



Watchdog™ Super Elite

BUCKET ELEVATOR & BELT CONVEYOR

HAZARD MONITORING SYSTEM



Operation Manual Supplement

SENSOR WIRING DIAGRAMS

Part No.'s - WDC4V4C, WDC4V46C

www.go4b.com/usa

	 WARNING
	<p>Rotating parts can crush, cut and entangle.</p> <p>Do NOT operate with guard removed.</p> <p>Lockout power before removing guard or servicing.</p>

 DANGER	
	
<p>Exposed moving parts will cause severe injury or death.</p> <p>Lockout power before removing cover or inspection door.</p>	

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Dear 4B Customer:

Congratulations on your purchase. 4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

SAFETY NOTICE TO OUR CUSTOMERS

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. (Please see the article "Hazard Monitoring Equipment Selection, Installation and Maintenance" at www.go4b.com.) The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

CUSTOMER SAFETY RESPONSIBILITIES

1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product.

2. YOU BEST UNDERSTAND YOUR NEEDS

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with Local and National Electrical Codes, all relevant OSHA Regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the free 24-hour hotline number (309-698-5611).

6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615) or call us via our 24-hour hotline number in the USA (309-698-5611). Please have available product part numbers, serial numbers, and approximate date of installation.

ELECTRICAL CONNECTION

All wiring must be in accordance with local and national electrical codes and should be undertaken by an experienced and qualified electrician.

Always use dust/liquid tight flexible metal conduit with approved fittings to protect the sensor cables. Use rigid metal conduit to protect the cables from the sensors to the control unit. Conduit systems can channel water due to ingress and condensation directly to sensors and sensor connections which over time will adversely affect the performance of the system. As such, the installation of low point conduit drains is recommended for all sensors.

All electrical connections are made via 3 sets of terminals provided as shown in image 1.

FUSE RATINGS -

In order to maintain the product certification, all fuses **MUST** be replaced with equivalent fuses at the same rating. Failure to do so will invalidate the certification and any warranties which may exist.

Model WDC4V4C -

- F1, F2, F3, F5 200 mA maximum.
- F1 to F3 are used to limit the current available to the sensor inputs.
- F5 is used to limit the current available to the internal electronics.
- F6 is not used.

Model WDC4V46C -

- F1 to F3 2 amp maximum, used to limit the current available to the sensor inputs.
- F5 200 mA, used to limit the current available to the internal electronics.
- F6 2 amp maximum, used to protect the AC power supply.

NOTE

To calibrate speed and utilize the Watchdog's built-in alarm and shut-down capabilities, a motor interlock (run) signal is required. For typical motor interlock wiring examples, review the wiring diagrams for terminals 6 & 7 in the WDC4 manual (section 9).

NOTE

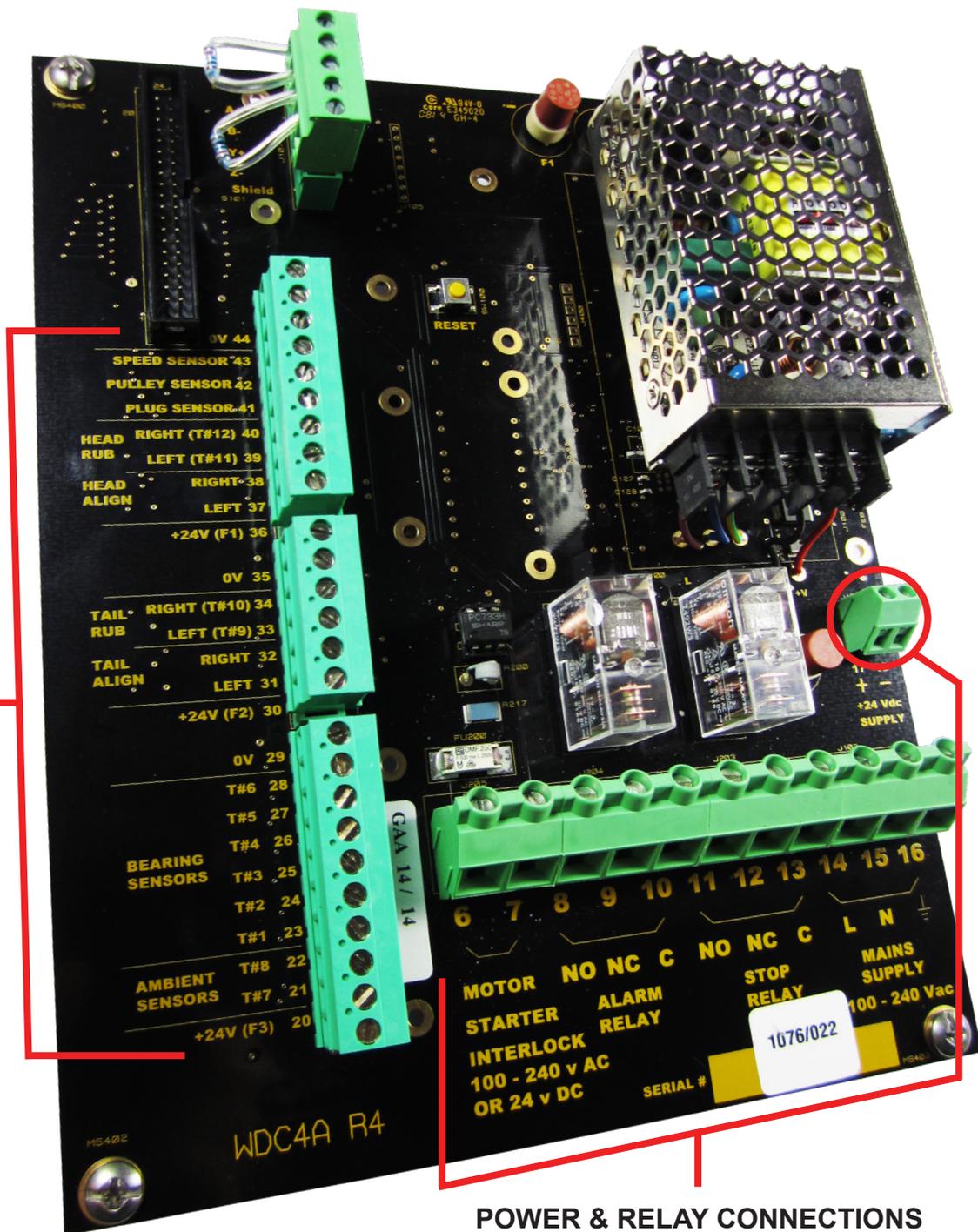
Recommended cable type is Belden 5508FE with 10 conductors each 22 AWG, shielded. Overall outer diameter is 0.23 inches. Belden 5508FE wire colors are used in all of the sensor wiring diagrams

⚠ WARNING

The unit should ONLY be powered with either a main supply (WDC4V46C model) OR a 24 VDC (WDC4V4C and WDC4V46C models) NOT BOTH.

FIELD WIRING CONNECTIONS

- 44 - 0 VDC
- 43 - Speed Sensor
- 42 - Pulley Sensor
- 41 - Plug Sensor
- 40 - Head Rub - Right
- 39 - Head Rub - Left
- 38 - Head Align - Right
- 37 - Head Align - Left
- 36 - 24 VDC (Fuse F1)
- 35 - 0 VDC
- 34 - Tail Rub - Right
- 33 - Tail Rub - Left
- 32 - Tail Align - Right
- 31 - Tail Align - Left
- 30 - 24 VDC (Fuse F2)
- 29 - 0 VDC
- 28 - Bearing Sensor 6
- 27 - Bearing Sensor 5
- 26 - Bearing Sensor 4
- 25 - Bearing Sensor 3
- 24 - Bearing Sensor 2
- 23 - Bearing Sensor 1
- 22 - Ambient Sensor 2
- 21 - Ambient Sensor 1
- 20 - 24 VDC (Fuse F3)



**Image 1 -
Inside View - Bottom Board
WDC4 Wiring Connections**

POWER & RELAY CONNECTIONS

- 06 - Motor Starter Interlock (-)
- 07 - Motor Starter Interlock (+)
- 08 - Alarm Relay Normally Open
- 09 - Alarm Relay Normally Closed
- 10 - Alarm Relay Common
- 11 - Stop Relay Normally Open
- 12 - Stop Relay Normally Closed
- 13 - Stop Relay Common
- 14 - 120 to 240 VAC Connection
- 15 - VAC Neutral Connection
- 16 - Ground or 0 Volt Connection
- 17 - 24 VDC Connection (+)
- 18 - 24 VDC Connection (-)

