# NCH20

# Nuclear Cylinder Handler Operator's Manual







# **A** WARNING

### **California Proposition 65 Warning**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. Wash hands after handling.

Other chemicals in this vehicle are also known to the State of California to cause cancer, birth defects, and other reproductive harm.

This operator's manual should be regarded as part of the machine. Suppliers of both new and second-hand machines are advised to retain documentary evidence that this manual was provided with the machine.



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# General

### Introduction

This manual is your guide to correct operation of the Grapple on the Nuclear Cylinder Handler. The Nuclear Cylinder Handler includes a Telehander, model XR2034-C manufactured by Xtreme Manufacturing, and a Grapple attachment, manufactured by Allied Systems Company. Consult the Operation and Safety Manual from Xtreme Manufacturing for important operation and safety information for the base telehandler unit. This manual has detailed instructions for the Grapple attachment.

Become familiar with it, understand it, and use it. Read all instructions carefully prior to operation. They will help you understand the unit, its capabilities, and its limitations.

As an operator, it is your responsibility to make certain that your Nuclear Cylinder Handler operates at maximum efficiency, with the greatest possible safety. It is also your responsibility to keep it in top operating condition through proper operating techniques and correct operator maintenance. Remember, safe and efficient operation is up to you - the operator.

If you require information not found in this manual, please contact:

Allied Systems Company 21433 SW Oregon Street Sherwood, OR 97140 USA Phone: (503) 625-2560

### **Intended Use Statement**

The Nuclear Cylinder Handler, model NCH20, is specifically designed to pick up, transport and stack empty, heeled, and partially filled 48-inch diameter uranium hexafluoride storage cylinders. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to the conditions of operation, service and repair as specified also constitute essential elements of the intended use.

The machine should be operated, serviced and repaired only by persons who are familiar with its particular characteristics and who understand the relevant safety procedures.

Accident prevention regulations, and all other generally recognized regulations on occupational safety, must be observed at all times.

Any arbitrary modifications carried out on this machine may relieve the Allied Systems Company of any liability resulting from damage or injury.



Any removal of safety devices may result in damage to the machine, personal injury, or death.



Figure 1-1 The Wagner Nuclear Cylinder Handler, NCH20





### **Dimensions\***

### Specifications

А	
В	6' 9" [2,057 mm]
С	
D	1' 5" [432 mm]
Е	
F	
G	
Н	
J	
Κ	
L	

Max Rated Load Capacity	
Engine	Cummins 3.8L 120 HP (Tier 4F)
Transmission	
Axles	Dana 213
Tires	17.5 x 25 G2 - Solid
Fuel capacity	
Hydraulic oil capacity	
Hydraulic flow (per min)	
Hydraulic pressure	4,000 psi [275.7 bar]
Weight*	42,775 lbs [19,402 kg]

\* Approximate

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Figure 1-3 Load Chart

### Load Chart

The load chart is mounted in the cab, on the left side of the dash. See Figure 1-3. Note that the rated capacity of the NCH20 is 7,000 lbs (3,175 kg) in all grapple positions. INTENTIONALLY LEFT BLANK

# Safety

### Safety Is Your Business

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Why? Because SAFETY, based on knowledge, technical skill, and years of experience has been carefully built into your Nuclear Cylinder Handler. Time, money and effort have been invested in making your machine a safe product. The dividend from this investment is YOUR PERSONAL SAFETY.

However, it must be realized that no power-driven equipment can be any safer than the person behind the controls. If you don't operate and maintain your Nuclear Cylinder Handler safely, our efforts will have been in vain.

The safety instructions and warnings, as documented in this manual and shipped with the machine, provide the most reliable procedures for the safe operation and maintenance of your Nuclear Cylinder Handler. It's your responsibility to see that they are carried out.

The following pages contain general safety warnings which supplement specific warnings and cautions appearing elsewhere in this manual. All electrical and hydraulic equipment is potentially hazardous. You must thoroughly review and understand this Safety Section before attempting to operate, troubleshoot, maintain or service this Nuclear Cylinder Handler.

Allied Systems Company cannot anticipate all worksite conditions, local regulations, etc. It is the responsibility of the end user to be aware of and obey any specific worksite, local, state, or national regulations or procedures that are applicable to operating this equipment.

NOTE: All possible safety hazards cannot be anticipated so as to be included in this manual. Therefore, you must always be alert to potential hazards that could endanger personnel and/or damage the equipment.

### Safety Symbols

The following symbols/terms define the various hazard identifications and notices in this manual:



The "DANGER" symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.

# **A WARNING**

The "WARNING" symbol indicates a hazardous situation which, if not avoided, could result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.

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The "CAUTION" symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, or equipment damage. Carefully read the message that follows to prevent minor or moderate injury.

# NOTICE

The "NOTICE" symbol alerts to a situation that is not related to personal injury but may cause equipment damage.

The term "**NOTE**" highlights operating procedures or practices that may improve equipment reliability and/or personnel performance, or to emphasize a concept.



Obey the following cautions and warnings before using your machine to avoid equipment damage, personal injury or death.

### **Safety Regulations**

- Each country has its own safety legislation. It is in the operator's own interest to be conversant with these regulations and to comply with them in full. This also applies to local bylaws and regulations in force on a particular work site.
- Should the recommendations in this manual deviate from those in the user's country, the national regulations should be followed.

### **Operation Warnings**

- You must be trained in the operation of this machine prior to operation. Read this entire manual before operating this machine.
- Be extremely careful if you do not normally operate this machine. Reorient yourself to the machine before starting, then proceed slowly. However, you must not operate without having previously received proper training.
- Know your company's safety rules. Some have site specific directions and procedures. The methods outlined in this manual provide a basis for safe operation of the machine. Because of special conditions, your company's material handling procedures may be somewhat different from those shown in this manual.
- The only person required on the machine is the operator. Never allow anyone to ride on the machine anywhere outside the cab.

- Do not operate this machine if you know of malfunctions, missing parts, and/or mis-adjustments. These situations can cause or contribute to an accident or damage to the machine. Stop the machine immediately if problems arise after starting.
- All electrical cables and connectors must be in good condition. Use caution in wet weather to avoid danger from electrical shock.



• Do not start the engine if the key has been

marked with a "**DO NOT START**" or "**RED**" tag, or by your local "lockout/tagout" procedure.

