CAN RANGER

Radio/CAN Remote Control System

Installation Manual

3B1901HK | REV. DATE: December 13, 2022

TABLE OF CONTENTS

Note to installer: To ensure the safety of this system the ENGINE STOP must functions property. After installation and calibration, use transmitter to start the engine then move each valve lever on the crane individually away from the center to ensure that engine stops for each forward and reverse position. Next, press E-stop switch to ensure that engine stops running.

Installation video is available at:
http://youtu.be/eLeEO1vsB6E

CONTROL MODULE

1. Loosen the speed knobs on the load sensor module to accommodate the bracket and slide the control module on. Tighten the knobs securely (FIG. 1 & 2)

FIG. 1

FIG. 2

ACTUATOR ASSEMBLY

1. Remove the access panels both above and below the arm holding the load sensor and control module
2. Install or remove Drain plugs per instruction in Appendix A.
3. Mount the actuators to the bracket using the hardware provided
4. Mount the actuator assembly to the turret just above the valve bank using the two holes available and hardware provided (FIG. 3a)
5. Fabricate the linkages used to connect the actuators to the valve control arms from the provided hardware:

a. Screw valve rod end to each of the actuators as shown (FIG. 3b)
b. Attach clevis hardware to each valve rod end (FIG. 3c)
c. Attach clevis hardware to each control arm tab as above
d. Be sure each actuator is extended halfway out
e. Measure and cut the rod to span between clevis ends installed previously
f. Remove one clevis end from each actuator and install connecting rods and two jam nuts. Make sure the clevis end on both the actuator and the valve rod is lined up to prevent binding.
g. Use manual control handles and check for proper operation and no binding issues. Tighten up the jam nuts.
h. Dress cables as shown in FIG. 4
i. Remove drain plugs per decal instruction.

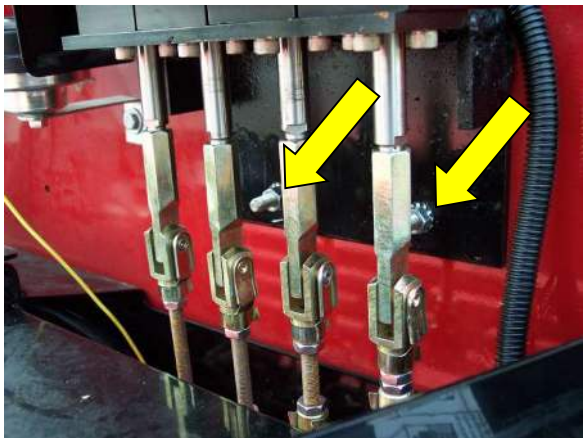


FIG. 3a

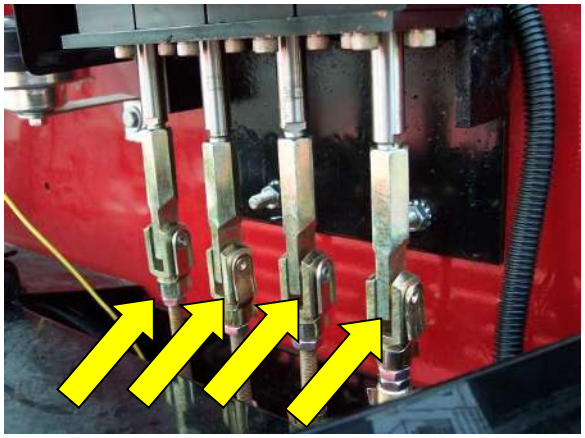


FIG. 3c

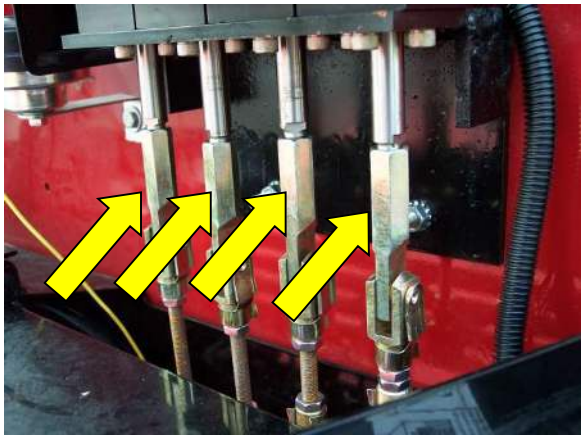


FIG. 3b

FIG. 4

LOCAL/REMOTE SWITCHES

1. Remove the switch hole cover on both sides of the operator console and mount a switch as shown by pressing until it is fully seated (FIG. 5)

FIG. 5

RPM RELAY MODULE

1. Remove the driver's side turret access panel
2. Mount the RPM relay module to the right inside wall of the turret on the driver's side as shown using the supplied hardware (FIG. 6)

FIG. 6

CABLES

NOTE: PLEASE REMOVE PIGTAIL PLUGS FROM REMOTE, BA, and BB CONNECTORS BEFORE PROCEEDING. THESE WILL NOT BE NEEDED IF MATTING CONNECTORS ARE SUPPLIED WITH CRANE HARNESS.

1. Beginning at the lower access panel, feed the main harness with the 6 and 12-position connectors first, behind the valve assembly, around the back of the actuator assembly, and up toward the arm (FIG. 8 & 9)
2. Plug the 6 and 12-position connectors into the control module (FIG. 11). Leave enough slack on the cable so that the arm can pivot freely
3. Pull up the cable with the connector marked CA and route it through the upper hole in the turret (FIG. 10)
4. Connect each of the actuator cables to one of the 4 jacks provided on the Y-cable from the receiver. Loop any extra cable and bundle these neatly, tying them to a convenient point (FIG. 4).

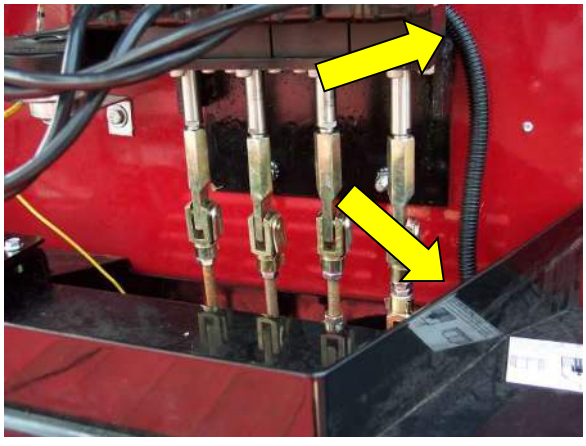


FIG. 8

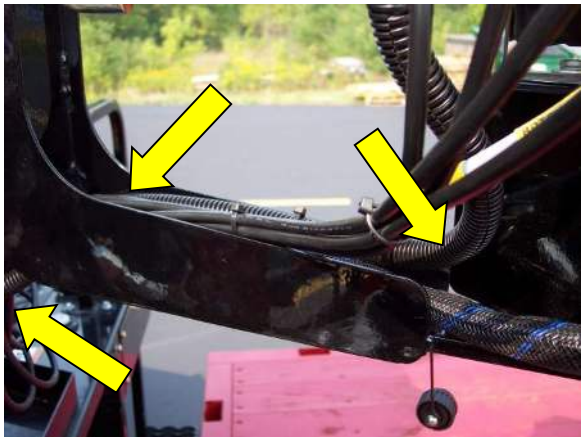


FIG. 9

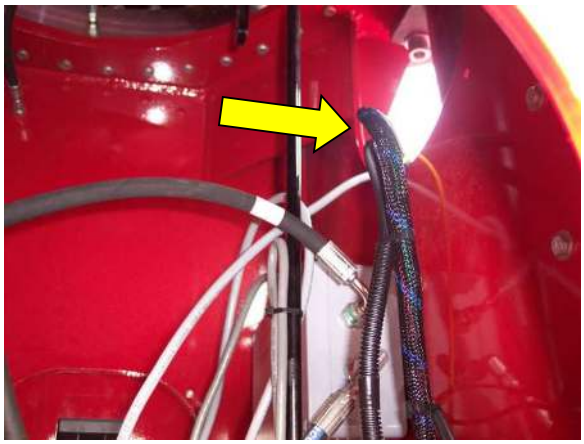


FIG. 10

FIG. 11

CABLES (continued)

5. Route the cable remaining left by the lower access cover with the connector marked REMOTE underneath the passenger side operator console
6. Find the connector available from the truck marked REMOTE CONTROL and plug the connector of the main harness marked REMOTE into it (FIG. 12)
7. While still underneath the passenger side console, plug the red wires exiting near the connector marked REMOTE (with spade terminals) of the main harness into the switch previously installed (FIG. 13) Connect to the two silver colored terminals that are close together
8. Route the remaining cable left by the lower access cover underneath the driver's side operator console, locate the LOCAL/REMOTE switch installed earlier and connect the two red wires as above