PRE-SET PROFILES

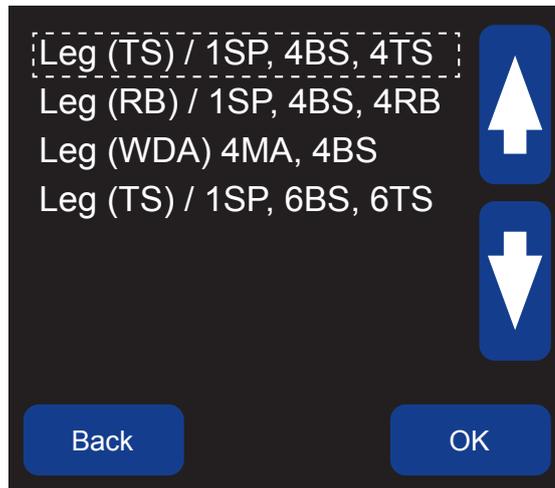


Image 2
Profile - Select New Profile

SELECT NEW PROFILE -

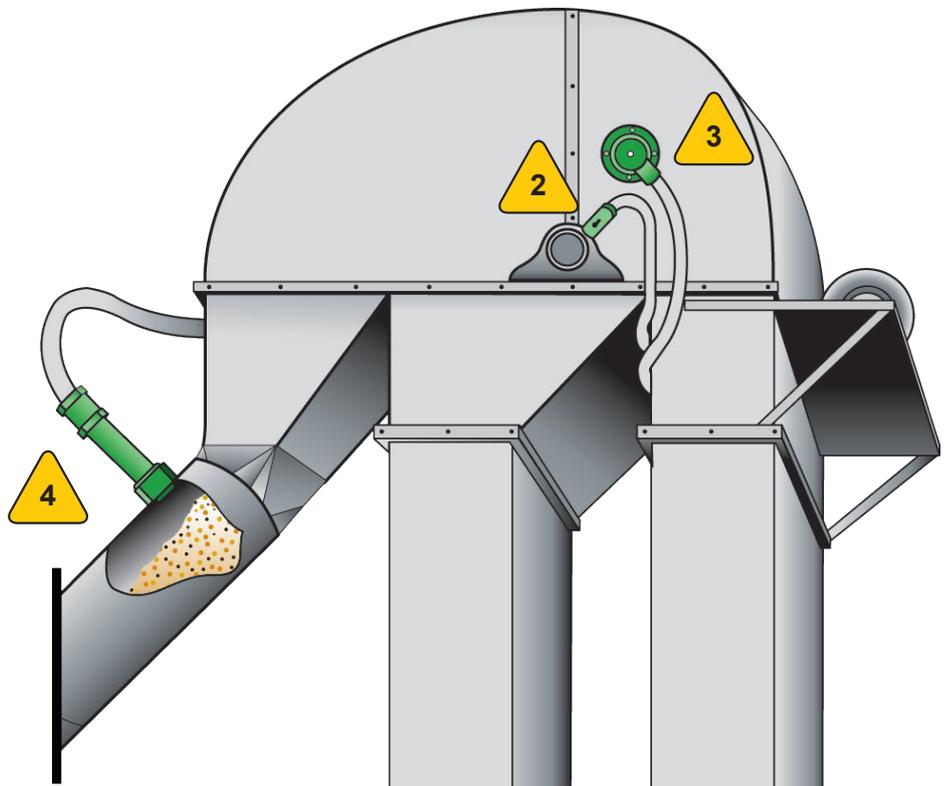
MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE

To help make the set up process easier for bucket elevator legs, four pre-set program profiles are available to choose from (Image 2). All four profiles are highlighted in RED at the top of each wiring diagram (xxxxx). Refer to section 14 of the WDC4 Watchdog Super Elite product manual for more information regarding sensor settings.

1. LEG (TS) / 1 SP, 4BS, 4TS
 - 1 Speed Sensor
 - 4 Bearing Temperature Sensors
 - 4 Touchswitch Sensors (Alignment)
2. LEG (RB) / 1SP, 4BS, 4RB
 - 1 Speed Sensor
 - 4 Bearing Temperature Sensors
 - 4 Rub Block Sensors (Alignment)
3. LEG (WDA) 4MA, 4BS
 - 4 Motion Alignment Sensors
 - 4 Bearing Temperature Sensors
4. LEG (TS) / 1SP, 6BS, 6TS
 - 1 Speed Sensor
 - 6 Bearing Temperature Sensors
 - 6 Touchswitch Sensors (Alignment)

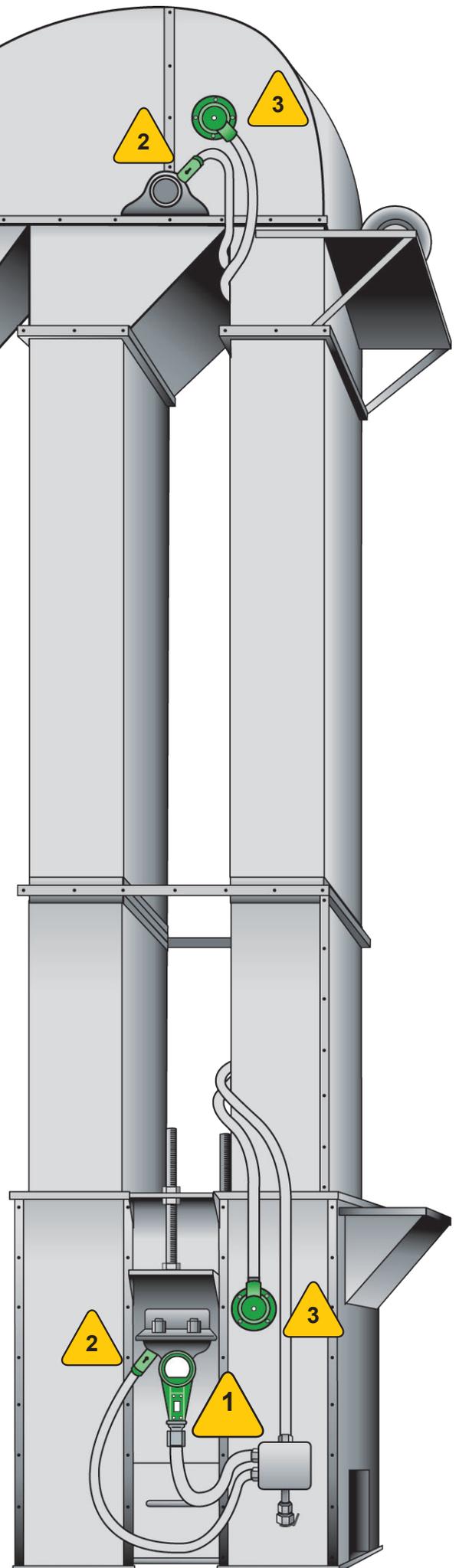
NOTE

All pre-set program profiles default to the factory settings. To modify settings from the factory defaults, go to the EDIT SELECTED PROFILE menu.



TYPICAL SENSOR PLACEMENT FOR BUCKET ELEVATORS

- 
SPEED MONITORING
 Qty. 1 - One sensor located on either side of the tail or boot shaft.
- 
BEARING TEMPERATURE
 Qty. 4 - One sensor for the bearings at each end of the drive and tail or head and boot shafts.
- 
BELT MISALIGNMENT
 Qty. 4 - Sensors work in pairs, one for each side of the belt on the drive and tail or head and boot sections.
- 
PLUG INDICATION
 Qty. 1 - One sensor located near the top of the drive section or spouting by the discharge.

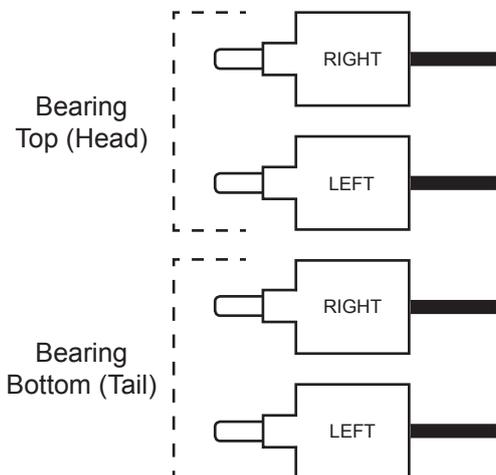
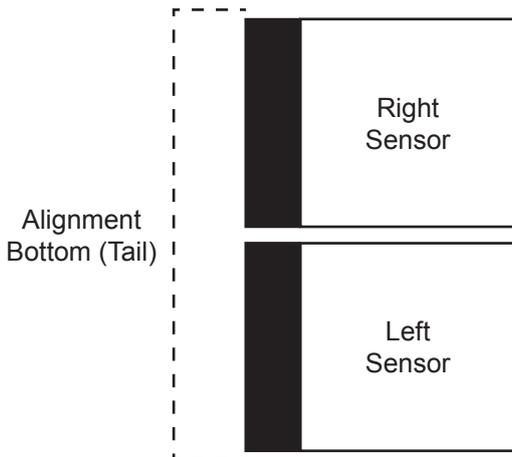
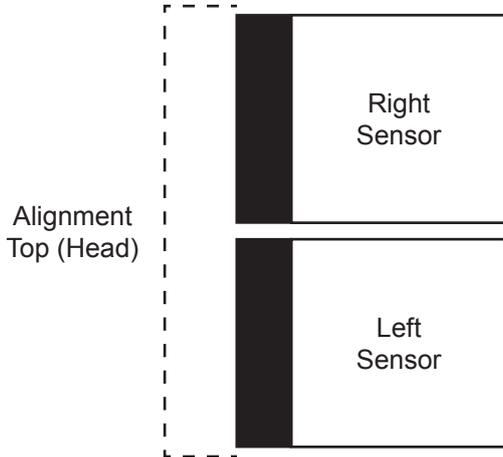


1. WDC3 (RETIRED MODEL) TO WDC4 SENSOR WIRING DIAGRAM

MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE > LEG (WDA) 4MA, 4BS

NOTE

This wiring diagram is for end users upgrading their WDC3 Watchdog to the WDC4 Watchdog Super Elite. This basic diagram provides a quick terminal reference between the two models.