- Never operate any of the cab controls from anywhere other than the operator's seat.
- Sound the horn to alert personnel in the area before starting the engine, and make sure every-

one is clear. Be sure that all controls are in neutral before starting the engine.

- Operate at low speeds in crowded areas or soft terrain.
- Avoid abrupt changes in boom direction.
- This machine is not designed for lifting or moving of persons. The operator's cab is the only safe location for personnel while the machine is in operation.

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- Operators must remain in their seats with the safety belt fastened during operation.
- Never pass a load over ground personnel or other equipment. Sound the horn and wait for the area to be cleared before moving the machine or load.
- Be accurate in load placement. It's important to know what the load will do when it's released.
- Lower or move the load to the ground before leaving the cab or shutting down the engine.
- High voltage electricity can discharge to ground without direct contact with the machine's structure. Minimum clearances from energized power lines or other power sources



must be maintained. If electrical energy does discharge through the machine, **REMAIN IN THE CAB**. Avoid contact with metal surfaces. Do not permit anyone to come into contact with the machine's structure.

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Remain at least 25 feet from high voltage electrical wires. Failure to do so may result in injury or death and will damage equipment.

### **Hydraulic Hazards**

Be aware of the hazards of pressurized hydraulics:

- Wear personal protective equipment, such as gloves and safety glasses, whenever servicing or checking a hydraulic system.
- Assume that all hydraulic hoses and components are pressurized.



Relieve all hydraulic pressure before disconnecting any hydraulic line.

- Never try to stop or check for a hydraulic leak with any part of your body; use a piece of cardboard to check for hydraulic leaks.
- Small hydraulic hose leaks are extremely dangerous, and can inject hydraulic oil under the skin, even through gloves.
- Infection and gangrene are possible when hydraulic oil penetrates the skin. See a doctor immediately to prevent loss of limb or death.

### **Maintenance Warnings**

Maintenance, lubrication and repair of this machine can be dangerous unless performed properly. Each person must satisfy himself that he has the necessary skills and information, proper tools and equipment, and that his work method is safe, correct, and meets his own company's requirements.

- Do not attempt to make adjustments, or perform maintenance or service unless you are authorized and qualified to do so.
- Unless specified in service procedures, never attempt maintenance or lubrication procedures while the machine is moving or the engine is running.
- Keep hands, feet, long hair and clothing away from power-driven parts. Do not wear loose fitting clothing or jewelry while performing maintenance and lubrication in these areas.



• All maintenance should be performed with the machine in the **Service Position** (machine parked on level surface, park brake engaged, boom retracted and lowered.



### Nuclear Cylinder Handler shown parked in Service Position

Before performing maintenance or service under the machine:

- Move the machine to a level surface, engage the parking brake, retract and lower the boom, and stop the engine.
- Wait 2 minutes, then disconnect the batteries at the disconnect switch at the rear of the machine, and employ lockout/tagout procedures.
- Block the tires to keep the machine from rolling.

### NOTE: Local laws and regulations may require that additional safety measures be taken. Please consult local authorities.

- Never rely on the hydraulic system to support any part of the machine during maintenance or lubrication. Never stand under a component that is supported only by the hydraulics. Make sure it is resting on its mechanical stops. If necessary, support components with appropriate safety stands.
- Use caution when working around hot fluids. Always allow lubricating and hydraulic oils to cool before draining. Burns can be severe.
- Use extreme caution when

using compressed air to blow parts dry. The pressure should not exceed 30 psi (208 kPa) at the nozzle. Never use air to blow yourself off. Air pressure penetrating your skin can be fatal.

- Engine exhaust fumes can cause death. If it is necessary to run the engine in an enclosed space, remove the exhaust fumes from the area with an exhaust pipe extension. Use ventilation fans and open shop doors to provide adequate ventilation.
  - DO NOT remove the radiator cap when the engine is hot. The coolant will be under pressure and can flash to steam with explosive force, causing severe burns. To prevent burns, remove the radiator cap only when the engine is cool.
- Before disconnecting hydraulic lines, be sure to lower all loads and relieve all hydraulic pressure.
  The load could fall on you, or escaping hydraulic oil could cause severe personal injury.
- Batteries contain sulfuric acid which can cause severe burns. Avoid contact with skin, eyes or clothing.
- Batteries produce explosive gases. Keep sparks, flame and cigarettes away. Ventilate when charging or servicing in an enclosed space. Always shield your eyes when working near batteries. When removing battery cables, always turn the battery disconnect switch(es) OFF first, then disconnect the negative (-) cable. When in-

stalling a battery, always connect the positive (+) cable first. This procedure will help to prevent a spark which could cause an explosion.

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- Before making adjustments to the engine or chassis electrical system, disconnect the battery. An electrical spark could cause a fire, explosion or severe burns.
- Before welding anywhere on the unit, disconnect the batteries and any other sensitive electronic equipment.
- It is essential to personnel safety that safe ladders, personnel lifts and/or scaffolding be used while servicing this machine.

### Safety Equipment

- Ensure test equipment is in good condition.
- If an instrument must be held while taking measurements, ground the case of the instrument before energizing equipment.
- Do not touch live equipment or personnel working on live equipment while holding a multimeter. Some types of measuring devices should not be grounded; do not hold such devices while taking measurements.
- Prevent personal injury or equipment damage by using a lifting device with a lifting capacity greater than twice the weight of any equipment to be lifted.
- Always use personal protective equipment (PPE) appropriate to the situation. This may include the use of hearing protection, eye protection, a respirator, a hard hat, leather gloves, steel toed boots, etc.



### **Electrical Hazards**

- An electric shock could be fatal. Ensure power to the Nuclear Cylinder Handler is "OFF" before opening electrical panels.
- All electrical cables and connectors must be in good condition (free of corrosion, damage, etc). Use caution in wet weather to avoid danger from electrical shock. Never attempt electrical testing or repair while standing in water.
- Do not wear electrically conductive jewelry, clothing, or other items while working on the electrical system.

### **Fire Safety**

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Diesel fuel and hydraulic oil are flammable. Never smoke while handling fuel or working on the fuel system. The fumes in an empty fuel container are explosive. Never cut or weld on fuel lines, tanks, or containers. Keep open flames and sparks away from the machine.