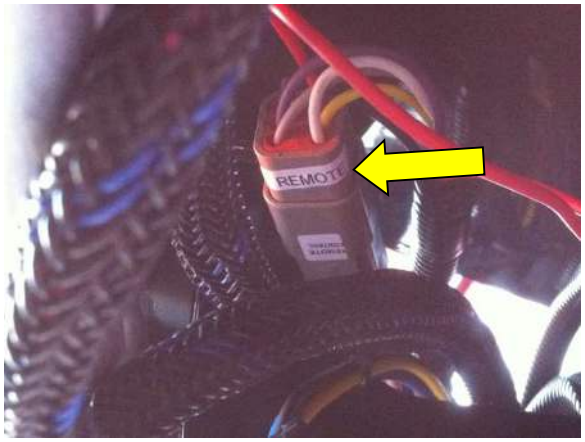


FIG. 12

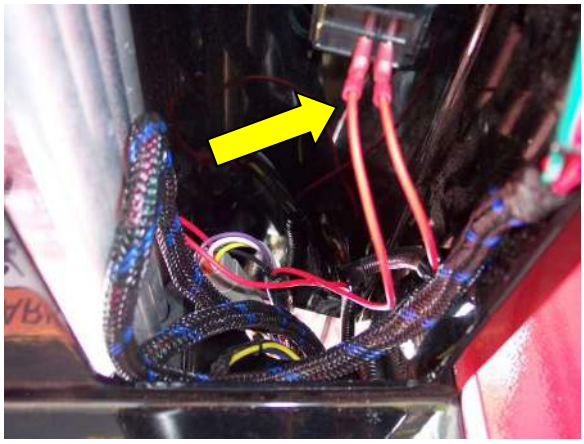


FIG. 13

CABLES (continued)

9. Inside the turret, referring to FIG. 14, locate and disconnect CONN B of the truck harness
10. Into the connector marked CONN B, connect BA from the RPM relay harness installed earlier
11. Into the other connector, plug BB from the RPM relay harness
12. Locate the connector CA previously fed into the turret and plug in CB from the RPM relay into it

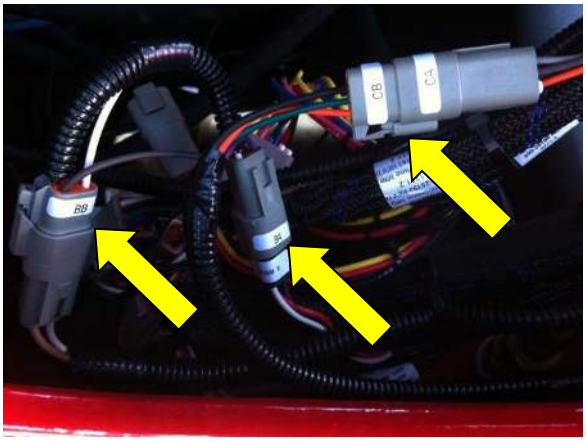


FIG. 14

CAN ACTUATOR ID ASSIGNMENT

Kar-Tech CAN Actuators are pre-assigned at the factory and labeled for each function. The following procedure is only if reassignment is required in case of actuator replacement or if two identical actuators are detected.

Note: If the receiver ever detects two or more actuators with the same ID, it will stop operation and indicate errors. The receiver tests for this every time it is powered up and continually as it runs.

Since all actuators are identical, they need to be assigned identification numbers by the receiver in order to distinguish which actuator does what function.

Using the buttons on the CAN Ranger Receiver, navigate through the LCD screens to CALIBRATION. Press <SET>. Use the arrow buttons to enter the password 1262. Enter the password by pressing <SET>. The first screen in the Menu is

ASSIGN ACTUATORS
PUSH SET

After selecting this by pushing SET, the receiver's LCD will walk the operator through the procedure. The basic idea is that all actuators need to be disconnected from the system. **This means both disconnecting the wire cable and disconnecting**

the mechanical linkage from the shaft of the actuators. Next, one by one the actuators are connected to the system. Each time the operator tells the receiver which actuator was added, the receiver will assign that actuator the appropriate function.

Things to keep in mind while concerning Actuator IDs:

- The receiver will not let you add more than one at a time.
- The receiver cannot know if you are assigning the wrong ID to an actuator. That is, if you attach the BOOM actuator and tell the receiver it is the WINCH, the receiver will treat that actuator as the WINCH and the crane will not operate correctly.
- If you skip an actuator during the assignment process, the Receiver will not know, and will not assign that actuator.
- After assigning IDs, you need to re-calibrate the actuators, or at least any new or swapped actuators.
- Leave the actuators plugged in after you add each one. No need to remove them after each step. If you do remove an actuator that has been assigned and you still need to assign other actuators. Do not plug the taught actuator back in until you have completed the ID Assign procedure and exited.

- If you leave the actuators mechanically linked to the valves during the ID step, the actuator's ZERO position may not be correct. If you get strange/incorrect position readings, this may be the reason.
- Connect all the mechanical linkages

ACTUATOR CALIBRATION

The receiver is programmed for default values for each actuator at the factory. Please refer to Appendix B for factory setting values.

PLEASE NOTE: IF THE FOLLOWING PROCEDURE IS NOT PERFORMED PRIOR TO OPERATION, THE ENGINE STOP MAY BE ON CONTINUOUSLY!

ACTUATOR CALIBRATION USING THE MANUAL HANDLES

Using the buttons on the CAN Ranger Receiver, navigate through the LCD screens to CALIBRATION. Press <SET>. Use the arrow buttons to enter the password 1262. Enter the password by pressing <SET>. Then press the right button (FWD arrow) to get to:

ACTUATOR SETUP

PUSH SET

Next presses the right button (FWD arrow) to get to the actuator you want to calibrate.

During the calibration you will be asked to calibrate center, fast, slow, and engine stop positions. These positions are defined as follow:

CENTER POSITION

This is the position the actuator moves to when the transmitter is ON and the joystick is in neutral (center position). This position is normally the valve handle in its neutral position (Valve center).

FAST POSITION

This is the position the actuator moves to when the transmitter's BOOM SPEED switch is switched to NORMAL and a joystick is pushed all the way in one direction. This position is normally the maximum travel of the valve handle.

SLOW POSITION

This is the position the actuator will move to when the transmitter's BOOM SPEED switch is switched to SLOW and a joystick is pushed all the way in one direction. This position is normally slightly below the maximum travel of the valve handle.

ENGINE STOP POSITION

This is the position of the valve handle right before hydraulics flow or function movement. The receiver commands the engine to stop if the transmitter is ON with joystick in the center and valve is moved manually or the actuator did not return to center due to mechanical

failure or binding of the valve components or actuator. Move valve handle until there is a slight motion of the boom or winch function to store value.

At the end of the calibration of each actuator, the Auto Center feature can be Enabled or Disabled for that actuator. This feature is generally enabled if the valve spring is weak.

SWING CALIBRATION

If this is the first time calibrating the actuators, start with SWING SETUP and the controller will walk you through all Enabled actuators in turn (normally 4). Once you have selected the actuator you want to calibrate push <SET> and follow the instructions on the LCD.

There are several settings for each actuator. Each has its own screen. Use the ←→ arrow buttons to scroll through the settings if you want to change or look at a specific setting. If you are setting up a new actuator, make sure to configure each setting to match your crane.

In each setting screen both the stored value and the current actuator position are shown on the second row of the display.

← (x.xx) x.xx →

The number in parentheses is the stored value. The other is the current actuator position.

Push Set to store the current position into this parameter. The receiver will automatically move to the next setting.

For example, if you selected SWING, the first screen will be for the center position. Before pressing <SET>, move the SWING Handle back and forth. The displayed position, shown in inch, should change. If not, the wrong actuator is connected to this connection, or the actuator is not functioning correctly. Try the other handles to see if the one of the other handles control the displayed position. If so, swap the actuator locations or re-ID the actuators. If no handle controls the position, make sure the actuators are linked to the valves.

If the SWING handle can change the position on the display, center the handle. It should be about 1.5 inch. Note that the actuator total travel is 3 inch; therefore 1.5 is the center position. If it is not close, adjust the linkage to the valve handles and push <SET>.

The next screen will be to set the Fast Counter Clockwise Swing. Push the SWING Handle all the way in the direction for Counter Clockwise Swing. Hold it there and push <SET>.

Next the Slow Counter Clockwise Swing needs to be set. Hold the SWING Handle in the position for slow

Counter Clockwise Swing, and press <SET>.

The next screen will be to set the Engine Stop Position for Counter Clockwise Swing. Hold the SWING Handle in the position that you want the Engine to be stopped and push <SET>.

The next screen will be to set the Fast Clockwise Swing. Push the SWING Handle all the way in the direction for Clockwise Swing. Hold it there and push <SET>.

Next the Slow Clockwise Swing needs to be set. Hold the SWING Handle in the position for slow Clockwise Swing, and push <SET>.

