



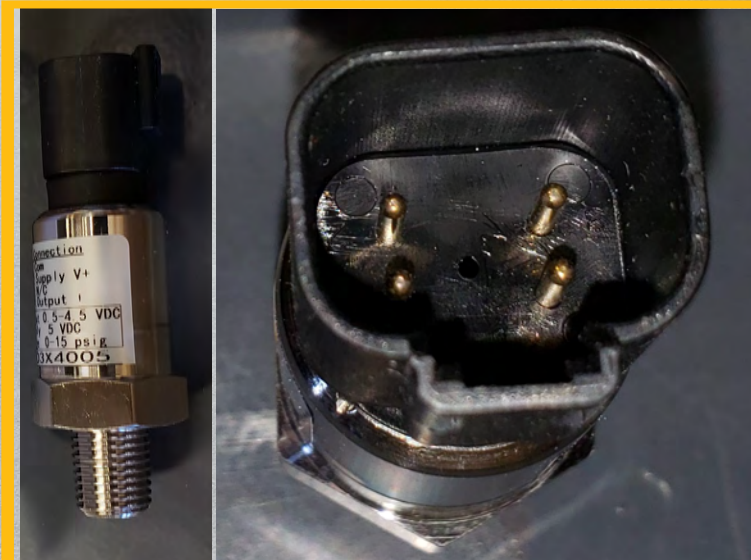
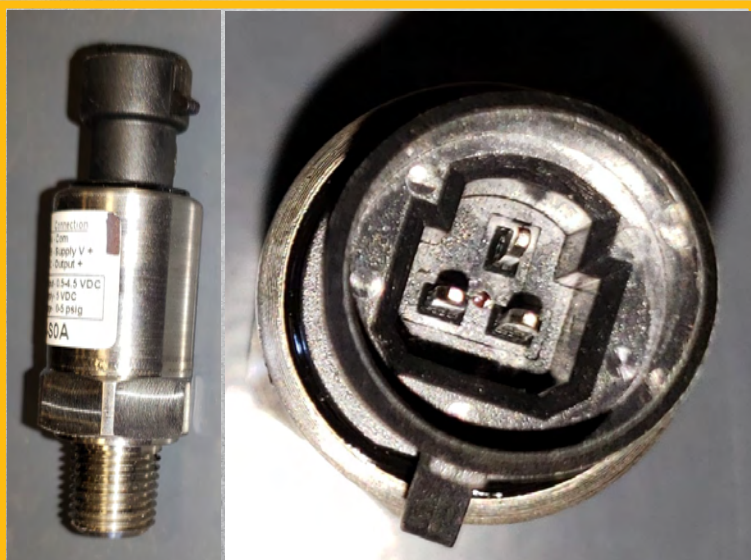
SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

PRODUCT INFORMATION BULLETIN

ANALOG SPRAY SYSTEM WATER LEVEL SENSOR UPDATE

Applicable to:

- All MEGA Analog spray control systems with FRC water level gages using part number 303822 or 304414 3 pin sensors



DEFINITIONS

WARNINGS, CAUTIONS AND NOTES:



WARNING

Operating procedures and techniques, which could result in personal injury and/or loss of life if not carefully followed.

CAUTION

Operating procedures and techniques, which could result in damage to equipment if not carefully.

NOTE

Operating procedures and techniques, which are considered essential to emphasis.

USE OF SHALL and WILL, SHOULD AND MAY:

SHALL and **WILL** – Used when application of a procedure is mandatory.

SHOULD – Used when application of a procedure is recommended.

MAY – Used to indicate an acceptable or suggested means of accomplishment.

COMMON DEFINITIONS AND ABBREVIATIONS:

VDC – Volts Direct Current,

DESCRIPTION:

The MEGA control system uses a pressure transducer to provide a voltage signal to the spray system water level gauge, the gauge will display the volume of water left in the tank. The original sensors (304414 and 303822) now has limited availability. MEGA Corp has created an updated wiring and sensor kit (053281) to upgrade to the new (308740) 4 pin sensor. This Product Information Bulletin will illustrate the process to update the sensor and wiring for the MEGA spray control water level display system.