### **Avoiding Fire and Explosion Hazards**

 Keep the machine free of oil, grease, chips, and trash accumulations.
 Regular pressure washing and/or steam cleaning is recommended for fire prevention and general safety. Use an



approved solvent to clean machine parts. Never use gasoline or diesel fuel.

- Remove any debris from the operator's compartment after each work shift.
- Inspect the driveshaft and brakes for debris and remove as necessary.

- Never overfill the fuel or hydraulic tanks. Any overflow could cause a fire. Immediately repair any hydraulic or fuel leaks and clean up any spills.
- Shut off the engine and electrical equipment while filling the fuel tank. Use extra caution when fueling a hot engine. Always ground the fuel nozzle against the filler neck to avoid sparks.
- Handle all solvents and dry chemicals according to procedures identified on manufacturer's containers. Work in a well-ventilated area. Make sure you know where fire extinguishers are kept and how to use them.
- Avoid spilling fuel. If a spill occurs, wipe it up immediately.
- Always ensure that excess grease and oil accumulation, including spillage, is cleaned up immediately.
- Inspect the machine daily for potential fire hazards and make any necessary repairs immediately.
- Maintain the engine cooling system to avoid overheating.
- Check all the electrical wiring and connections for defects, and repair or replace as necessary. Keep battery terminals clean and tight.
- Never perform welding operations until the entire machine has undergone a thorough cleaning. In addition, cover rubber hoses and have a fire extinguisher at hand.
- Hydraulic fluid is flammable. Do not weld on or near pipes, tubes, or hoses that are filled with fluid.
- Store flammable starting aids in a cool, well ventilated location.
- Remember, there is always a risk of fire.

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### **Fire Fighting Equipment**

All Wagner units built after November 1, 2004 are supplied with a hand held fire extinguisher. If your unit is not so equipped, Allied Systems Company recommends that an appropriately rated fire extinguisher be installed. A 5 pound ABC rated extinguisher is the minimum size recommended. Install it within easy reach of the operator in a position that protects it from damage. Use only a "quick release" type of mount.

- Keep your fire extinguisher(s) and fire suppression system, if so equipped, fully charged and in good working order. Know how to use them. Allied Systems recommends that you, upon receiving your machine, contact your local authorized service center for your fire suppression system. Have your systems fully checked and verified before putting your machine into service.
- Read and understand the instructions printed on the canister and learn how to operate them. Learn how to remove the canisters from their mounting brackets in the shortest amount of time.
- Service the extinguisher and the fire suppression system according to the manufacturer's specifications. Service after every use, no matter how short a time, and never operate the machine without both in proper working order.
- Fire prevention features provided by the manufacturers should be maintained in operational condition and should be used to supplement the operator's fire prevention efforts. In no case should the features be used or assumed as replacement for diligent operator efforts at preventing fires.

### **Fire Suppression**

- Do not panic!
- Stop the machine and turn off the engine in the clearest area available.
- Lower the boom.
- If your machine is equipped with a fire suppression system, and that system has not automatically been activated, manually activate the system.

# \land WARNING

The hand held extinguisher is intended to be used to help prevent reflash only. Always exit the machine before using, and position yourself with an exit at your back for means of escape in case the extinguisher malfunctions or something unexpected happens

- Take the extinguisher and proceed to the source of the fire calmly.
- Though the manufacturer's instructions may vary, normally aim at the base of the fire.
- Even when the fire seems to be out, stand by with the extinguisher until the fire area is dead cool. Check this by removing any panels and looking for hot spots.
- Locate the cause of the fire and correct it before restarting the machine.
- Have your local authorized service center for your fire suppression system thoroughly inspect the entire machine and service or replace the extinguishers and fire suppression system before returning to work.

### **Machine Modifications**

- Any alterations to the machine that have not been approved by Allied Systems Company, or use of any non-OEM replacement parts, will void the warranty, and may introduce serious safety hazards.
- Any non-OEM parts used, or any alterations made are done so at your own risk to personnel safety. This includes the addition of accessories and attachments not manufactured or approved by Allied Systems Company.

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# Operation

### **Joystick Control**

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All of the boom and grapple positioning is accomplished with the console mounted joystick. See Figure 3-1.

NOTE: Boom and grapple functions are only available when the transmission is in "Neutral" (see the Xtreme Operator's Manual). Hydraulic functions are unavailable whenever the machine is in forward or reverse (unless overridden).

**Main Joystick X-Axis**: The joystick may be pushed left to retract the boom, or right to extend the boom.

**Main Joystick Y-Axis**: The joystick may be pushed forward to lower the boom, or pulled back to raise the boom.

**Left Slider**: The left slider may be slide up to tilt the grapple head down, or slide down to tilt the grapple head up. These functions may be reversed. Refer to Section 3 for details.

**Right Slider**: The right slider may be slide up to raise the grapple tines (open), or slide down to lower the grapple tines (close). These functions may be reversed. Refer to Section 3 for details.

**Push Buttons**: The left lower button may be depressed to rotate the grapple head left. The right lower button may be depressed to rotate the grapple head right. These functions may be reversed. Refer to Section 3 for details.



Figure 3-1 Joystick

### Boom Extend/Retract & Hoist Up/Down

The boom extend, retract, hoist up, and hoist down functions are controlled by moving the joystick. See Figure 3-1.

NOTE: The joystick is a variable speed control. Function speed is proportional to handle movement. The more the handle is moved in the appropriate direction, the faster the corresponding function will occur. Increasing the engine speed can increase boom hoist and extend speed. The joystick may be pushed left to retract the boom, or right to extend the boom. See Figure 3-2. The joystick may be pushed forward to lower the boom, or pulled back to raise the boom.

NOTE: These two functions may be engaged simultaneously by moving the joystick into a diagonal position between the two functions.



Figure 3-2 Boom Hoist and Extend Functions

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### **Grapple Rotate Left/Right**

The grapple may be rotated left or right by pressing the lower two buttons on the joystick. See Figure 3-1 and Figure 3-3. The buttons are not proportional.

The function ramps up to full speed over the span of 1.5 seconds when a button is depressed. The function

will stop nearly instantaneously when the button is released.

Rapid pressing and releasing of the buttons allows for precise positioning of the grapple head.