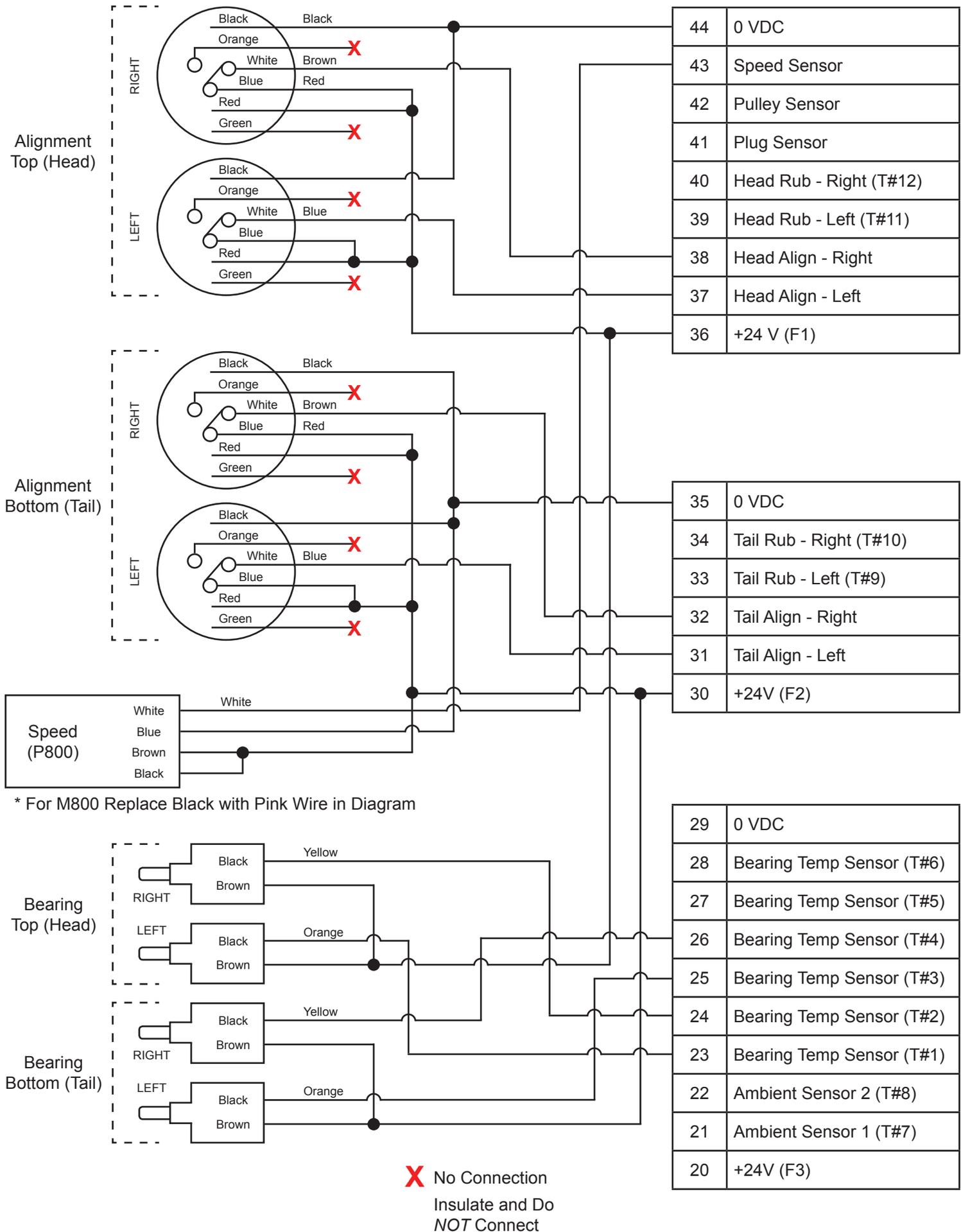
WDC3	WDC4	WDC4 Terminal
1	44	0 VDC
----	43	Speed Sensor
----	42	Pulley Sensor
----	41	Plug Sensor
----	40	Head Rub - Right (T#12)
----	39	Head Rub - Left (T#11)
3A	38	Head Align - Right
2A	37	Head Align - Left
5 (1)	36	+24 VDC (F1)

WDC3	WDC4	WDC4 Terminal
1	35	0 VDC
----	34	Tail Rub - Right (T#10)
----	33	Tail Rub - Left (T#9)
3B	32	Tail Align - Right
2B	31	Tail Align - Left
5 (1)	30	+24 VDC (F2)

WDC3	WDC4	WDC4 Terminal
----	29	0 VDC
----	28	Bearing Temp Sensor (T#6)
----	27	Bearing Temp Sensor (T#5)
4D	26	Bearing Temp Sensor (T#4)
4C	25	Bearing Temp Sensor (T#3)
4B	24	Bearing Temp Sensor (T#2)
4A	23	Bearing Temp Sensor (T#1)
----	22	Ambient Sensor 2 (T#8)
----	21	Ambient Sensor 1 (T#7)
----	20	+24 VDC (F3)

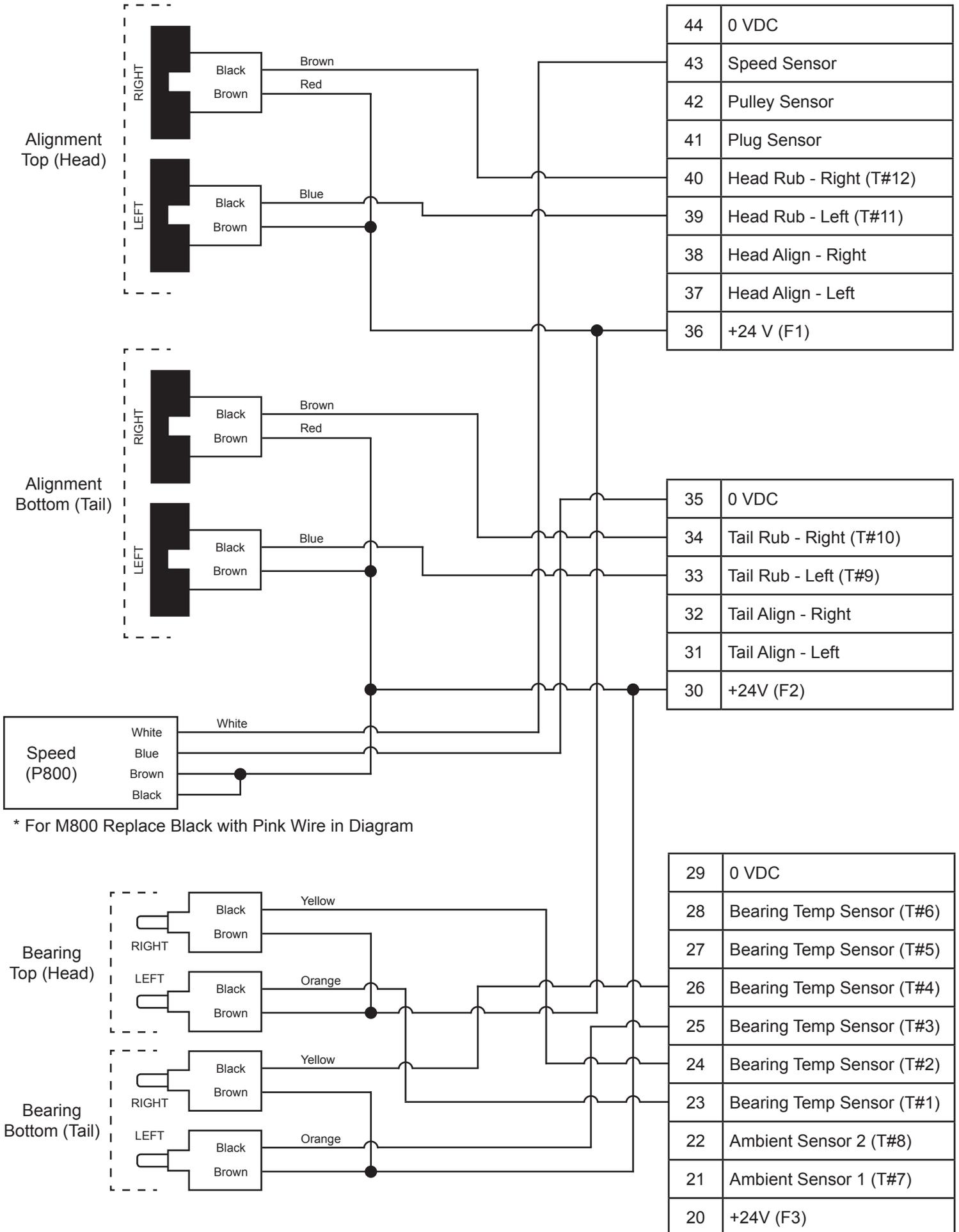
2. SENSOR WIRING DIAGRAM PROFILE WITH TOUCHSWITCHES -

MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE > LEG (TS)/ 1SP, 4BS, 4TS



3. SENSOR WIRING DIAGRAM PROFILE WITH RUB BLOCKS -

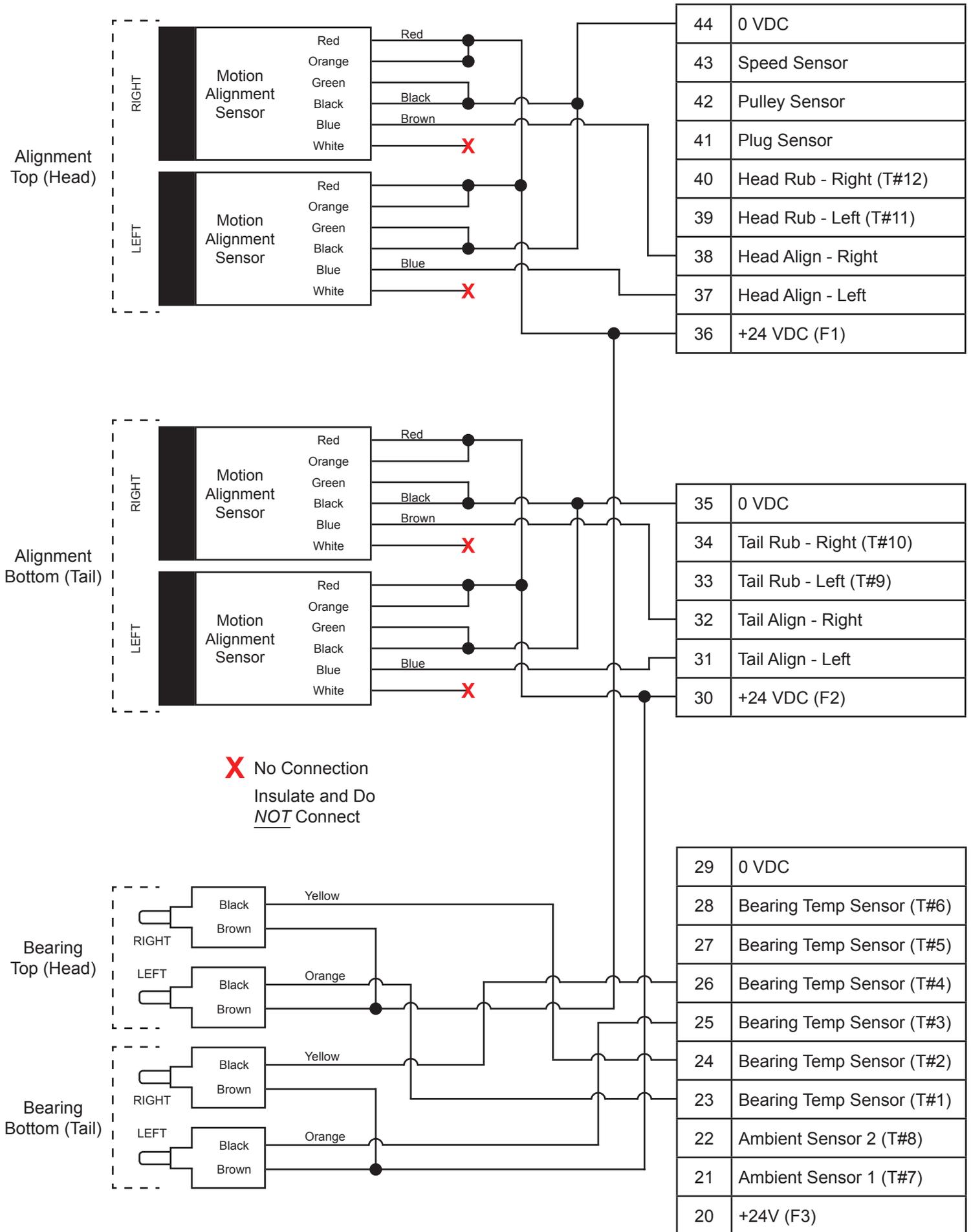
MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE > LEG (RB)/ 1SP, 4BS, 4RB