UPDATE PROCEDURE

REQUIRED TOOLS

1. Pipe wrench or large slip joint pliers
2. Medium sized adjustable wrench wrenches
3. Thin blade, small flat tip screw driver
4. Quality wire strippers
5. Deutsch pin/socket crimping tool
6. Heat gun for heat shrink connectors
7. Teflon pipe thread sealant

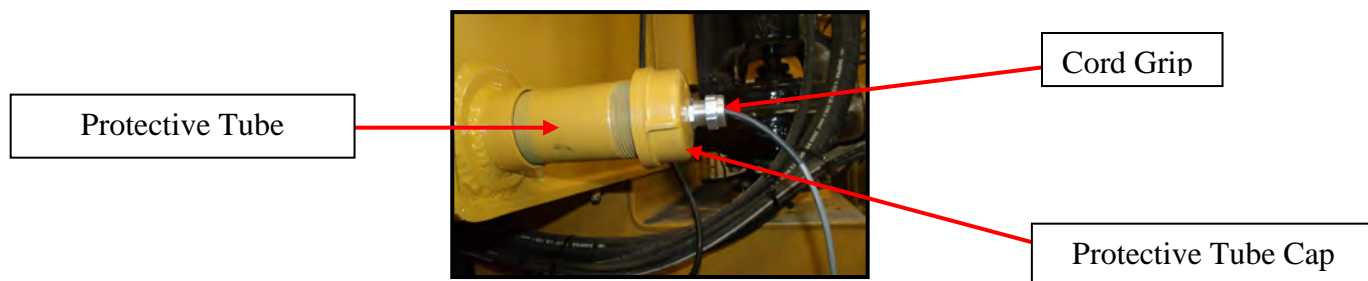
INSTRUCTIONS

1. Isolate tractor electrical power source.
 - a. Ensure tank is empty.
2. Ensure water level sensor is the cause of the failure.
 - a. Refer to the technical manuals for troubleshooting information.
3. Locate water level sensor protective tube at rear of tank if equipped.



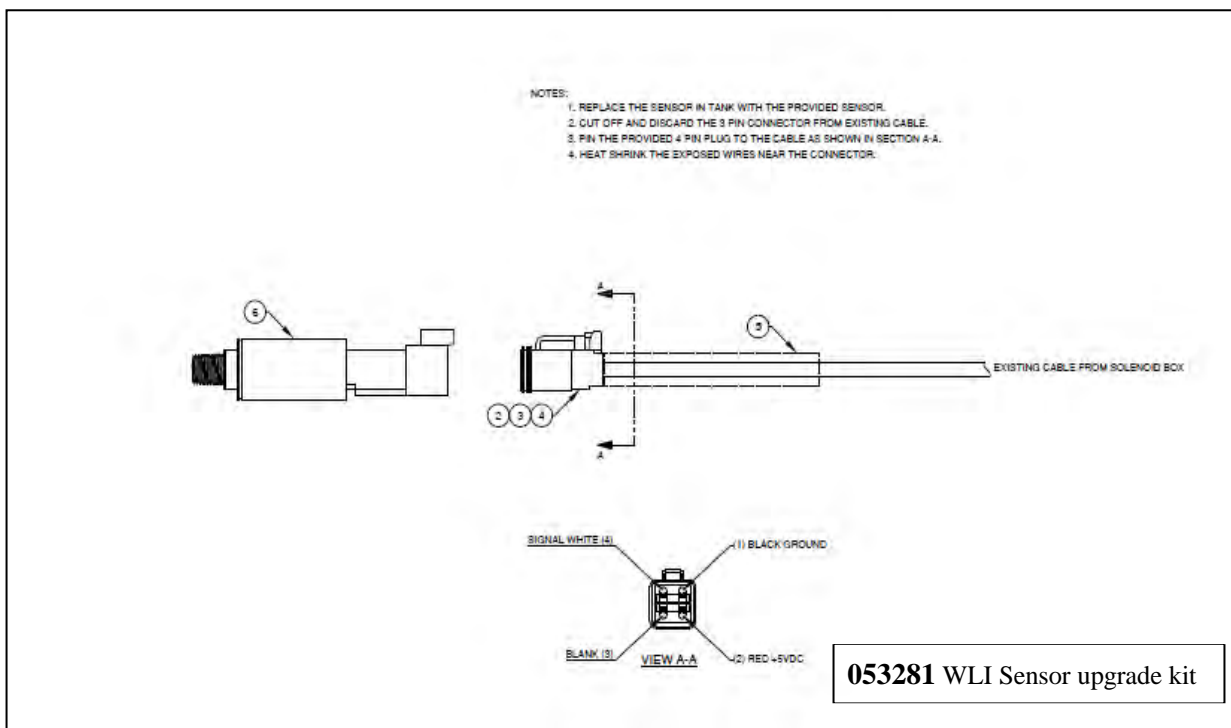
Typical location for water level
sensor protective tube

4. Loosen cord grip.
5. Remove protective tube cap.
6. Remove protective tube.



7. Disconnect water level sensor cable from sensor.
8. Remove water level sensor from threaded boss.
9. Apply thread sealant to threads of new sensor and install in threaded boss.