The next screen will be to set the Engine Stop Position as described above for Clockwise Swing. Hold the SWING Handle in this position, and push <SET>.

The next screen lets you Enable or Disable the Auto Center feature for the Swing Actuator. Push <SET> to toggle between ENABLE and DISABLE. Push → Next menu.

The final step in calibrating the SWING function is to save the settings or if you don't want to save them, just escape.

PUSH SET TO SAVE

USE ↑ TO QUIT

Pushing <SET> will save the settings. Pushing ↑ will exit the Swing Calibration and will

revert to the previous settings.

If you push <SET> the controller will automatic move to Telescope setup. If you want to calibrate the Telescope function next, push <SET>.

Repeat this procedure for the Telescope, Winch and Boom actuators. If enabled, also repeat this for Boom 2 and Telescope 2. If this is the only actuator that requires calibration or to exit calibration keep pressing the right button (FWD arrow). The Actuator calibration is now complete. Make sure crane works properly with remote before delivery.

ACTUATOR CALIBRATION USING THE TRANSMITTER

This procedure is similar to the calibration using valve handles, instead you will be using the joysticks to move the actuator to the desired position and pressing Horn button on the transmitter or SET button on the receiver will store the new position in the receiver. Actuator calibration using transmitter is normally used if valve handles are not present or not accessible. Be sure the E-STOP is up before proceeding.

RPM CALIBRATION

PLEASE NOTE: THE KAR-TECH CAN RANGER CAN BE CONFIGURED TO PROVIDE MANY DIFFERENT TYPES OF RPM SIGNALS. MAKE SURE THE SYSTEM IS CONFIGURED FOR

THE CORRECT TYPE OF OUTPUT FOR YOUR ENGINE.

The CAN Ranger is calibrated at the factory for Cummins engine. Refer to appendix B for factory setting parameters.

Using the buttons on the CAN Ranger Receiver, navigate through the LCD screens to CALIBRATION. Press <SET>. Use the arrow buttons to enter the password 1262.

To enter the password, use the → button to change which digit you are changing. Use ↑ to increase the selected digit or ↓ to decrease it. Use ← to back out of this screen and return to the Calibration Menu. Once you have changed all 4 digits, push <SET>. If you entered the correct password you get the help screen:

USE ←→ TO PICK

Then press the right button (FWD arrow) to get to the RPM SETUP screen:

RPM SETUP

← PUSH SET →

Push <SET>.

Scroll until you get the type of RPM you want. The options are:

Caterpillar

Cummins

International

Mercedes

Bump Throttle

Cruise Control

On Off Throttle

PWM

Inverted PWM

Analog

Actuator

These are followed by an exit screen if you don't want to change the RPM setting.

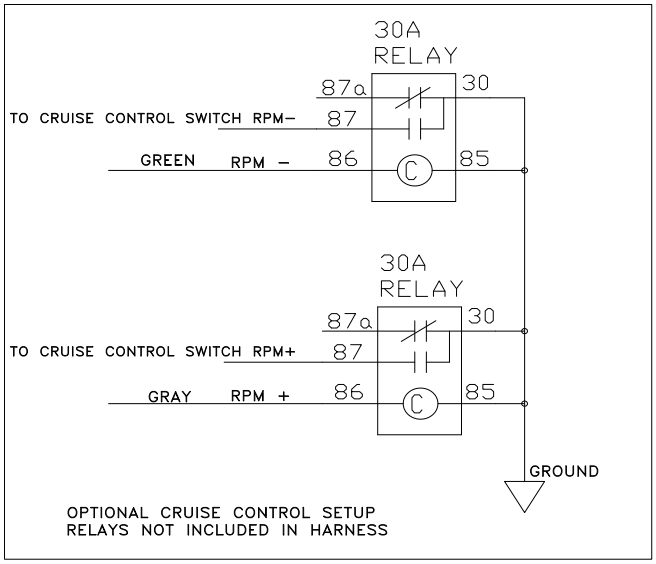
Caterpillar, Cummins, International, and Mercedes all have pre-set configurations and settings. If you have one of these engines, pick the appropriate one. Then you can fine tune the settings to match what your vehicle needs. The parameters are MINIMUM RPM (Idle), MAXIMUM RPM (Full throttle) and for Caterpillar, FREQUENCY.

Bump Throttle sends a pulse to ECM through RPM+ output (PIN 4 of connector 'CA') which increments the engine RPM to the next sequential setting. These are set in the engine, not in the Ranger II unit.

Cruise Control uses 2 On/Off outputs (Floating or BATTERY+) for increasing or decreasing the RPM. These outputs will connect BATTERY+ to outputs RPM- and RPM+ (pins 2 & 4 of CA) when the corresponding buttons are pressed on the transmitter.

The cruise control set up is used in parallel with cruise control switches on the truck which are normally connect to ground when activated to change the RPM.

Note: If you need sinking signals to your engine, use 2 relays to invert these outputs.



On Off Throttle uses 1 On/Off output (Floating or BATTERY+) for increasing or decreasing the RPM. It will connect BATTERY+ to RPM+ output (pins 4 of CA) when RPM+ button is pressed and will disconnect when RPM- button is pressed on the transmitter.

The on off Throttle is used in conjunction with optional Kar-Tech pull throttle (P/N:1A0022A) to pull the throttle to a set high RPM.

Pull Throttle P/N: 1A0022A

PWM generates a pulse width modulated output with an amplitude of BATTERY + on PWM/Analog output (Pin1 of CA). The percentage of time that it is connected to BATTERY+ is the Duty Cycle. The engine should have a pull-down resistor in its input. The parameters are MAXIMUM PWM (Full throttle), MINIMUM PWM (Idle) and FREQUENCY.

INVERTED PWM generates a sinking pulse width modulated output that is either connected to ground or is open on PWM/Analog output (Pin1of CA). The percentage of time that it is connected to ground is the Duty Cycle. The engine should have a pull-up resistor in its input. The parameters are MAXIMUM PWM (Full throttle), MINIMUM PWM (Idle) and FREQUENCY.

Analog generates a DC voltage that varies to change the engine's RPMon PWM/Analog output (Pin1 of CA). The parameters are MAXIMUM RPM (Full throttle), and MINIMUM RPM (Idle).
To change parameters, use the ← and → buttons to change digits. Use the ↑ and ↓ buttons to change the selected digit's value.

Actuator uses a CAN Actuator to control the throttle. For example it may pull a cable connected to the accelerator pedal. Follow the steps on the Display to set the Idle and Max RPM positions. When using the transmitter to set up the RPM actuator, the RPM+ and RPM- buttons move the RPM actuator out and in, by a certain step. The step size is small when the SPEED switch is in the SLOW position. The step size is larger when the SPEED switch is in the FAST position. If not using the transmitter to calibrate the RPM Actuator, just physically move the actuator into the Idle and Max

RPM positions when instructed.

After going through the selected setup screens, you have the choice to save or to quit without saving:

PUSH SET TO SAVE

PUSH ← TO QUIT

Note: If you return to the same RPM type that is currently saved, the parameters will be as they are currently set. If you change from one type of RMP to another, the parameters will revert to the default settings.

OPTION SETUP

Using the buttons on the CAN Ranger Receiver, navigate through the LCD screens to CALIBRATION. Press <SET>. Use the arrow buttons to enter the password 1262. Then press the right/FWD arrow to get to the OPTION SETUP screen:

OPTION SETUP

← PUSH SET →

Push <SET>.

After a help screen (press→ to move on), the TILT enable/disable screen will appear:

TILT DIS

THEN PUSH SET

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the Tilt function. If your crane basket has the Tilt feature and tilt valve, you want to set this to ENABLE (ENB). Otherwise disable it (DIS). If you leave it enabled but do not have the feature, you will get errors indicating that there are output errors.

When you have enabled or disabled the Tilt feature, press <SET>.

The next option is TILT AUTO. The screen will appear:

TILT AUTO DIS

THEN PUSH SET

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the Automatic Tilt feature. If your crane has the Tilt outputs, a the tilt sensor required for this feature, you want to set this to ENABLE (ENB). Otherwise disable it (DIS).

When you have enabled or disabled the TILT AUTO feature, press <SET>.

If you enabled the Automatic Tilt feature, you can set 3 parameters, TILT WINDOW, TILT DELAY, and TILT DEBOUNCE.

Tilt Window is in degrees. It is the deadband around level where no correction is made. The larger the window, the more tilt will be allowed. However, if the Tilt Window is too small, the system may start oscillating or hunting.

Tilt Delay is in ms. It is the time the bucket needs to be tilted outside the Tilt Window before a correction is made. The larger the Tilt Delay, the slower the response. However too small of a Tilt Delay could cause the system to react to noise.

Tilt Debounce is a number from 1 to 200. The Tilt Debounce is used to smooth out the angle sensor's readings. If your machine vibrates a lot, use a higher Tilt Debounce. If your machine is very stable, use a smaller Tilt Debounce. Note that the larger the Tilt Debounce, the slower the Auto Tilt feature will react.