* For M800 Replace Black with Pink Wire in Diagram

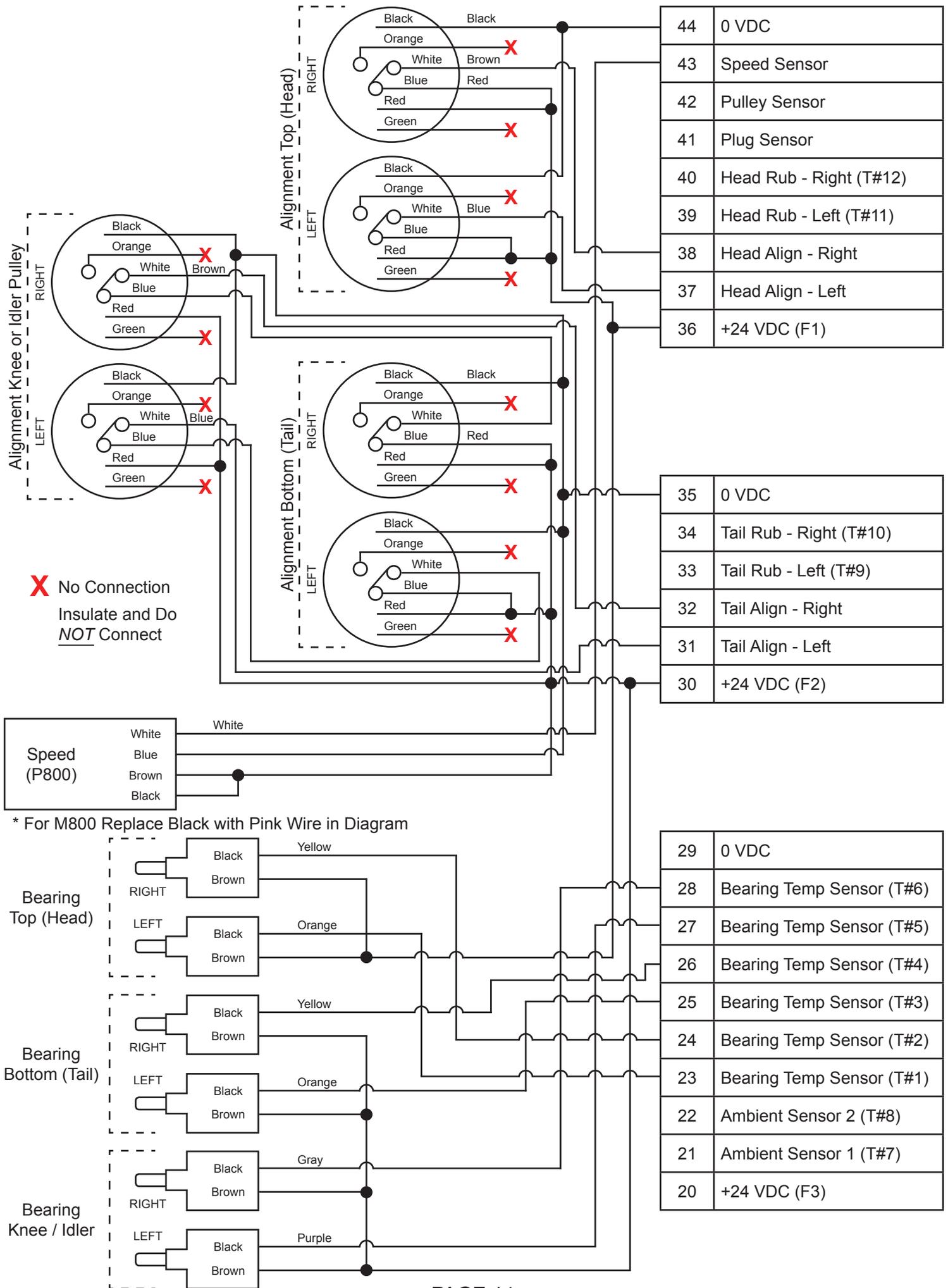
4. SENSOR WIRING DIAGRAM PROFILE WITH MOTION ALIGNMENT SENSORS -

MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE > LEG (WDA) 4MA, 4BS

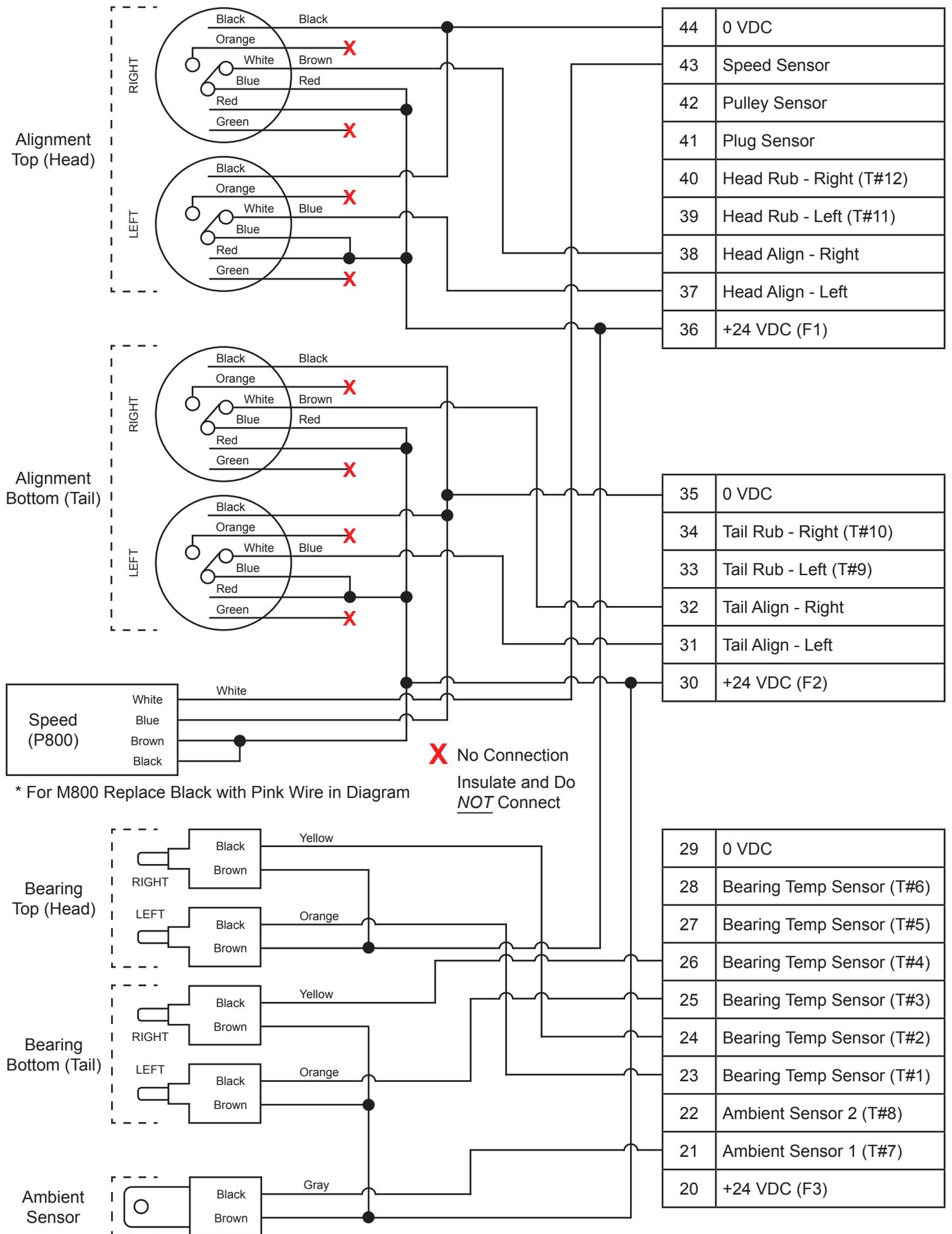


5. SENSOR WIRING DIAGRAM PROFILE WITH KNEE OR IDLER PULLEYS -

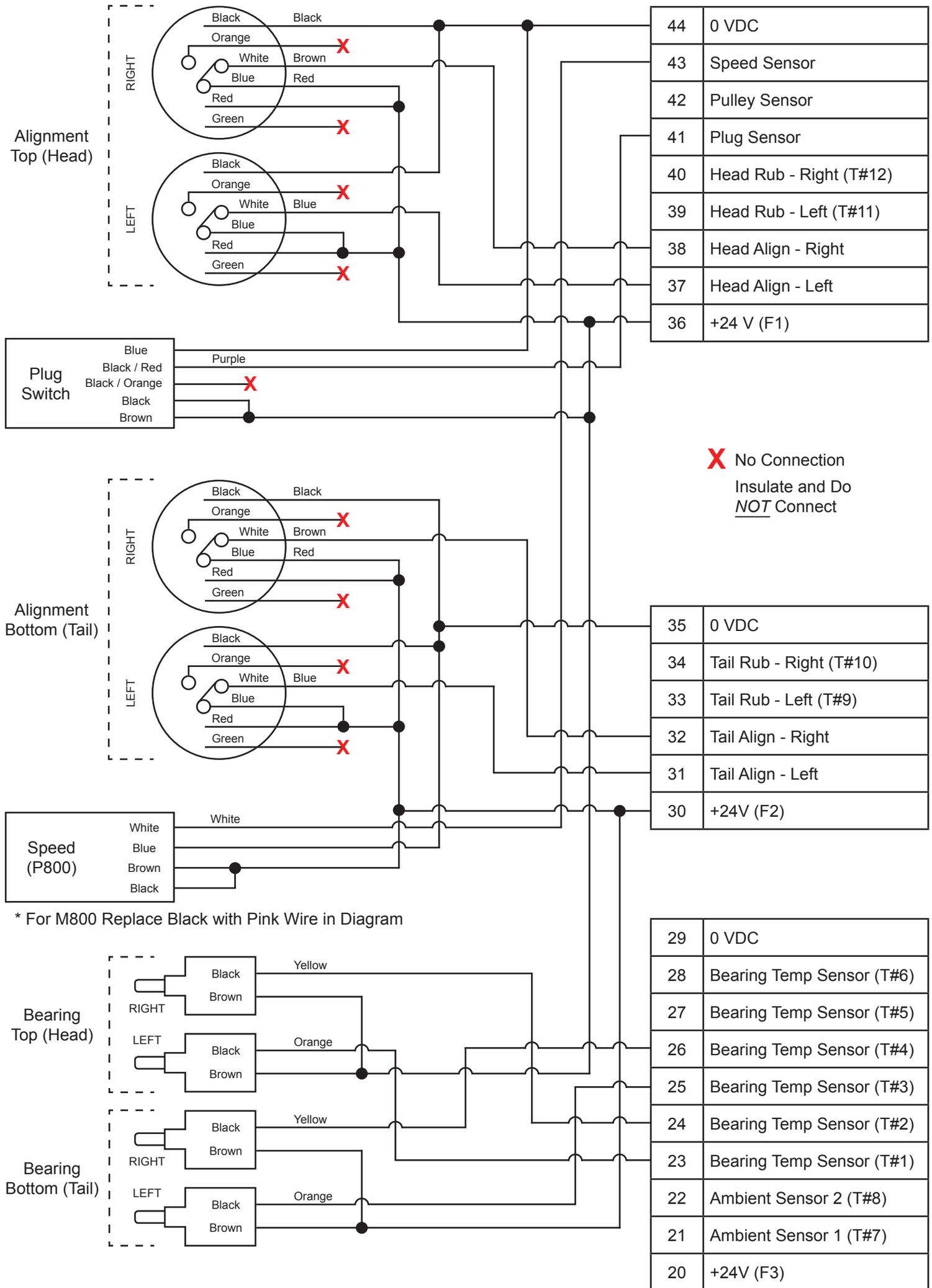
MENU > SETUP (PASSWORD) > PROFILE > SELECT NEW PROFILE > LEG (TS)/ 1SP, 6BS, 6TS