10. Locate water level sensor cable wiring diagram and connector kit.



11. Cut old 3 pin connector from cable.

- Inspect wiring for signs of corrosion or other damage.
 - If cable shows signs of corrosion or damage, replace cable assembly.
- Ensure there is sufficient cable to install the connector in the new sensor without pulling or stretching the cable.
 - If this is not possible it is recommended that a new water level sensor cable be installed.

12. Following the wiring diagram, install sockets to water level sensor cable.

13. Route cable through the cord grip in the protective cap.

14. Slide heat shrink tubing over cable.

15. Insert sockets in correct pin locations according to the wiring diagram.

16. Shrink heat shrink tubing on cable and plug.

17. Route cable and connector through protective tube.

18. Insert new 4 pin connector into new water level sensor.

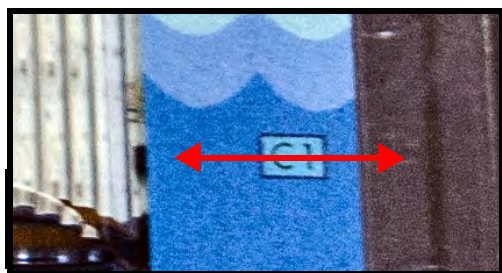
Water Level Gauge Replacement

1. Ensure that the unit is shut off, chocked, and safe for maintenance before proceeding.
2. Remove power to the cab control.
3. Remove cab control face plate to gain access to the backside of the water level indicator.
4. Disconnect the 8 pin connector from the backside of the indicator.
5. Remove the old water level indicator.
6. Install new water level indicator and secure with mount screws. The new water level indicator is a direct replacement for the old water level indicator in terms of installation.
 - a. Reconnect the 8 pin connector to the new water level indicator.
 - b. Reinstall the cab control face plate.
7. Apply power to the cab control box and allow the new indicator to warm up for at least 2 minutes. Perform water level indicator linear calibration.

Water Level Indicator Calibration (Current production models)

NOTE

The term 'swipe' means to move the tip of the calibration magnet tool up to and then away from either the **C 1** or the **C 2** sensor on the front right-hand side of the display:



Slowly Swipe in either direction

1. Fill water tank to maximum capacity.
2. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
3. Swipe the magnet four (4) times at **C 1** and four (4) times at **C 2** to enter the linear calibration mode.

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

4. Once the calibration code has been entered and linear calibration mode is active, **wait for five seconds**.
5. After five seconds, the top four and bottom four display LEDs should flash alternately on and off to indicate that the code has been accepted. **While the LEDs are still flashing**, hold the magnet steadily at **C 2** for five seconds in order to set the calibration into memory.
6. After a few seconds, the calibration mode will terminate, and all LEDs will illuminate to show that the water tank is at full capacity.
7. After performing calibration, **if and only if** the gauge shows 1 or 2 lights LESS than FULL, perform the Full Tank Correction calibration as follows:
 - a. Swipe the magnet five (5) times at **C 1** and five (5) times at **C 2** to enter the linear calibration mode. The top and bottom five display LEDs should flash on and off.

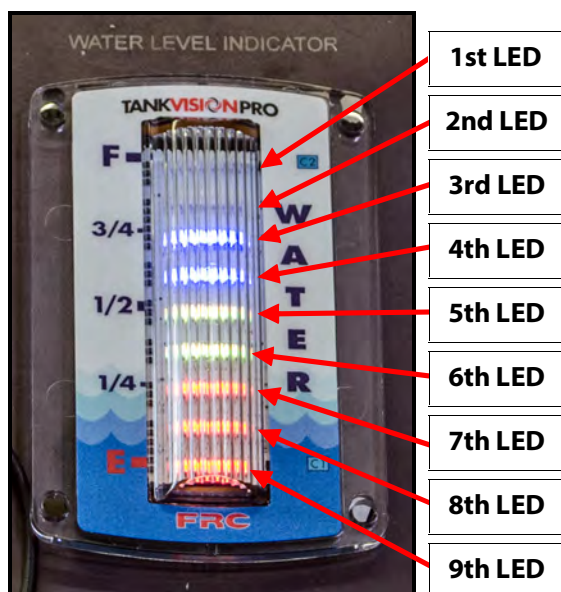
NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

- b. Wait three seconds, then hold the magnet tool at **C 2** for five seconds to complete the calibration.
- c. After six seconds, the calibration mode will terminate and all of the LEDs should illuminate to show that the water tank is at full capacity.