Figure 3-3 Grapple Rotate Left and Right

### Grapple Open/Close

The grapple may be opened or closed by operating the right slider on the joystick. See Figure 3-1. Opening the grapple raises the tines (retracted position), while closing the grapple lowers the tines (extended position). See Figure 3-4.

NOTE: The slider is a variable speed control. Function speed is proportional to slider movement. The more the slider is moved, the faster the function will occur. When the grapples reach the end of travel, one of the indicator lights on the home screen will turn green. Each of the four tines has two associated indicator lights, one for the raised position (retracted), one for the lowered position (extended).

The tines can only be lowered when both cylinder proximity sensors are in close proximity to the cylinder, or if that sensor has been overridden (see Section 3).



Figure 3-4 Grapple Open and Close (Retracted and Extended Positions)

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### Tilt Up/Down

The grapple may be tilted up or down by operating the left slider on the joystick. See Figure 3-1 and Figure 3-5.

NOTE: The slider is a variable speed control. Function speed is proportional to slider movement. The more the slider is moved, the faster the function will occur. The bottom of the grapple base head should remain parallel to the ground. As the boom is raised or lowered, the angle of the grapple base head should remain constant relative to the ground, though slight adjustments may be necessary using the tilt up/down slider to ensure that the grapple base head remains parallel to the ground.



Figure 3-5 Tilt Up and Down

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# Wagner Smart Screen





Press the home icon to access the Home Screen (see Figure 4-1). The home screen contains various indicators for the operator. See Figure 4-2 for key.

### **Proximity Sensor Indicators:**

- When a metal object is within the detection range of the proximity sensor, the corresponding indicator will turn green.
- When no metal object is within the detection range of the proximity sensor, the corresponding indicator will turn dark grey.
- If any of the indicators are dark grey with "OR" text, it means that sensor or function has been overridden (see page 4-5).
- There are two indicators for each of the four tines on the grapple. When the tines are fully raised, the four "RETRACTED" indicators should be illuminated green. When the tines are fully lowered, the four "EXTENDED" indicators should be green.
- There are two indicators that illuminate when the grapple is directly over and in contact with the cylinder. They will need to both be illuminated green before the grapple tines may be extended (lowered).

### Hydraulic Functions Enabled Indicator:

 The "HYDRAULIC FUNCTIONS ENABLED" indicator will illuminate green only when the transmission is set to "NEUTRAL" (see the Xtreme Operator's Manual). Hydraulic functions are unavailable whenever the machine is in forward or reverse (unless overridden).



Figure 4-1 Home Screen



Figure 4-2 Indicators Key

# Joystick Information Screen



Press the information screen icon to access the Joystick Information Screen. The Joystick Information Screen shows the operator the various joystick functions.

Main Joystick X-Axis: The joystick may be pushed left to retract the boom, or right to extend the boom.

Main Joystick Y-Axis: The joystick may be pushed forward to lower the boom, or pulled back to raise the boom.

Left Slider: The left slider may be slide up to tilt the grapple head down, or slide down to tilt the grapple head up. These functions may be reversed.

Right Slider: The right slider may be slide up to raise the grapple tines, or slide down to lower the grapple tines. These functions may be reversed.

Lower Buttons: The left lower button may be depressed to rotate the grapple head left. The right lower button may be depressed to rotate the grapple head right. These functions may be reversed.



Figure 4-3 Joystick Information Screen



Figure 4-4 Customer PIN Screen

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### Main Menu Screen



Press the menu icon to access the Main Menu Screen. The first time you attempt to access the Main Menu Screen, you will be prompted for a Customer PIN (See Figure 4-4). When prompted, enter "**0070**" as the customer PIN. This will grant access to the Main Menu and some of the sub-menu items. You will need to enter the customer PIN once per session. If the machine is powered down and back on, you will need to re-enter the Customer PIN.

From the main menu, you may select "CONTROLS" (see right), "SYSTEM MENU" (see page 4-4), or "OVERRIDES" (see page 4-5).

### **Controls Screen**

The Controls Screen allows the operator to control some of the hydraulic functions independently of the joystick controller.

TILT THUMBSTICK UP/DOWN: Use these buttons to tilt the grapple up or down.

GRAPPLE THUMBSTICK UP/DOWN: Use these buttons to retract (raise) the grapple tines, or extend (lower) the grapple tines.

ROTATE LEFT/RIGHT: Use these buttons to rotate the grapple left or right.

SCREEN CONTROL SPEED: Use this slider to set the hydraulic speed. 100 for full speed, 0 for no speed. It is set at 50 (half speed) by default.

CONTROLS SETTING: Press this button for additional controls settings, and is available only to the factory.



Figure 4-5 Main Menu Screen

Figure 4-6 Controls Screen

### System Menu

The System Menu page is a built-in menu that accesses various parameters. All relevant adjustments should be made outside of this menu system.



Figure 4-7 System Menu

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### **Overrides Screen**

The Overrides Screen allows the operator to override various functions.

# **WARNING**

Overrides should only be used in extreme situations or for troubleshooting. There should never be any overrides active during normal use.

Whenever a function is overridden, the icon on the home screen will be grey, with "OR" in red:

**FWD/REV HYD BLOCKING**: When this override is active, the operator will be able to actuate the hydraulic functions even if the machine is not in Neutral.

**PROX SENSOR OVERRIDES**: Selecting any of the prox sensor overrides will send a false signal that the proximity sensor has been engaged.

For the extension and retraction proximity sensors, this will have no effect on operation other than to show that the sensor input has been overriden on the home screen.

For the right and left cylinder proximity sensors, this will allow the tines to be extended (lowered) even if the proximity sensors are not registering contact with the cylinder.



Figure 4-8 Overrides Screen

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# Maintenance

### Lubrication, Grapple

Proper and consistent lubrication of articulation points on your Nuclear Cylinder Handler is vital to the longevity of your machine.

Refer to the Xtreme Manual for lubrication intervals and procedures for the telehandler.

The grapple assembly has 34 grease fitting locations. The grapple assembly should be lubricated after every 50 hours of operation. See Figure 5-1 and Table 5-1.

Use Mobilgrease Special No. 2, and apply two pumps of grease at each grease fitting.