6. SENSOR WIRING DIAGRAM WITH AMBIENT SENSOR -

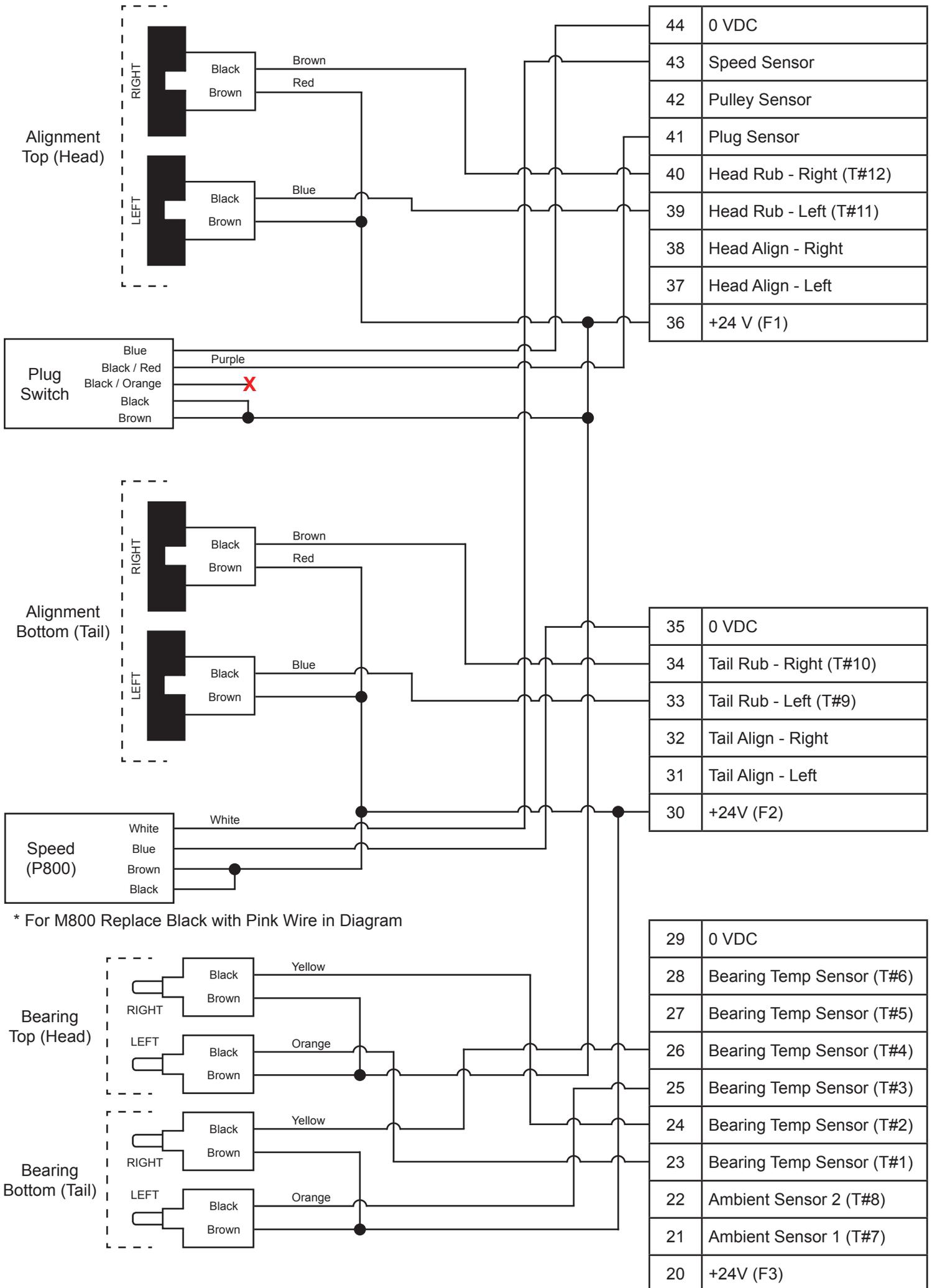


7. SENSOR WIRING DIAGRAM WITH TOUCHSWITCHES AND PLUG SWITCH -

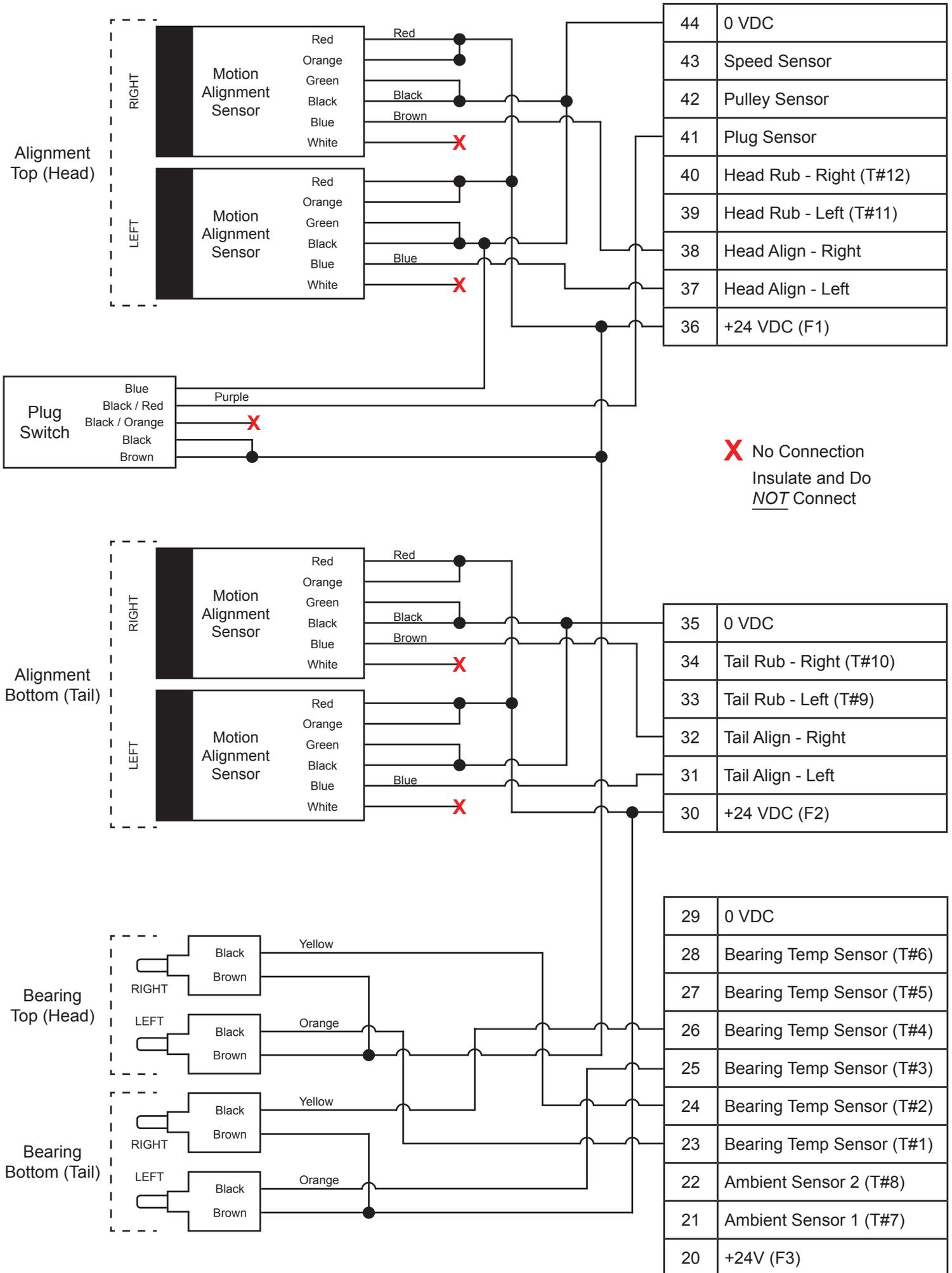


* For M800 Replace Black with Pink Wire in Diagram

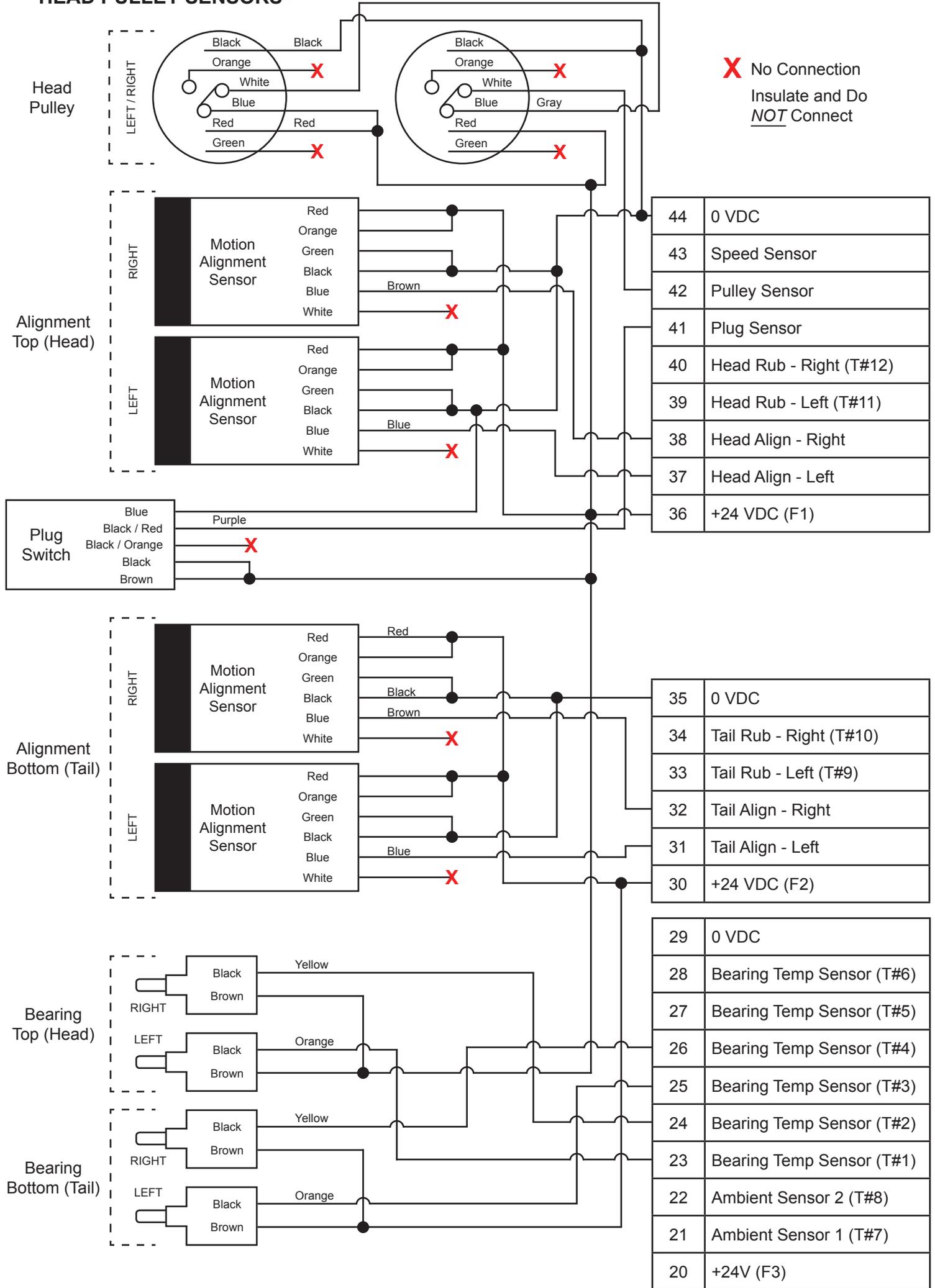