Water Level Indicator Diagnostic Codes

Using the 9 LEDs in the Primary Display



- **Down-chasing LEDs, then bottom two (2) flash**

Indication: Tank EMPTY words

Meaning: Gauge sees an EMPTY tank

Solution: Fill tank with water or repeat CALIBRATION procedure

- **First (1) & last (9) LEDs alternately**

Indication: No Sensor

Meaning: No sensor connected, or the sensor is defective, or an OPEN circuit in the sensor wiring

Solution: Check all connections and wiring for damage, or replace cable, or correct connection, or replace sensor, and then repeat CALIBRATION procedure

- **Third (3) & fifth (5) LEDs flash**

Indication: Data Entry Error

Meaning: Calibration was not performed properly

Solution: Repeat CALIBRATION procedure

- **Top four LEDs flash alternately with the bottom four**

Indication: Pressure Sensor High Output Voltage (voltage > 4.6V)

Meaning: Shorted wire on sensor cable or primary display failure

Solution: Check cable for short or replace cable, or replace primary display if no short is present, and repeat CALIBRATION procedure

- **Top 2/3 and bottom 2/3 LEDs alternately flash**

Indication: Memory Failure

Meaning: Primary display failure

Solution: Replace primary display and repeat CALIBRATION procedure

Water Level Indicator Display Adjustment

NOTE

The term 'swipe' means to move the tip of the calibration magnet tool up to and then away from either the **C 1** or the **C 2** sensor on the front right-hand side of the display:



Slowly *Swipe* in either direction

A light sensor allows the indicator display to switch automatically between the two modes.

It is highly recommended to set the brightness levels of both modes to the minimum value (brightness level 1 on a scale of 1-10 with 10 being the brightest) as the default setting is bright enough to induce discomfort.

1. Turn SYSTEM ON and allow the system to warm up for at least two (2) minutes.

2. Swipe the magnet three (3) times at **C 1** and one (1) time at **C 2** to enter the linear calibration mode. After a few seconds, the top three LEDs and the very bottom LED should flash on and off.

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

3. Enable brightness setting entry by holding the magnet tool at **C 2** for 5 seconds.
4. Adjust the brightness by swiping the magnet tool at **C 1** until the brightness level reaches its minimum value (1).
5. Save the new brightness setting by holding the magnet tool at **C 2** for 5 seconds.

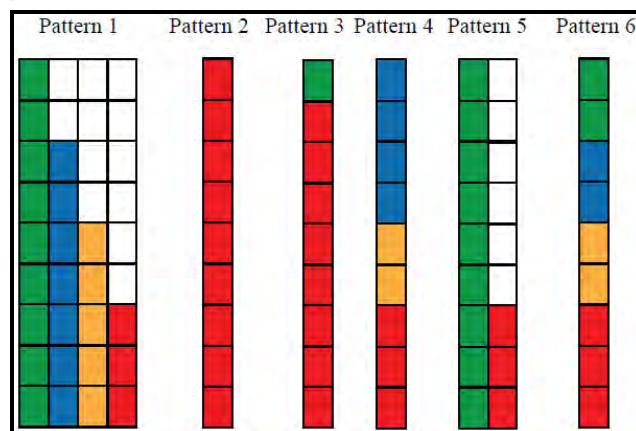
1. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.

2. Swipe the magnet three (3) times at **C 1** and two (2) times at **C 2** to enter the linear calibration mode. After a few seconds, the top three LEDs and the bottom two LEDs should flash on and off.

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

3. Enable brightness setting entry by holding the magnet tool at **C 2** for 5 seconds.
4. Adjust the brightness by swiping the magnet tool at **C 1** until the brightness level reaches its minimum value (1).
5. Save the new brightness setting by holding the magnet tool at **C 2** for 5 seconds.