Figure 5-1 Lubrication Points

Point	Description	Number of Locations	Grease	Interval
1	Tine Pins, 2 Per Pin (Both Sides) 8 Pins Total	16		
2	Cylinder Pins, 2 Per Cylinder (Base End and Stem End) 4 Cylinders Total	8	Mobilgrease	Every 50 Hours
3	Trunnion Tube, Lower	3		
4	Trunnion Tube, Upper	3		
5	Slew Drive Assembly, 2 on Outside, 2 on Inner Race of Bearing (Not Shown)	4		

### Table 5-1 Lubrication Points

### **Proximity Sensor Testing**

Prior to each shift, each of the 12 proximity sensors should be tested for functionality.

With the keyswitch turned on, hold a piece of steel next to each of the 12 proximity sensors. Each sensor has a light on the sensor. The light should be illuminated when there is no metal detected, and should turn off when metal is detected.



Figure 5-2 Lower Proximity Switch Locations



Figure 5-3 Upper Proximity Switch Locations

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# **Fire Suppression System**





Figure 6-1 Checkfire 110 Display Module

### Fire Suppression System

Your Fire Suppression System includes an automatic detection system and the CHECKFIRE 110 display module mounted in the upper right corner of the cab (see Figure 6-1). A manual actuator is mounted on the right side of the chassis, at ground level, just below the LVS tank. (See Figure 6-2).

The red button "PUSH TO ACTIVATE" on the CHECK-FIRE 110 display module will set off the system.

IMPORTANT! The system may be actuated by either the operator, by ground personnel, or by the automatic fire detection system.

The operator may activate the system by pressing the red button on the CHECKFIRE 110 display module in the upper right corner of the cab (see Figure 6-1).

Ground personnel may active the fire suppression system by pulling the pin and striking the button on the ground level actuator mounted on the right side of the chassis, at ground level, just below the LVS tank (See Figure 6-2).

If activated by either the operator or by ground personnel, the system will discharge immediately. If activated by the automatic fire detection system, there will be a delay of 15 seconds before system discharge, with the option to delay the discharge. This is to allow the operator to move the machine to level ground and lower the grapple. See next page for details.



Figure 6-2 LVS Tank & Ground Level Actuator

### In Case Of Fire

- Whenever a fire is detected by the operator, ground personnel, or by the automatic fire detection system, the operator should immediately move the machine to level ground, lower the grapple, and set the parking brake. Once the suppression system is actuated, there will be no power to move the machine, or to actuate the service brakes.
- 2. When the system is initiated by the automatic fire detection system, an alarm will sound for 15 seconds before the system discharges. You may reset the 15 second interval by momentarily pressing the "Delay Release" button on the CHECKFIRE 110 Display module (see Figure 6-1). The release may be delayed several times if necessary to give you enough time to move the machine to a safe area. Once the system discharges, it cannot be stopped.

# NOTICE

Pressing and holding the "Delay Release" button will not pause the time delay.

- 3. If manually initiated, the system will discharge immediately.
- 4. To manually initiate the system, swing the guard door open, press the red "Push to Activate" button on the CHECKFIRE 110 Display module (see Figure 6-1) and then LEAVE THE VEHICLE. Fire retardant will be released, the engine will shut down, and the batteries will be disconnected from the electrical system.

- 5. Call the Fire Department and/or service personnel as soon as possible. After the system has discharged, watch carefully for flare ups and spot fires while maintaining a safe distance.
- 6. Stay clear of the vehicle until it has cooled completely.

# \land WARNING

After a fire, hydraulic and coolant hoses are an extreme hazard. Stay away from the machine until it has cooled completely.

The hoses containing these very hot, pressurized fluids may have been damaged by the fire and could burst at any time, causing serious burns or death.

7. Any time the system is discharged, it must be refilled and recharged before resuming operation. Only Ansul representatives are authorized to refill/ recharge the fire suppression system.

# 

All maintenance and servicing should be performed by a qualified service technician from your local authorized service center for your fire suppression system.

See form 80-1451 in your manual pack for more details on the CHECKFIRE 110 system.



# **Schematics**

# **Schematics Table of Contents**

ITEM	ASC P/N	DESCRIPTION	PAGE
	NCH20-103	Nuclear Cylinder Handler	
1	605998	. ANSI Schematic, Electrical	7-3
2	605999	. ANSI Schematic, Hydraulic	7-5

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IQAN XC43



PUR = 5V REF

BLUE = -VREF

Figure 7-1 605998 ANSI Schematic, Electrical

NOTE: PART NUMBERS LISTED IN THIS SCHEMATIC ARE FOR REFERENCE ONLY AND NOT CONTROLLED.



	LR RETRACT PROX SENSOR	
D	C21	۰ <b>،</b>

	LR EXT PROX SENSOR						
1		VDEE	C20		I I I		
	<u>в</u>	Vout SIGNAL		L ‡	<b>B</b>		
	~	POWER 12V					

				0
	LF RETRA	CT PRO	X SENSOR	
D	VDEE	C19		- • • • •
Б	-VREF Vout SIGNAL		ΙŧΙ	i de alí
<u></u>	POWED 42V		∏>—́—¢	
А	POWER IZV	1	<u> </u>	

		LF EXT	PROX SI	ENISOR	
	в	-VREE	C18		ва
	C	Vout SIGNAL		L.‡ _	09
_	Δ	POWER 12V			

B -VREF C Vout SIGNAL	BCA

		RR EXT	PROX S	ENSOR	
			C16		
-	В	-VREF		ļ	B
+	С	Vout SIGNAL		⊢,∓_,,	e e
-	Α	POWER 12V	-	4 5	

	C
	<u>.</u>
C Vout SIGNAL	8.
A POWER 12V	S
	C

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Figure 7-2 605999 ANSI Schematic, Hydraulic 80-1452 Rev: 02-2025 7-5 / (7-6 blank)





# **Parts Lists**

### **Procedure for Ordering Parts**

CONTACT ALLIED SYSTEMS FOR WAGNER PARTS AND SERVICE.

1. Name:		
2. Address:		
3. Shipping Instructions:		
4. Model:	Serial Number:	
5. Part Number:	_Quantity:	_Description:

ALWAYS GIVE MODEL AND SERIAL NUMBER - The Model and Serial numbers positively identify your unit, and any special features, options or accessories. In emergencies, it's very important to get the proper parts in the shortest possible time. To reduce costly downtime and to ensure correct parts shipment, ALWAYS GIVE THE MODEL AND SERIAL NUMBER.