8. SENSOR WIRING DIAGRAM WITH RUB BLOCKS AND PLUG SWITCH -



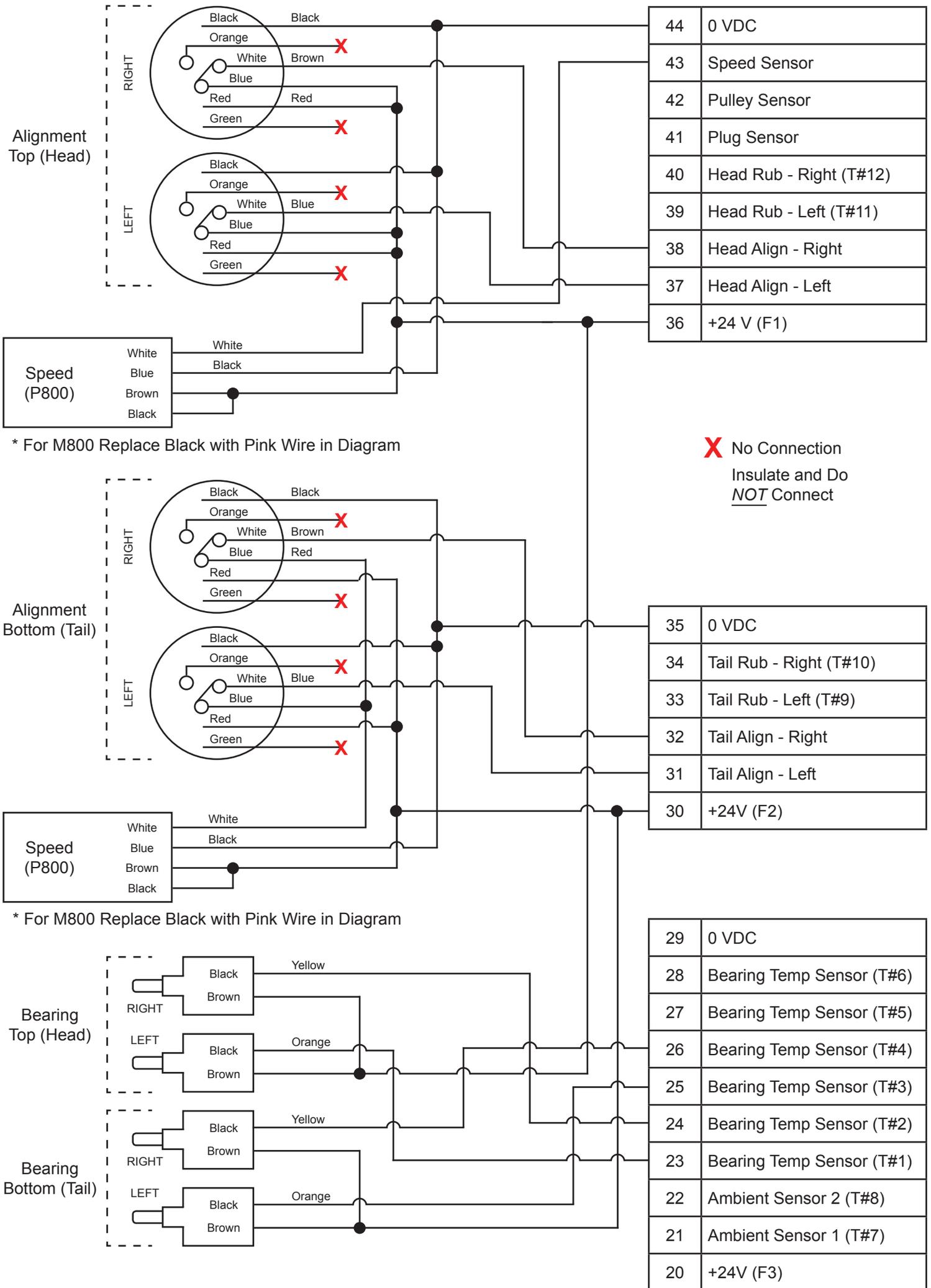
9. SENSOR WIRING DIAGRAM WITH MOTION ALIGNMENT SENSORS AND PLUG SWITCH -



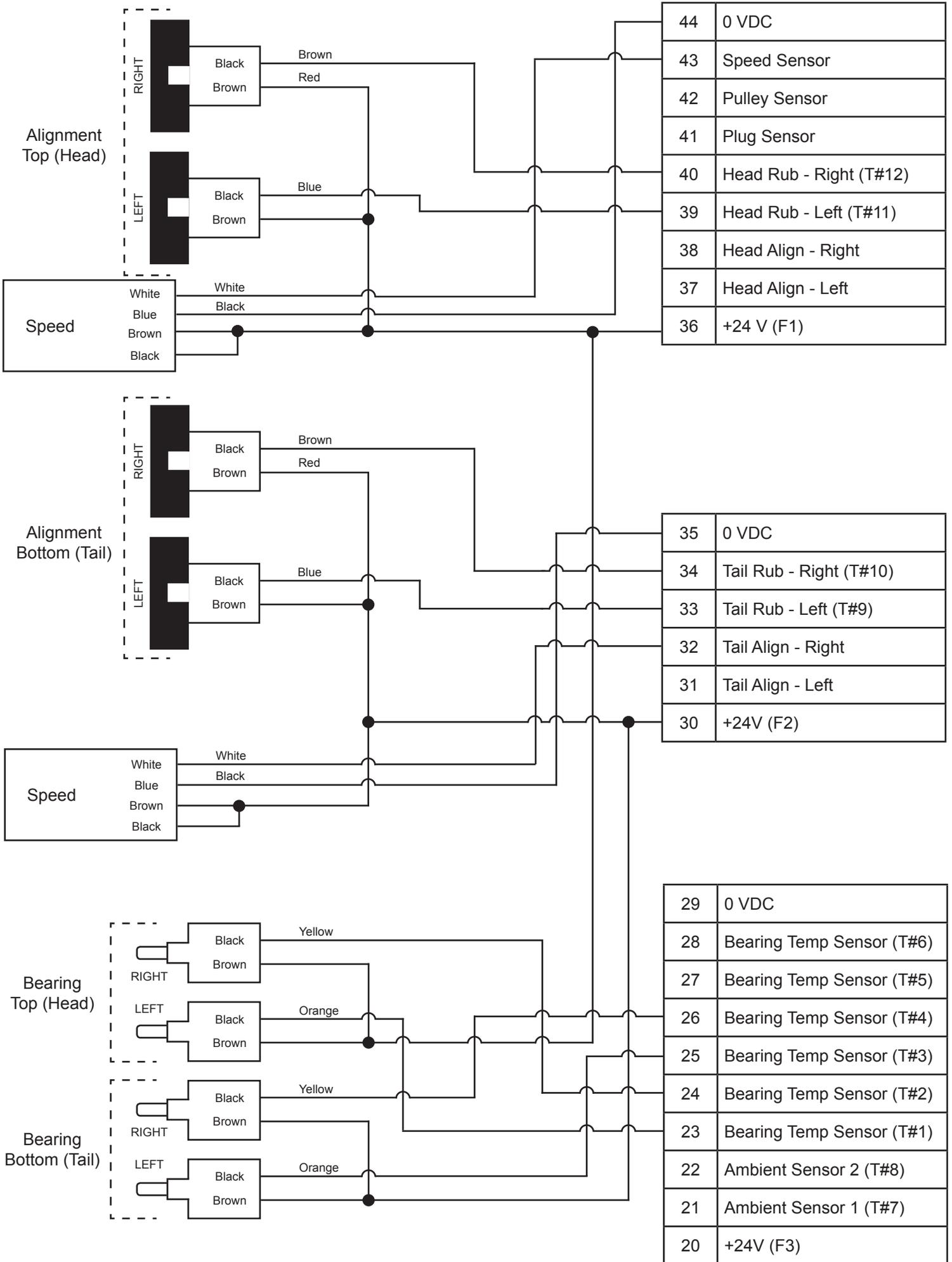
10. SENSOR WIRING DIAGRAM WITH MOTION ALIGNMENT SENSORS, PLUG SWITCH AND HEAD PULLEY SENSORS -