The next option is for Input 1. The screen will appear:

INPUT 1 DISABLE

THEN PUSH SET

Use ↑ or ↓ to switch between DISABLE, ATB, and CW STOP modes for Input 1. ATB Mode monitors Input 1, and when it goes high (active), the transmitter's LEDs will alternate when a joystick is operated. In CW STOP mode,

the Ranger Controller will stop any swing CW motion by the transmitter when this input goes high (active). The output will ramp off to allow for a smooth stop. If you do not want either of these features, just disable Input 1.
When you have made your selection, press <SET>.

If you chose CW STOP, a CW RAMP screen comes up. Use the arrows to set the time for the function to go from full speed to stop. The maximum number is 2000ms (2 second). The larger the number, the longer it takes to stop moving.

The next option is for Input 2. The screen will appear:

INPUT2 DISABLE
THEN PUSH SET

Use ↑ or ↓ to switch between DISABLE, OVL, and CCW STOP modes for Input 2. OVL Mode monitors Input 2, and when it goes high (active), the transmitter's LEDs will flash together when a joystick is operated. In CCW STOP mode, the Ranger Controller will stop any swing CCW motion by the transmitter when this input goes high (active). The output will ramp off to allow for a smooth stop. If you do not want either of these features, just disable Input 2.
When you have made your selection, press <SET>.

If you chose CCW STOP, a CCW RAMP screen comes up. Use the arrows to set the time for the function to go from full speed to stop. The maximum

number is 2000ms. The larger the number, the longer it takes to stop moving.

Next the Auxiliary setup screen will appear:

AUX DISABLE

THEN PUSH SET

Use ↑ or ↓ to select between DISABLE, WINCH FAST, and TOGGLE functions. These functions are for the Auxiliary toggle switch on the transmitter and the Auxiliary output on the receiver. If your machine has the Winch Speed feature, you want to set this to WINCH FAST. If you have some other function tied to the Auxiliary output, set this to TOGGLE mode. Otherwise disable it. If you leave it enabled but do not have the feature, you will get an error indicating that there is an output error. No damage will occur.

When you have made your selection, press <SET>.

Next the TELE 2 setup screen will appear:

TELE 2 DIS

THEN PUSH SET

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the TELESCOPE #2 function (actuator). If your machine has a second boom TELESCOPE feature, you want to set this to ENABLE (ENB). Otherwise disable it. NOTE: You can use TELE 2 for another actuator controlled function you might have, other than the standard functions. If you enable TELE 2 but do not have the feature or actuator, you will get an error indicating that there is

an actuator error. No damage will occur.

When you have enabled or disabled the TELE 2 feature, press <SET>.

Next the BOOM 2 setup screen will appear:

BOOM 2 DIS

THEN PUSH SET

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the BOOM #2 function (actuator). If your machine has a second BOOM lift feature, you want to set this to ENABLE (ENB). Otherwise disable it. NOTE: You can use BOOM 2 for another actuator controlled function you might have, other than the standard functions. If you enable BOOM 2 but do not have the feature or actuator, you will get an error indicating that there is an actuator error. No damage will occur.

When you have enabled or disabled the BOOM 2 feature, press <SET>.

Next the units setup screen will appear:

UNIT ENGLISH

THEN PUSH SET

Use ↑ or ↓ to toggle between ENGLISH and METRIC for the actuator diagnostic screens.

When you have selected the units of measurement you want, press <SET>.

Next the two Reach Error parameters need to be set. The CAN Actuators will detect when they either cannot move to their commanded position, or if something moves them away from their commanded position. The CAN Actuators

will fight against this external force for REACH ERR TIME. If the CAN Actuator is more than REACH ERR WINDOW distance from the commanded position for more than REACH ERR TIME, the CAN Actuator will turn off its clutch and motor. The corresponding joystick needs to be centered and then activated again for the CAN Actuator to try to move again.

To set the REACH ERR TIME the REACH ERR TIME setup screen will appear:

REACH ERR TIME

xx.xs PUSH SET

Use ← and → to select the digit and ↑ or ↓ to increase and decrease the selected digit. Push SET when you are done.

The REACH ERR WINDOW setup screen will appear:

REACH ERR WINDOW

x.xxin PUSH SET

Use ← and → to select the digit and ↑ or ↓ to increase and decrease the selected digit. Push SET when you are done.

Next the HORN LOGIC setup screen will appear:

HORN LOGIC ENB

THEN PUSH SET

WARNING: Per ANSI standards, it is the responsibility of the operator to press horn to operate the care. This feature is factory enabled to make sure the operator pushes horn before operating the carne. Disabling this function will leave the responsibility solely on trained care operator.

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the

HORN LOGIC. When Enabled, the HORN button needs to be pushed, along with an ENABLE button for 1 second before any joystick functions can be activated. This needs to be repeated if no joystick functions are operated for more than 1 minute. If Disabled, only the ENABLE button needs pressing to activate joystick functions. The default is Enabled.

Next the START ERROR setup screen will appear:

START ERROR ENB

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the Engine Start error code. When Enabled, the receiver's red LED will blink an error if it detects a problem with the Engine Start output. When Disabled, the receiver's red LED will not blink an error if it detects a problem with the Engine Start output.

Next the STOP ERROR setup screen will appear:

STOP ERROR ENB

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the Engine Stop error code. When Enabled, the receiver's red LED will blink an error if it detects a problem with the Engine Stop output. When Disabled, the receiver's red LED will not blink an error if it detects a problem with the Engine Stop output.

Next the HORN ERROR setup screen will appear:

HORN ERROR ENB

Use ↑ or ↓ to toggle between ENABLE or DISABLE for the Horn error code. When

Enabled, the receiver's red LED will blink an error if it detects a problem with the Horn output. When Disabled, the receiver's red LED will not blink an error if it detects a problem with the Horn output.

Finally you will then have the choice to save or to quit without saving:

PUSH SET TO SAVE

PUSH ← TO QUIT

FACTORY SETTING

The **FACTORY SETTING** Menu lets you reset all the settings back to the factory default values. These include RPM setup, options, and actuator calibration.

CALIBRATION EXIT

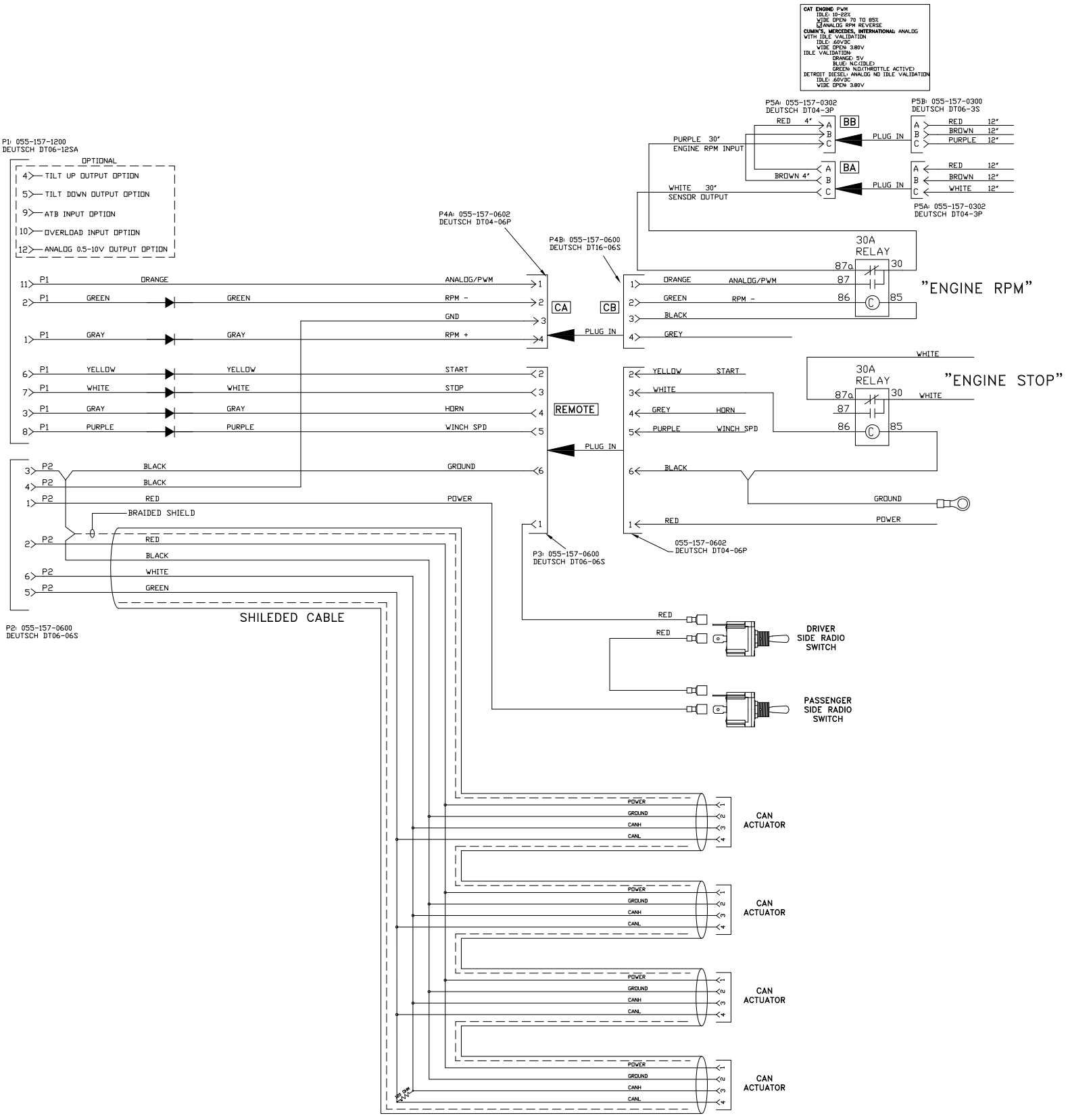
To exit the Calibration Mode, scroll to the Exit screen and push the SET button.