# **Parts Table of Contents**

ITEM	ASC P/N	QTY	DESCRIPTION		
	NCH20-103		Nuclear Cylinder Handler		
1	605994	1	. Grapple Assembly		
	571858	4	Cylinder	8-9	
	94797	1	Slew Drive Assembly	8-11	
	606012	1	Double Cross Check Assembly	8-12	
2	605995	1	. Controls Installation	8-14	
	606231	1	Joystick	8-21	
3	605996	1	. Fire Suppression System	8-22	
	606354	1	Fire Suppression Display Module, CHECKFIRE 110-D	8-33	
4	606216	1	. Pressure Blocking Valve	8-36	
5	606412	1	. Fire Extinguisher Installation	8-39	
6	605997	1	. Decal Locations	8-41	
				1	

	Grapple Assembly 48" UF6							
Item		Part No.	Qty	Description	Item	Part No.	Qty	Description
		605994		Grapple Assembly 48" UF6				
1		606019	1	. Grapple Base	60	Y17C-1032	20	. Capscrew
2		606032	1	. Clevis	61	Y17C-1044	20	. Capscrew
3		571802	1	. Trunnion	62	230682W	1	. Capscrew
4		571803	2	. Grapple, Side	63	221763W	6	. Washer
5		606036	4	. Tine	64	R13802914	4	. Washer
6		571856	1	. Pin	65	221767W	2	. Washer
7		571857	1	. Pin	66	221771W	4	. Washer
8	*	571858	4	. Cylinder	67	234271	40	. Washer
9	*	94797	1	. Assembly, Slew Drive	68	15113W	3	. Locknut
10		606047	1	. Diverter Valve, 6 Way	69	R13811190	2	. Locknut
		261621	1	Coil	70	237567	8	. Locknut
		261622	1	O-Ring	71	223587	4	. Locknut
		261623	1	Nut	72	R13811196	1	. Locknut
11		606229	1	. Plate, Diverter Valve Mount	73	231537	10	. Clamp
21		526967	4	. Bushing	74	231441	3	. Fitting
28		571173	8	. Pin	75	231452	1	. Fitting
29		58954W	16	. Snap Ring	76	R833204	4	. Fitting
30		571180	16	. Bushing	77	R834700	6	. Fitting
31		606257	4	. Pin	78	R833112	4	. Fitting
32		571222	4	. Pin	81	00271283	4	. Fitting
33		237732	24	. Setscrew	82	606256	16	. Bearing, Thrust Washer
37		00191758	18	. Fitting, Lube	83	231838	8	. Fitting
41		571931	2	. Pin	99	606044	1	. Kit Hose
42		502744	4	. Lock Collar	99.1	602185	4	Hose Assembly
45		217419	8	. Washer	99.2	605489	4	Hose Assembly
49	*	606012	1	. Double Cross Check Assembly	99.3	606045	2	Hose Assembly
51		606043	1	. Plate, Slew Spacer	99.4	R12211	3	Hose Assembly
52		234867	3	. Capscrew	99.5	601349	1	Hose Assembly
55		R13801798	2	. Capscrew	99.6	235527	1	Hose Assembly
56		162572W	2	. Capscrew	99.7	598143	1	Hose Assembly
57		R13811040	8	. Capscrew	99.8	233846	1	Hose Assembly
58		R13811077	2	. Capscrew	99.9	594039	1	Hose Assembly
59		R13811086	2	. Capscrew	99.10	606072	2	Hose Assembly

### Crapple Accomply 10" LIEG

\* See Separate Coverage

Table 8-1 Grapple Assembly Parts List

# Wagner

Allied Systems



Grapple Assembly 48" UF6

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### Grapple Assembly 48" UF6







Figure 8-1. Grapple Assembly (sheet 2 of 3) 80-1452 Rev: 02-2025 8-5 / (8-6 blank)

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Grapple Assembly 48" UF6



Cylinder, Grapple



TORQUE NUTS TO 45 FT-LBS (WET) AFTER ATTACHING ITEM 2

Part No.	Qty	Description
571858		Cylinder, Grapple
237993	1	. Cylinder, Hydraulic
261740	1	Kit, Hod Cartridge Soal Kit, Biston & Tubo
571865	1	. Base. Cvlinder
571179	1	. Eye, Cylinder
00219753	1	. Jam Nut
571224	2	. Bushing
00191758	2	. Fitting, Lube

Item

1

6

Figure 8-2. Cylinder 80-1452 Rev: 02-2025 8-9 / (8-10 blank)



**Slew Drive Assembly** 





NOTES:

REMOVE PRE-EXISTING GREASE-ZERKS AND REPLACE WITH SS GREASE-ZERKS

NOTE:
USE METAL-FREE
ANTI ~ SEIZE
DEPAC ~ 505
ON ALL HARDWARE
(ASC # 244265)
· · · ·

Item	Part No.	Qty	Description
	94797		Slew Drive Assembly
1	94798	1	. Drive, Slew
2	94799	1	. Motor, Slew Drive
3	233573	2	. Capscrew
4	10643	4	. Fitting, Lube



Figure 8-3. Slew Drive Assembly

Double Cross Check Assembly



Item	Part No.	Qty	Description
	606012		Double Cross Check Assembly
1	77577	1	. Valve Body
2	244422	2	. Cartridge, Valve
	242101	1	Seal Kit