The water level indicator display has six (6) total color patterns to select from. The default is Pattern 1:



PATTERN 1: One solid color, color changes depending on water level:

- FULL – green
- 3/4 tank – blue
- 1/2 tank – orange
- 1/4 tank – red
- EMPTY – red.

PATTERN 2: All red

PATTERN 3: Top 1/8 water level is green, below that is red

PATTERN 4: Three colors: blue\orange\red

PATTERN 5: All green, turns red when water level is detected to be at or below 1/4 tank.

PATTERN 6: Four fixed colors for each 1/4 tank increment: green\blue\orange\red

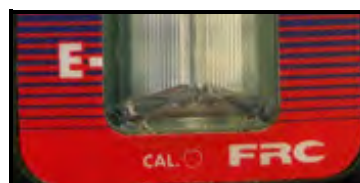
1. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
2. Select one of the color pattern settings as follows:
 - a. Swipe the magnet one (1) time at **C 1** and one (1) time at **C 2** to select **Pattern 1**
 - b. Swipe the magnet one (1) time at **C 1** and two (2) times at **C 2** to select **Pattern 2**
 - c. Swipe the magnet one (1) time at **C 1** and three (3) times at **C 2** to select **Pattern 3**
 - d. Swipe the magnet one (1) time at **C 1** and four (4) times at **C 2** to select **Pattern 4**
 - e. Swipe the magnet one (1) time at **C 1** and five (5) times at **C 2** to select **Pattern 5**
 - f. Swipe the magnet one (1) time at **C 1** and six (6) times at **C 2** to select **Pattern 6**

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

PREVIOUS MODEL WATER LEVEL GAUGE

1. Remove power to the cab control.
2. Remove cab control face plate to gain access to the backside of the water level gauge.
3. Disconnect the 8 pin connector from the backside of the gauge.
4. Remove the old water level gauge.
5. Installed new water level gauge and secure with mount screws.
6. Reconnect the 8 pin connector to the new water level gauge.
7. Reinstall the cab control face plate.
8. Apply power to the cab control and allow the new gauge to warm up for 3 to 5 minutes.
9. Perform water level gauge QUICK calibration with the magnet calibration tool as follows:
 - a. Fill water to maximum capacity.
 - b. Turn SYSTEM ON for at least 2 minutes.
 - c. Slowly swipe the magnet 4 times over the CAL label at the bottom of the gauge as shown below. Each time you swipe a red flashing light will illuminate on the gauge.



**Slowly Swipe in
either direction**

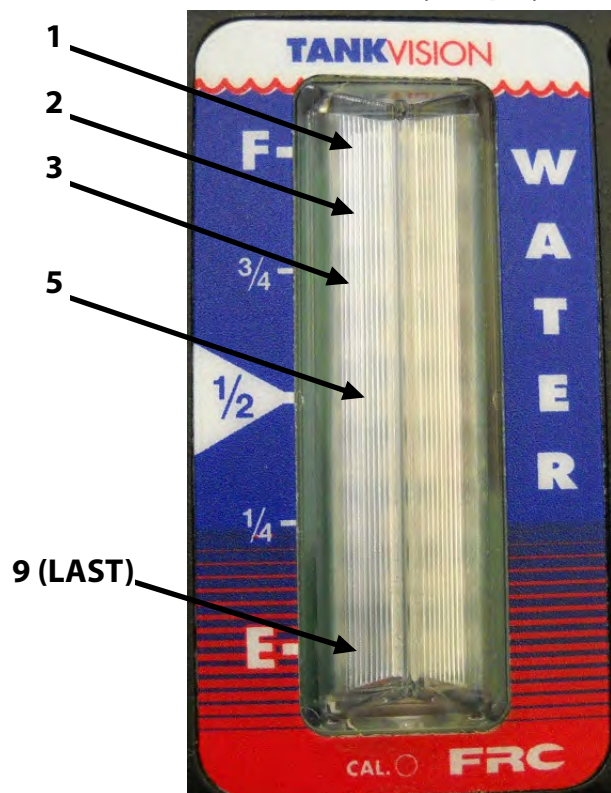
- d. Wait 3 seconds with four lights illuminated on the gauge and swipe a magnet 4 times again over the CAL label.
- e. Wait 2 seconds and the gauge should read full.

NOTE

IF, after performing calibration the gauge shows 1 or 2 lights LESS than FULL, swipe the magnet five (5) times, wait 3 seconds then swipe five (5) times again to correct the scale.