PARTS LIST

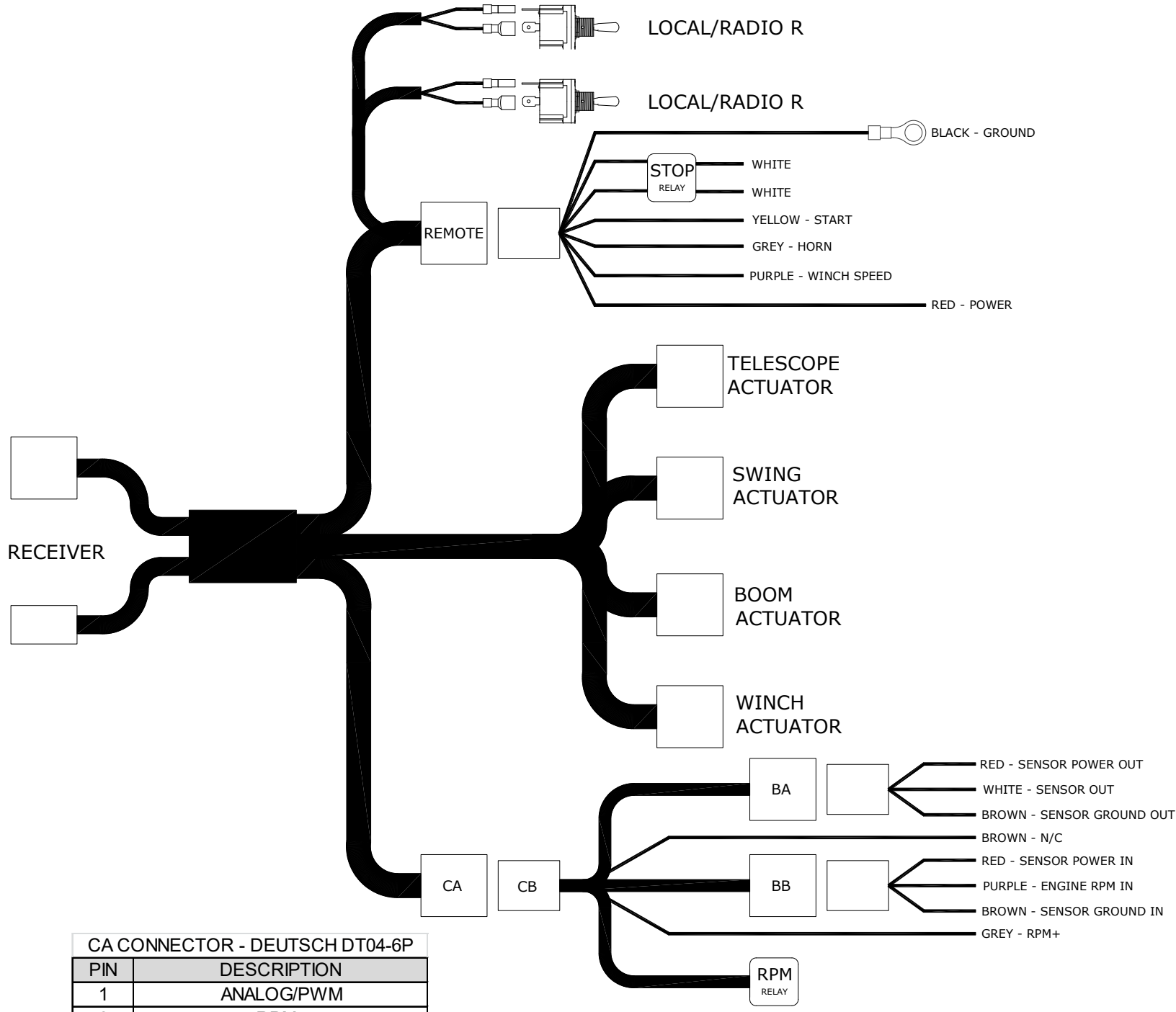
QTY	PART NUMBER	DESCRIPTION
1	B20032B	CIGARETTE PLUG CHARGER
1	3B087MA	LINKAGE KIT, ACTUATOR
1	3B1091GJ	OPERATION MANUAL
1	3B1901HK	INSTALLATION MANUAL
1	3B1906B	EXTERNAL HARNESS
1	3B1093C	RECEIVER, MAIN CONTROL
1	3B1902G	TRANSMITTER PENDANT
4	1A0014E	ACTUATOR, 90LB 3” CAN

There are no user-serviceable parts inside the transmitter, the receiver, or the actuator. Return the units for service.