Allied Systems

Figure 8-4. Double Cross Check Assembly



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	Controls Installation						
Item	Part No.	Qty	Description	Item	Part No.	Qty	Description
	605995		Controls Installation				
1	606352	1	. Smart Screen	28	221763W	66	. Washer
2	602111	2	. Module, Expansion	31	15113W	34	. Locknut
3	606037	12	Proximity Sensor, Inductive	33	595326	30	. Mount, Tack
5	221801	1	. Switch	34	592776	1	. Plug Assembly
6	92999	1	. Busbar, 250A	35	592780	1	. Receptacle Assembly
7	* 606231	1	. Joystick	36	231251	4	. Clamp
8	606038	12	. M12 To Deutsch Adapter	37	238429	2	Clamp
9	605612	1	Mega Safety Fuse Block	38	2313417	1	. Fuse
10	606039	8	. Plate, Prox Sensor Mount	39	605731	1	. Fuse
11	606336	2	. Plate, Prox Sensor Mount	40	606182	1	. Wire Harness, Proximity
12	606337	2	. Plate, Prox Sensor Mount	41	606183	1	. Wire Harness, J1939
13	591879	1	. Bracket, Mounting	42	606184	1	. Wire Harness, Cab
14	602794	1	. Bracket, Monitor Mount	43	606340	1	. Wire Harness, Battery & Relay
16	606341	1	. Plate, Tap Pad	44	220326	1	. Cylinder, Air
18	606343	1	. Plate, XC43 Mount	45	Y25G-(1024)14	2	. Capscrew
19	249395	8	. Capscrew	46	209405	1	. Fitting
20	Y73G-(1024)12	6	. Capscrew	47	224191	2	. Nut, Esna
21	R13810989	4	Capscrew	48	R13801782	2	. Capscrew
22	R13810993	22	. Capscrew	49	606444	1	. Plate, Fire Suppression Mount
23	R13810996	6	. Capscrew	50	606445	1	. Plate, MD4 Mount
24	Y73G-0416	4	Capscrew	51	606446	1	. Plate, Fire Suppression Cylinder
25	Y73G-0424	4	. Capscrew	52	606468	1	. Threaded Adapter
27	Y35E-#10	16	Washer	53	292657W	1	. Nut
				54	606470	2	. Adapter Assembly
				55	606535	1	. Plate, Blanking

\* See Separate Coverage

Table 8-5. Controls Installation Parts List



# <u>Allied Systems</u>



### NOTES:

- 1 USE TACK MOUNTS ON EACH SIDE OF CONNECTORS.
- 2 ENSURE ADAPTERS HAVE DRIP LOOPS.
- 3 ALL PROX SENSORS MUST HAVE .125" TO .375" SPACING BETWEEN THE SENSOR AND MOVING PARTS.
- FIT UP PARTS ON THE MACHINE NEAR THE OEM BATTERY DISCONNECT SWITCH AND CHECK WIRE ROUTING AND PART CLEARANCE BEFORE WELDING TO CHASSIS.
- 5 MATCH DRILL HOLES IN BOLT-ON CAB PANEL NEAR FLOOR TO MOUNT ITEM 18. TEST LOCATION FOR BEST WIRE ROUTING.
- 6 USE EXISTING 4/14 CABLE IN HORSE HEAD AS CAN/PWR ADAPTER BETWEEN GRAPPLE AND CHASSIS HARNESSES.
- REMOVE AUX CONTROL HANDLE AND AUX CONTROL COVER FROM VALVE. REPLACE COVER WITH BLANKING PLATE. CHECK THAT AUX VALVE HARD STOPS ARE COMPLETELY DISENGAGED.
- 8 REMOVE DECALS FROM VALVE COVER AREA. DECALS TO REMOVE: 18347-00R01, 18033-100, 18334-001.

### **Controls Installation**

Figure 8-5. Controls Installation (sheet 1 of 3) 80-1452 Rev: 02-2025 8-15 / (8-16 blank)

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### **Controls Installation**

# wagner



SECTION 3F1-3F1

### **Controls Installation**



C28 TRANSMISSION FWD SIGNAL

Joystick



Item	Part No.	Qty	Description
	606231		Joystick
1	260579	2	. Kit, Proportional Slider
2	260583	2	. Kit, Push Button Switch
3	260578	1	. Kit, Handle Cases and Triggers



Figure 8-6. Joystick



	Fire Suppression System						
Item	Part No.	Qty	Description	Item	Part No.	Qty	Description
	605996		Fire Suppression System	61	221497W	10	. Capscrew
1	* 606354	1	. Display Module, Checkfire	62	595326	20	. Mount, Tack
2	590680	1	. Tank, LVS-5	63	249329	40	. Cable Tie
3	221961	1	. Cartridge, N2 Gas	64	R13811013	8	. Capscrew
4	594262	2	. Actuator	65	Y17C-0616	11	. Capscrew
5	225177	1	. Cartridge, Nitrogen	66	2311550	1	. Clip, Harness Mounting
7	606355	5	. Kit, Nozzle	67	R13803025	3	. Clip, Insulated
8	223041	1	. Bracket, Mounting	68	R13803022	7	. Clip, Insulated
9	218728	1	. Relief Valve	69	606188-0160	1	. Release/Power Cable, ANSUL
10	218690	1	. Bracket, Nozzle	70	606188-0200	1	. Release/Power Cable, ANSUL
11	598366	1	Bracket	71	606191-0170	1	. Detection Cable
12	253067	1	. Chemical, Fire Suppression	72	606197-2	1	. Cable, Linear Detector
13	249732	5	. Elbow, Pipe	74	228350	1	. Terminal, Ring
14	595376	2	Elbow, Pipe	75	244160	1	. Terminal, Ring
15	249733	4	. Tee, Pipe	76	594287	1	. Label Package, Fire System
16	209752	2	. Fitting	77	606356	1	. Plate, Fire Suppression Mount
17	22293	2	. Fitting	78	606357	4	. Plate, Nozzle Mount
18	209757	13	. Fitting	79	CLP0100200	1	. Clamp
19	209161	3	. Fitting	80	221280	1	Fitting
24	209406	1	. Fitting	81	590087	A/R	. Tape
25	596370	1	. Fitting	82	YHGB 06	4'	Hose Guard, Plastic Spiral
27	225250	12	. Lockwasher	83	247141	1	. Clamp
29	606126	2	. Cable, Drop	84	221763W	2	Washer
30	606124	1	. Cable, H Release	85	15113W	2	. Locknut
31	606175	1	. Connector DT, EOL Device	86	R13810998	2	. Capscrew
35	606125	1	. Cable, H Detection	99	606431	1	. Kit, Hose
36	606447	1	. Cable, Fused Power Circuit	99.1	2316590	1	Hose Assembly
37	221771W	12	. Washer	99.2	606457	1	Hose Assembly
38	R13802914	16	. Washer	99.3	243689	1	Hose Assembly
39	223587	6	. Locknut	99.4	2316596	1	Hose Assembly
40	R13811190	8	. Locknut	99.5	606456	1	Hose Assembly
42	200454W	6	. Capscrew	99.6	591888	1	Hose Assembly
44	209698	1	. Clamp	99.7	591105	1	Hose Assembly
45	606453	1	. Plate, Bulkhead Mount	99.8	587413	1	Hose Assembly
46	606454	1	. Plate, Bulkhead Mount	99.9	591469	1	Hose Assembly
47	209940	1	. Fitting	99.10	606458	1	Hose Assembly
51	606452	1	. Plate, Bulkhead Mount	99.11	242742-125	A/R	Spiral Wrap
54	606127	1	. Actuator				
55	594263	2	. Actuation Device, Protracting				
56	606451	1	. Bracket, Plate	*	a See Separate C	Coverag	e
57	539197	1	. Decal, Fire Extinguisher			-	
59	221767W	42	. Washer				
60	237567	21	. Locknut				