DIAGNOSTIC CODES

(There are 9 LEDs in the Primary Display)



1. Down-chasing LEDs, then bottom two (2) flash

Indication: Tank EMPTY

Meaning: TANK VISION sees an EMPTY tank

Solution: Fill tank with water or repeat CALIBRATION procedure

1. Down-chasing LEDs, then bottom two (2) flash

Indication: Tank EMPTY

Meaning: TANK VISION sees an EMPTY tank

Solution: Fill tank with water or repeat CALIBRATION procedure

2. First (1) & last (9) LEDs flash alternately

Indication: No Sensor

Meaning: NO sensor connected, or the sensor is defective, or an OPEN circuit in the sensor wiring

Solution: Check all connections and wiring for damage or replace cable or correct connection or replace sensor and repeat CALIBRATION procedure

3. Third (3) & fifth (5) LEDs flash

Indication: Data Entry Error

Meaning: Calibration was not performed properly

Solution: Repeat CALIBRATION procedure

4. Top four LEDs flash alternately with the bottom four

Indication: Pressure Sensor High Output Voltage (voltage > 4.6V)

Meaning: Shorted wire on sensor cable or primary display failure

Solution: Check cable for short or replace cable, or replace primary display if no short is present, and repeat CALIBRATION procedure

5. Top 2/3 and bottom 2/3 LEDs alternately flash

Indication: Memory Failure

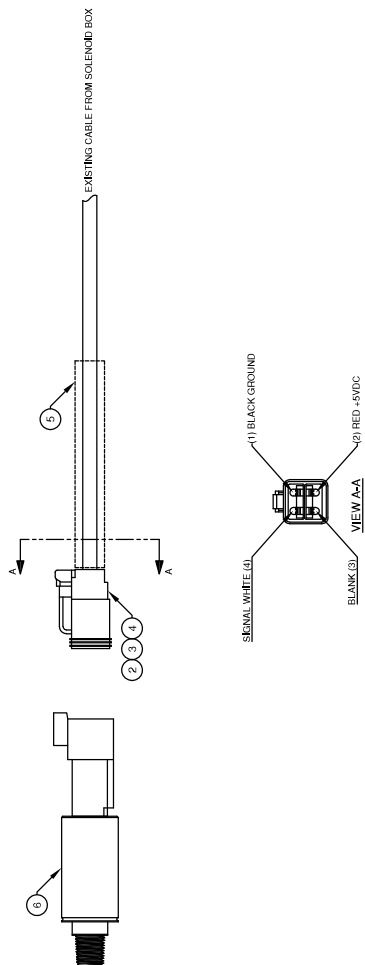
Meaning: Primary display failure


Solution: Replace primary display and repeat CALIBRATION procedure

BILL OF MATERIAL					
No.	Part No.	PART NAME	QTY	REF No.	WT.
1	304468	PLUG, 4 CON, DEUTSCH	1		STK
2	304469	LOCK, 4 CON, SECONDARY	1		STK
3	302380	SOCKET, DEUTSCH, 16-18 AWG	3		STK
4	304471	BLANKING PIN, DEUTSCH	1		STK
5	304727	HEAD SHANK, 3/4" x 1"	2		STK
6	308740	SENSOR R-15 (PIN 120° TANK)	1		STK

NOTES:

1. REPLACE THE SENSOR IN TANK WITH THE PROVIDED SENSOR.
2. CUT OFF AND DISCARD THE 3 PIN CONNECTOR FROM EXISTING CABLE.
3. PIN THE PROVIDED 4 PIN PLUG TO THE CABLE AS SHOWN IN SECTION A-A.
4. HEAT SHRINK THE EXPOSED WIRES NEAR THE CONNECTOR.



		TOLERANCE: UNLESS OTHERWISE SPECIFIED	
3 PLACES: 0.010	2 PLACES: 0.03	ANGULAR: 1°	
NAME OF THE PROPERTY OF MIRA NAME OF THE MANUFACTURER OF THE PART NAME OF THE COMPANY TO WHICH THE PART CONVEYS TO MIRA CORPORATION			
100 Cass Ave., El Cerrito, CA 94530 (415) 436-1700		DRAWING NO. 053281	
QUANTITY	UNIT	DATE	DWG. NO.
SCREWDRIVER	PCS	5/15/16	053281