WIRING SCHEMATIC

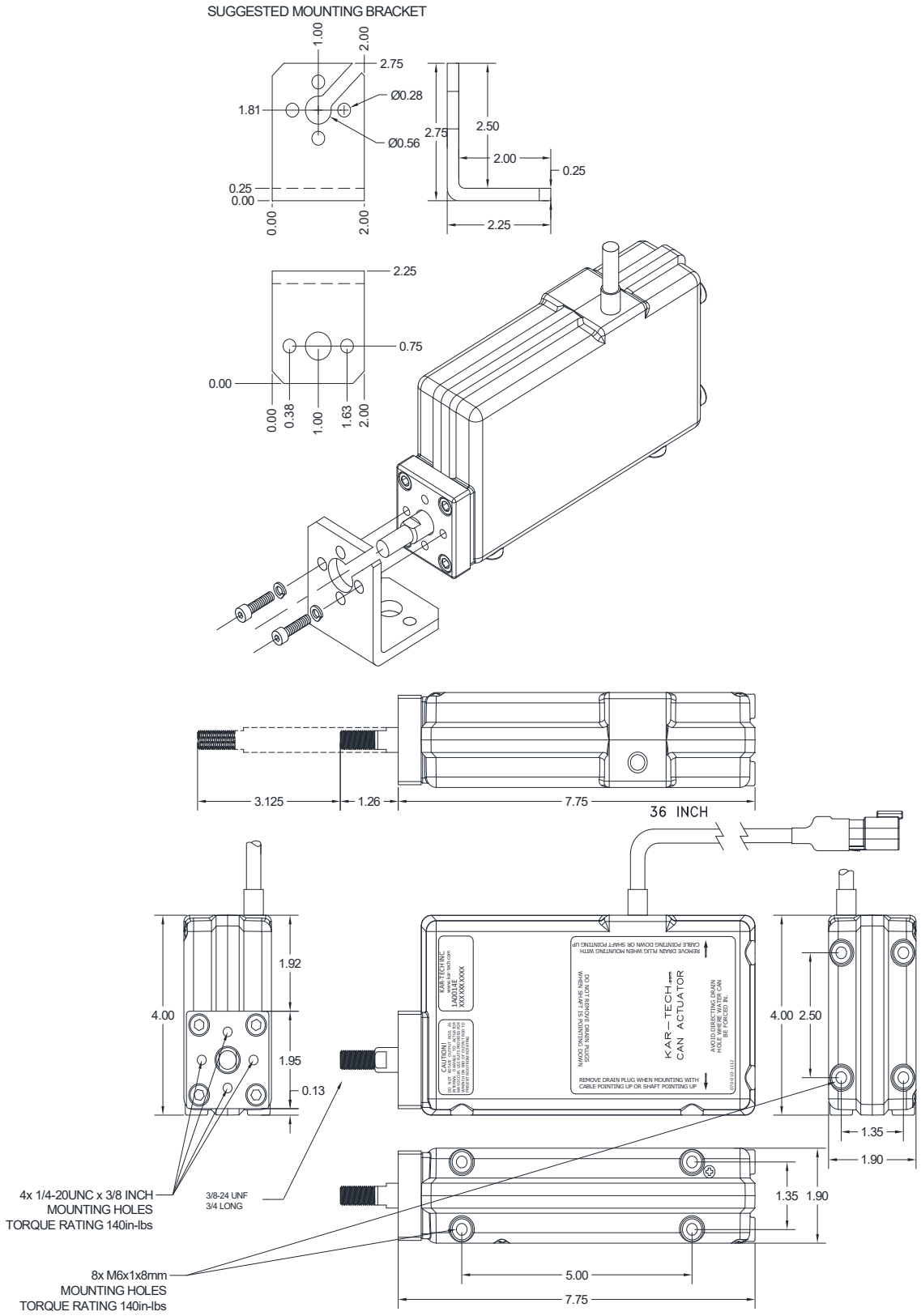


WIRING BLOCK DIAGRAM

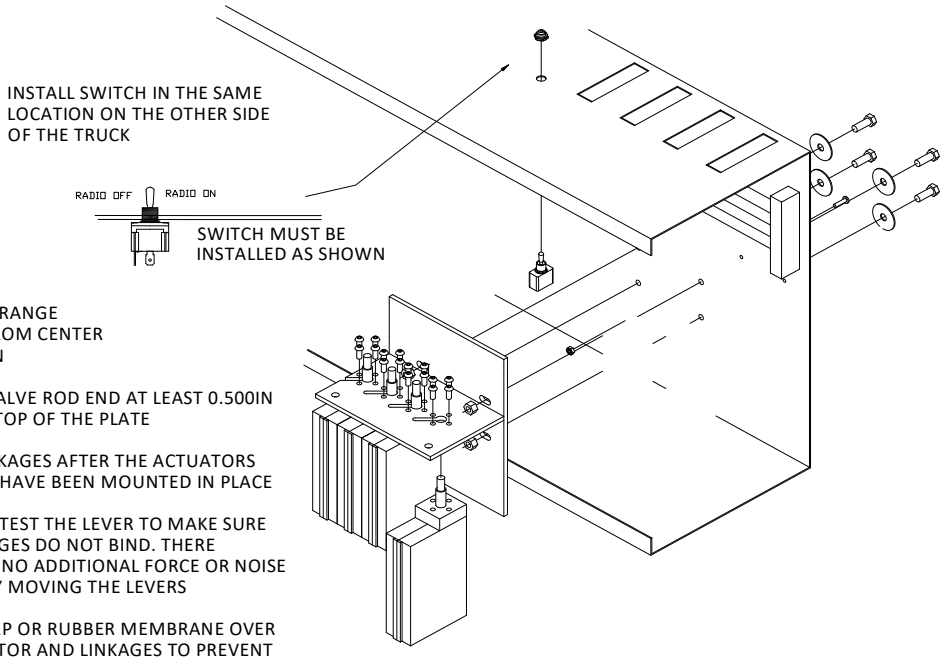


CA CONNECTOR - DEUTSCH DT04-6P	
PIN	DESCRIPTION
1	ANALOG/PWM
2	RPM -
3	GROUND
4	RPM +
5	N/C
6	N/C

LINEAR SERVO CAN ACTUATOR



ACTUATOR MOUNTIN AND BRACKET



ACTUATOR RANGE
±0.500IN FROM CENTER
MAX: 3.00IN

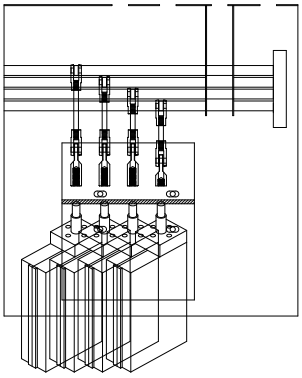
KEEP THE VALVE ROD END AT LEAST 0.500IN FROM THE TOP OF THE PLATE

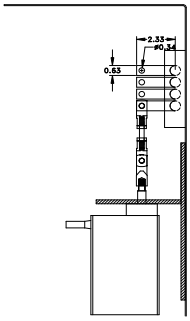
ADJUST LINKAGES AFTER THE ACTUATORS AND PLATE HAVE BEEN MOUNTED IN PLACE

MANUALLY TEST THE LEVER TO MAKE SURE THE LINKAGES DO NOT BIND. THERE SHOULD BE NO ADDITIONAL FORCE OR NOISE CREATED BY MOVING THE LEVERS

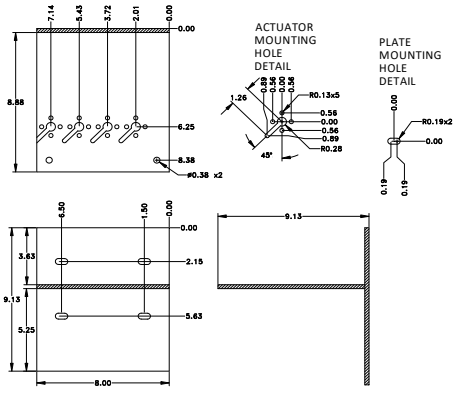
DROP A TARP OR RUBBER MEMBRANE OVER THE ACTUATOR AND LINKAGES TO PREVENT WATER AND ICE BUILD UP.