### LH VIEW

### NOTES:

- 2. ITEMS 81, 82 ARE NOT SHOWN:
- THE USE OF ITEM 81 IS TO BE USED ON ALL THREADED PIPE CONNECTIONS. DO NOT ALLOW TAPE INSIDE OF CONNECTION. THE USE OF LIQUID SEALANTS IS NOT APPROVED BY ANSUL.
- ITEM 82 IS TO BE USED WHEN PASSING HOSE THROUGH OR AROUND ANY SHARP EDGES OF A DECK OR BULKHEAD.

3. ANSUL RECOMMENDS THE FOLLOWING MINIMUM BEND RADII FOR PARKER 426 SERIES HOSES. #4 --- 4.00 IN, #8---7.00 IN, #12---9.50 IN. - ALL ANSUL CABLES HAVE A MINIMUM BEND RADII OF 2.5 INCHES.



> ITEM 76.1 & 76.2 ARE INCLUDED AS A KIT IN ITEM 76 (ASC P/N 594287). AFFIX LABEL AS SHOW TO RH WINDOW. FOR LABEL 76.2, CUT OUT 10 SECOND LABEL AND PLACE IN OPEN SPACE, SUCH THAT LABEL READS "AFTER 10 SECONDS".

5 WHEN FILLING TANK USE A FUNNEL AND LONG HOSE THAT REACHES BOTTOM OF TANK TO PREVENT SLOSHING OF LIQUID FOAM AGENT. THE CHEMICAL FOAM BUBBLES MAY TAKE DAYS TO DISSIPATE WHEN AGITATED.

6 DO NOT INSTALL ITEM 55 AS THIS WILL ARM FIRE SUPPRESSION SYSTEM. THE ADDITION OF POWER BY ITEM 36 (POWER CABLE) WILL ACTIVATE SYSTEM FOR NORMAL DUTY.

- ONCE POWER IS CONNECTED, SYSTEM WILL CHARGE BACK UP CAPACITOR, FOR A RESERVE CHARGE OF 72 HRS OF POWER.

7 ROUTE CABLE AS SHOWN, SUPPORT CABLE EVERY 16 INCHES WITH TACK MOUNTS AND CABLES TIES

- CABLE MINIMUM BEND RADIUS IS 2.5 INCHES FOLLOW MANUFACTURE INSTUCTION. SEE ASC DOCUMNET 80-902
- KEEP LINEAR DETECTOR CABLE 12 INCHES AWAY FROM TURBO AND EXHAUST
- ALL CABLES HAVE A MINIMUM BEND RADIUS OF 2.5 INCHES
- DO NOT PAINT ANY CABLES IN THIS ASSEMBLY

8 >HOOD WORKING LOOP CLAMP

- CLAMP HOOD HOSE TO CAB

- MOUNT CAP SCREW HEAD OUTSIDE OF CAB FOR CLEARANCE

**Fire Suppression System** 







ITEM 77 LOCATED ON OUTSIDE OF RH BOOM STRUCTURE

Fire Suppression System





Figure 8-7. Fire Suppression System (sheet 2 of 5) 80-1452 Rev: 02-2025 8-25 / (8-26 blank)





### Fire Suppression System

Figure 8-7. Fire Suppression System (sheet 3 of 5) 80-1452 Rev: 02-2025 8-27 / (8-28 blank)





CAB PASS THRU

# wagner



Fire Suppression System



72 HOUR INTERNAL POWER RESERVE MAX CURRENT: 50mA SUPPLY VOLTAGE: 10.2-28 VDC OPERATING TEMPERATURE: -40°F TO 140°F





Display Module, Checkfire 110-D

DETECTION

DUST CAP (TWO PLACES)



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Valve, Pressure Blocking								
Item	Part No.	Qty	Description	Item	Part No.	Qty	Description	_
	606216		Valve, Pressure Blocking					
1	261746	1	. Connection Block	10	261750	1	. Coil	
3	261747	1	. Orifice	11	261751	1	. Fixing Nut	
4	261748	1	. Indexing Ring	14	261752	1	. Plug, Single Solenoid	
5	261749	2	. Lock Washer Pair	100	261753	1	. Seal Kit	
6	252453	2	. Socket Head Screw					

Table 8-9. Pressure Blocking Valve Parts List



# <u>Allied Systems</u>

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PORT B #16 ORB

 $\bigcirc$ Ç, 0 MAC

### Valve, Pressure Blocking

note: Cartridge not available individually

- 3

Figure 8-9. Pressure Blocking Valve 80-1452 Rev: 02-2025 8-37 / (8-38 blank)



**Fire Extinguisher Installation** 



INSTALL NOTES:

- 1. SUGGESTED INSTALL LOCATION IS ON THE TOOL BOX ON THE FRONT OF THE CAB.
- 2. USE FIRE EXTINGUISHER MOUNT TO MATCH DRILL HOLES.

Item	Part No.	Qty	Description
	606412		Fire Extinguisher Installation
1	606459	1	. Fire Extinguisher w/Vehicle Mount
2	221763W	4	. Washer
3	15113W	4	. Locknut
4	R13810993	4	. Capscrew

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Figure 8-10. Fire Extinguisher Installation

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Figure 8-11. Decal Locations 80-1452 Rev: 02-2025 8-41 / (8-42 blank)

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21433 S.W. Oregon St Sherwood, OR 97140-9799 (503) 625-2560 (800) 285-7000 Fax: (503) 625-5132 www.alliedsystems.com

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Note: Specifications are subject to change without notice.