g/cm ³) at 15°C
Relative density	Not available.
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 46 mm ² /s (46 cSt) at 40°C Kinematic: 8.1 mm ² /s (8.1 cSt) at 100°C

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Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Aspiration hazard

Not available.

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact

No known significant effects or critical hazards.

Inhalation

Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.

Skin contact

Defatting to the skin. May cause skin dryness and irritation.

Ingestion

No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

No specific data.

Inhalation

No specific data.

Skin contact

Adverse symptoms may include the following:
irritation
dryness
cracking

Ingestion

No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Long term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Potential chronic health effects

General

No known significant effects or critical hazards.

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Section 11. Toxicological information

Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Environmental effects This material is harmful to aquatic life.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{oc}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

Other adverse effects

No known significant effects or critical hazards.

Other ecological information

Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

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Section 14. Transport information

	IMDG	IATA
UN number	Not regulated.	Not regulated.
UN proper shipping name	-	-
Transport hazard class(es)	-	-
Packing group	-	-
Environmental hazards	No.	No.
Additional information	-	-

Special precautions for user Not available.

Transport in bulk according to Annex II of Marpol and the IBC Code Not available.

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

No known specific national and/or regional regulations applicable to this product (including its ingredients).

Toxic classification (TCVN 3164-79)

Not classified as hazardous.

International lists

Australia inventory (AICS)

All components are listed or exempted.

Canada inventory

All components are listed or exempted.

China inventory (IECSC)

All components are listed or exempted.

REACH Status

For the REACH status of this product please consult your company contact, as identified in Section 1.

Japan inventory (ENCS)

All components are listed or exempted.

Korea inventory (KECI)

All components are listed or exempted.

Philippines inventory (PICCS)

All components are listed or exempted.

Taiwan Chemical Substances Inventory (TCSI)

All components are listed or exempted.

United States inventory (TSCA 8b)

All components are active or exempted.

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Section 16. Other information

History

Date of issue/ Date of revision	06 October 2020
Date of previous issue	8/3/2018
Prepared by	Product Stewardship
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

✔ Indicates information that has changed from previously issued version.

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