TRUCK
REAR VIEW
ACTUATOR PLATE MOUNTING



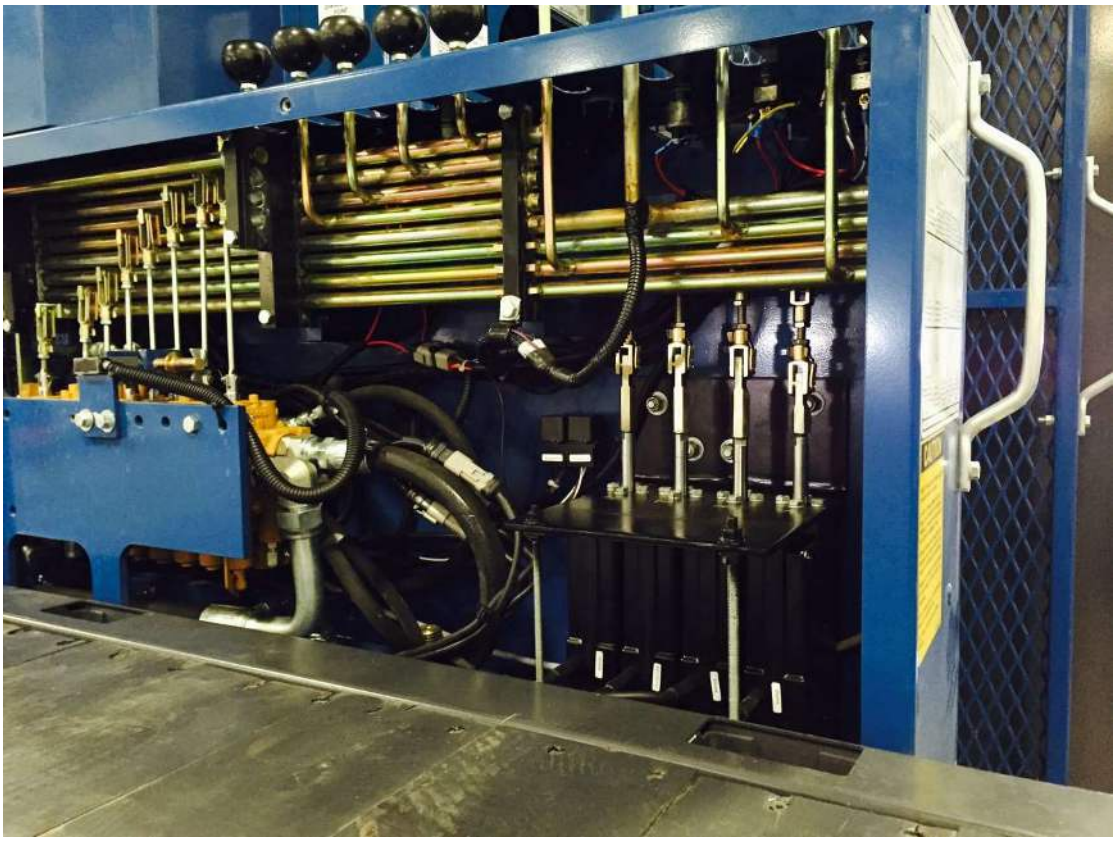


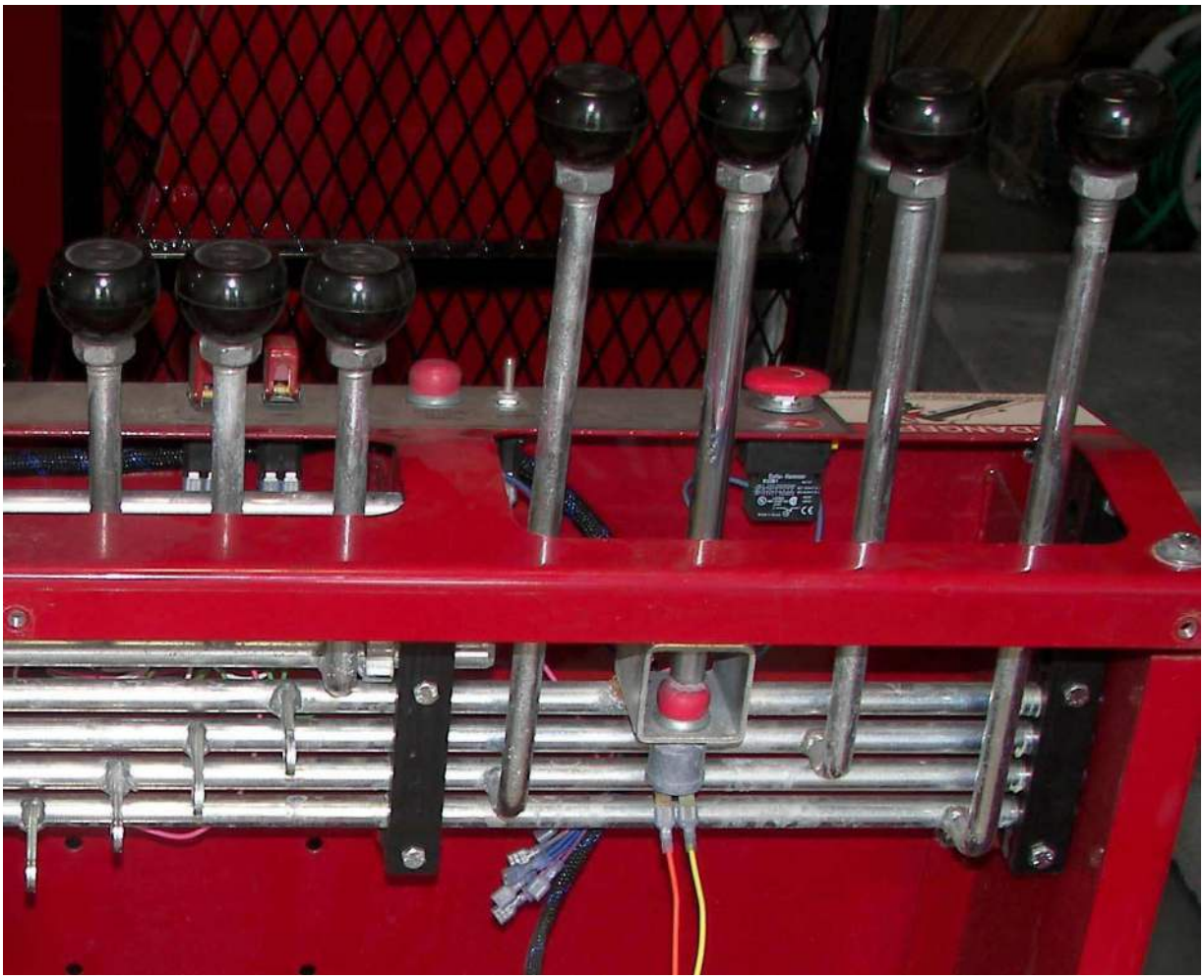
TRUCK
SIDE VIEW



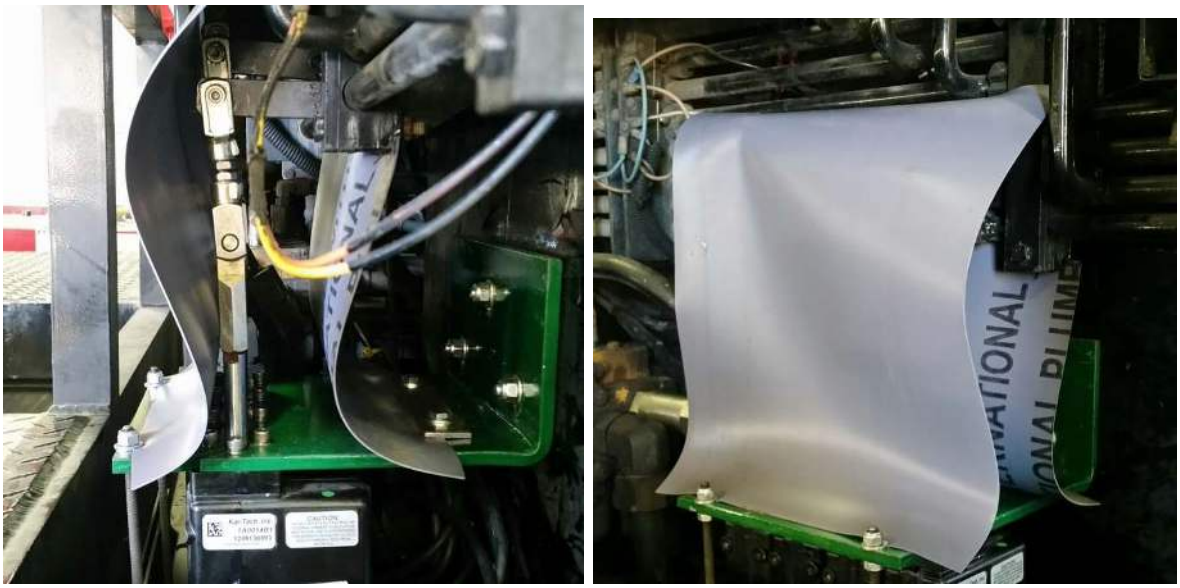
SUGGESTED ACTUATOR
MOUNTING BRACKET

TYPICAL ACTUATOR INSTALLATION PICTURES





MOUNTING TAB INSTALLATION ON TEREX



PROTECTION AGIANST WATER AND ICE BULD UP

SPECIFICATIONS

FCC ID: P4U-VRTS

Industry Canada Certification Number: 4534A-VRTS

EQUIPMENT CLASS: PART 15 SPREAD SPECTRUM TRANSMITTER

TRANSMITTER

Equipment Class ..... Part 15 Spread Spectrum Transmitter

FCC ID P4U-VRTS

ICC (Industry Canada Certification) ID 4534A-VRTS

Power supply ..... 3.7V Li-Ion Rechargeable Batteries

Charge time of batteries ..... 8 hours

Operation time with full charge ..... 50 hours continuous

Operating temperature - Radio ..... -40˚C to +85˚C

Storage temperature ..... -40˚C to +100˚C

RF Frequency ..... 902-928 MHz

RF Transmit power (EIRP) ..... 33 mW

Vibration ..... 3G to 200Hz

Shock 50G

NEMA 12

RECEIVER

Power supply voltage 9-35VDC

Operating temperature ..... -40˚C to +85˚C

Storage temperature ..... -40˚C to +100˚C

Outputs ..... 5.0A max each

Digital Inputs (when equipped) ..... supply voltage

RF Frequency ..... 902-928 MHz

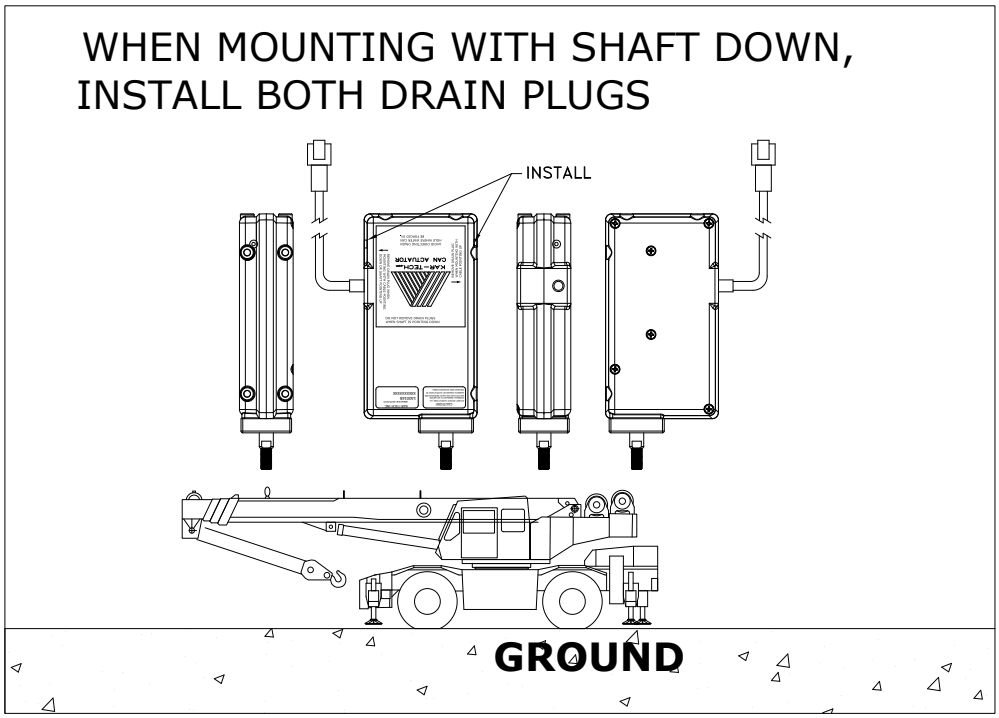
Vibration ..... 3G to 200Hz

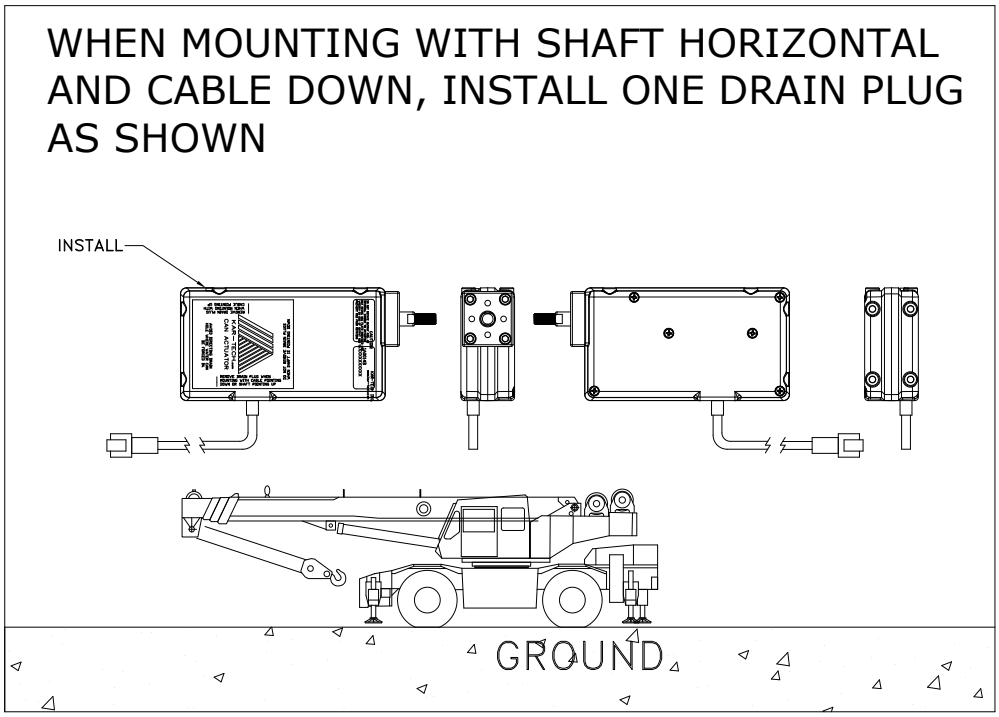
Shock 100G

NEMA 4X

Appendix A

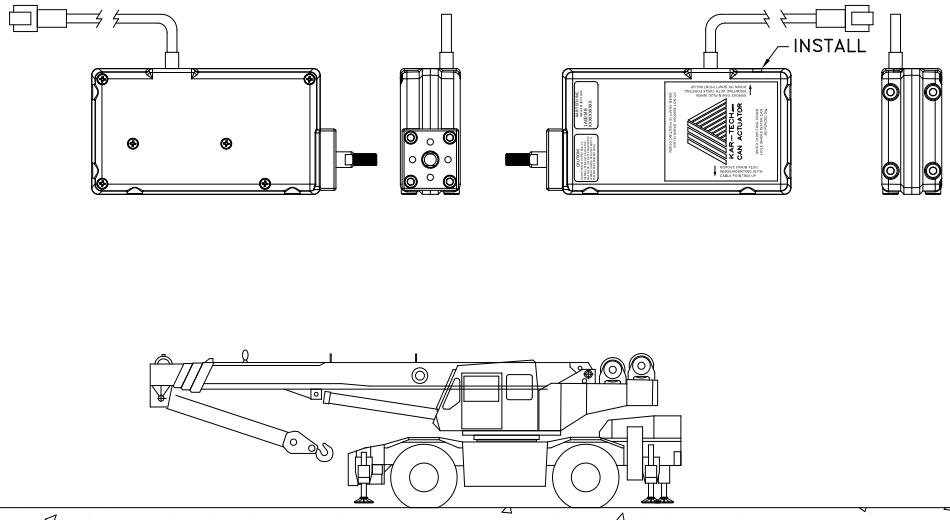
USE THE FOLLOWING INSTRUCTION TO REMOVE DRAIN PLUGS TO ALLOW MOISTURE TO EXIT OR INSTALL DRAIN PLUGS WHERE FLUIDS CAN ENTER THROUGH THE DRAIN HOLES. SHIELD DRAIN HOLES IF IT IS DIRECTED WHERE FLUIDS CAN BE FORCED IN.



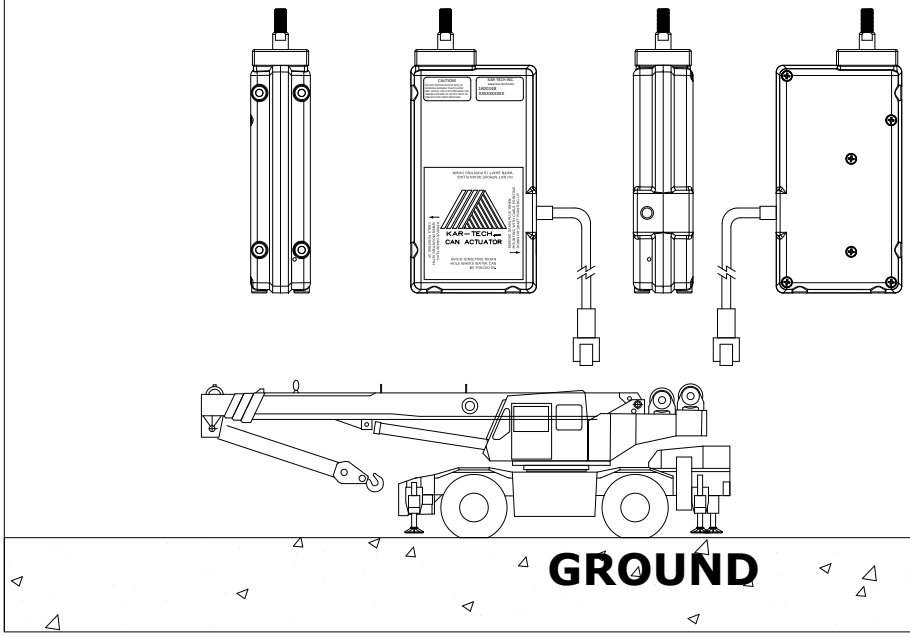


Appendix A

WHEN MOUNTING WITH SHAFT HORIZONTAL AND CABLE UP, INSTALL ONE DRAIN PLUG AS SHOWN



WHEN MOUNTING WITH SHAFT UP, REMOVE DRAIN PLUG WHICH IS NOT IN DIRECTION OF WATER GETTING FORCED IN.



Appendix B

CRANE MANUFACTURER	
CRANE MODEL	
CRANE SERIAL NUMBER	

	Factory setting	New setting
SWING CCW FAST POSITION	1	
SWING CCW SLOW POSITION	1.2	
SWING CCW ENGINE STOP POSITION	1.4	
SWING CENTER	1.5	
SWING CW ENGINE STOP POSITION	1.6	
SWING CW SLOW POSITION	1.8	
SWING CW FAST POSITION	2	
AUTO RETURN TO CENTER	ENABLE	

BOOM EXTEND FAST POSITION	1	
BOOM EXTEND SLOW POSITION	1.2	
BOOM EXTEND ENGINE STOP POSITION	1.4	
BOOM TELESCOPE CENTER	1.5	
BOOM RETRACT ENGINE STOP POSITION	1.6	
BOOM RETRACT SLOW POSITION	1.8	
BOOM RETRACT FAST POSITION	2	
AUTO RETURN TO CENTER	ENABLE	

WINCH DOWN FAST POSITION	1	
WINCH DOWN SLOW POSITION	1.2	
WINCH DOWN ENGINE STOP POSITION	1.4	
WINCH	1.5	
WINCH UP ENGINE STOP POSITION	1.6	
WINCH UP SLOW POSITION	1.8	
WINCH UP FAST POSITION	2	
AUTO RETURN TO CENTER	ENABLE	

BOOM DOWN FAST POSITION	1	
BOOM DOWN SLOW POSITION	1.2	
BOOM DOWN ENGINE STOP POSITION	1.4	
BOOM HOIST	1.5	
BOOM UP ENGINE STOP POSITION	1.6	
BOOM UP SLOW POSITION	1.8	
BOOM UP FAST POSITION	2	
AUTO RETURN TO CENTER	ENABLE	

ENGINE CALIBRATION

ENGINE	CUMMINS	
MINIMUM RPM (Idle)	0.6 V	
MAXIMUM RPM (Full throttle)	3.8 V	
FREQUENCY	N/A	