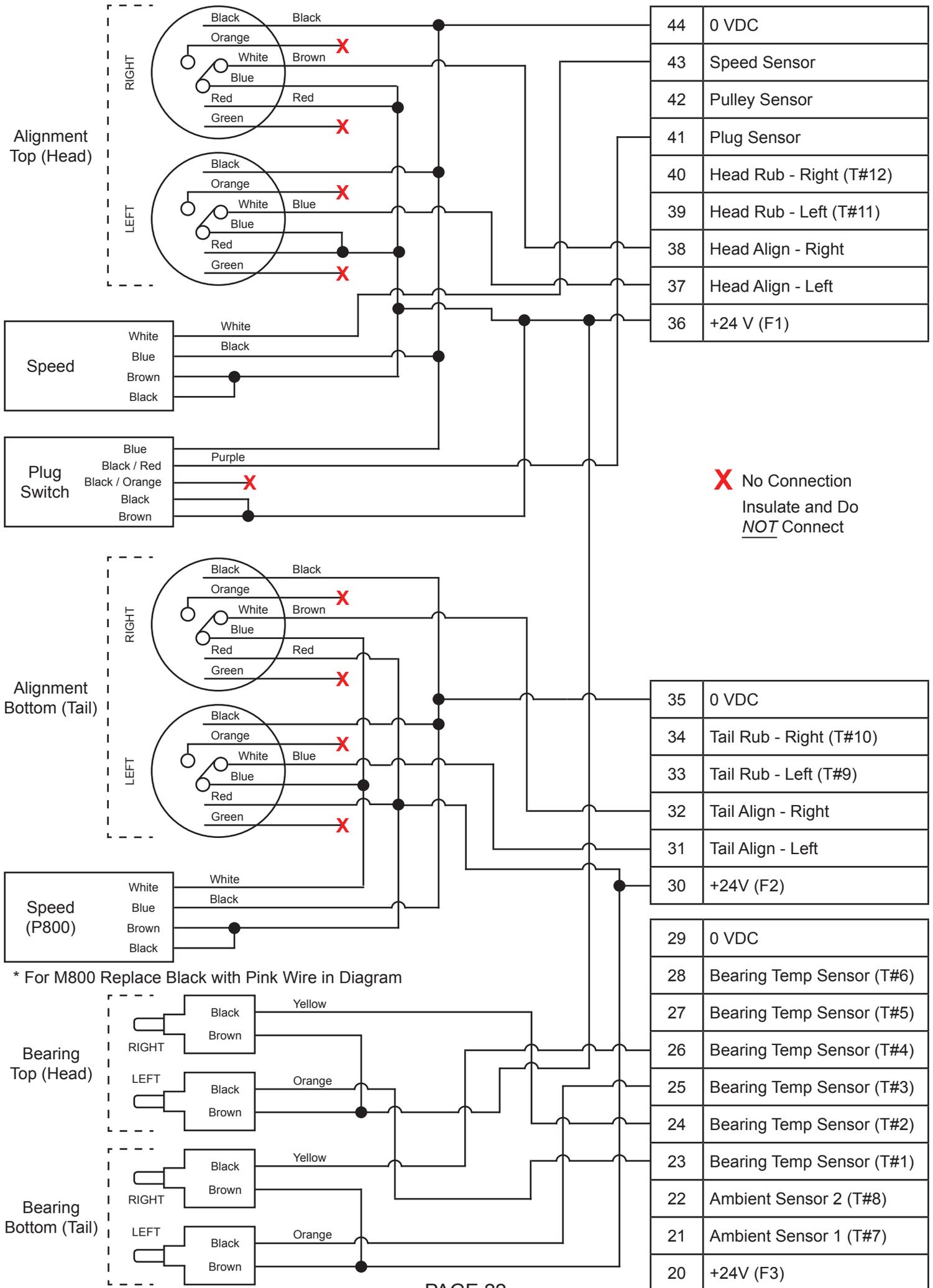
11. SENSOR WIRING DIAGRAM WITH TOUCHSWITCHES AND DIFFERENTIAL SPEED -



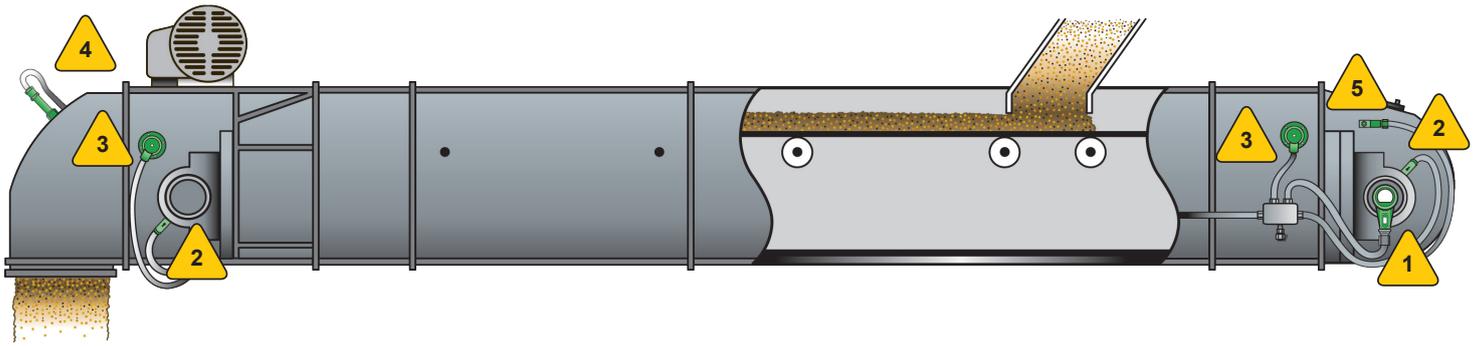
11A. SENSOR WIRING DIAGRAM PROFILE WITH RUB BLOCKS AND DIFFERENTIAL SPEED



12. SENSOR WIRING DIAGRAM WITH TOUCHSWITCHES, DIFFERENTIAL SPEED AND PLUG SWITCH -



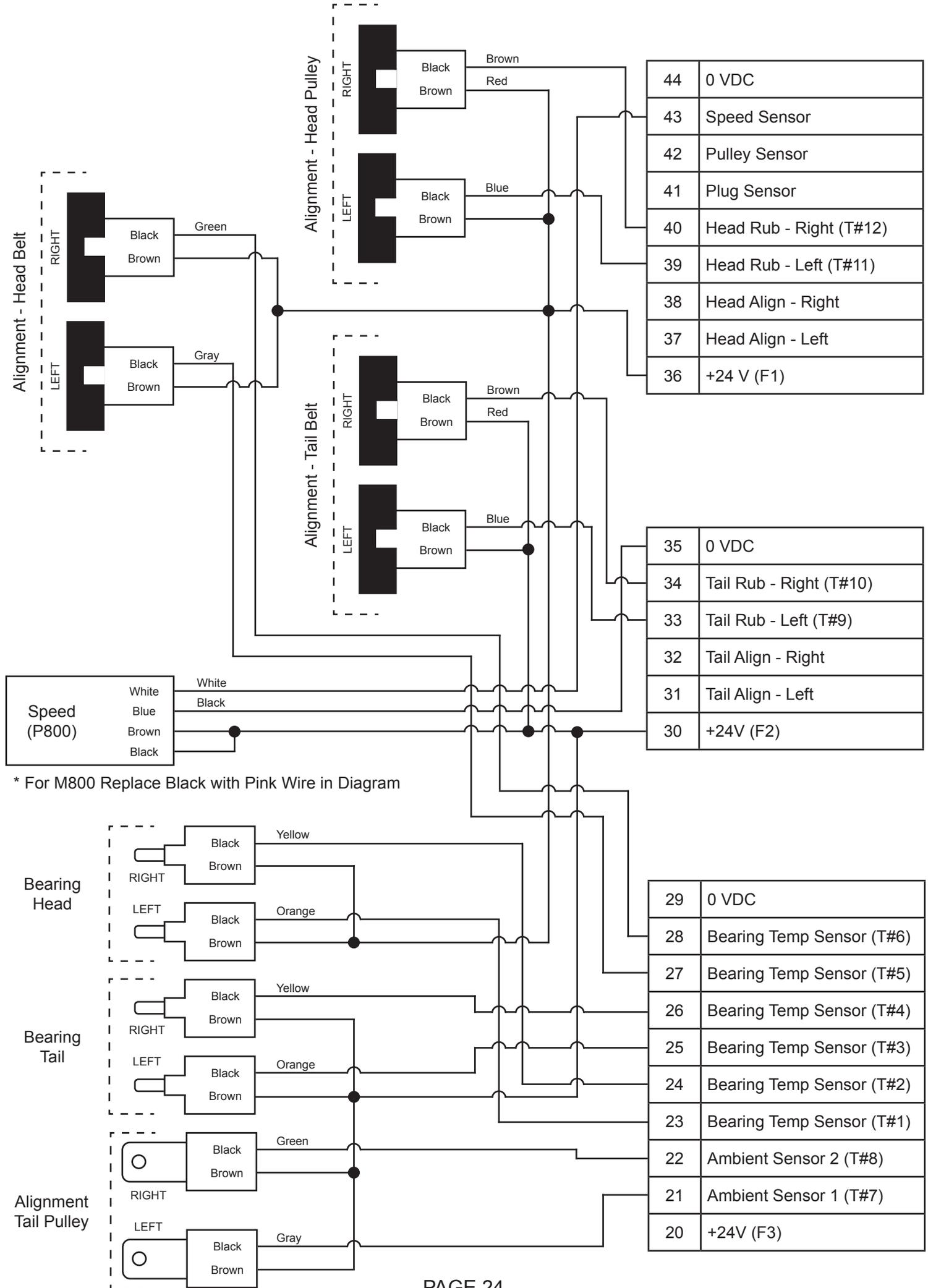
* For M800 Replace Black with Pink Wire in Diagram



TYPICAL SENSOR PLACEMENT FOR ENCLOSED BELT CONVEYORS

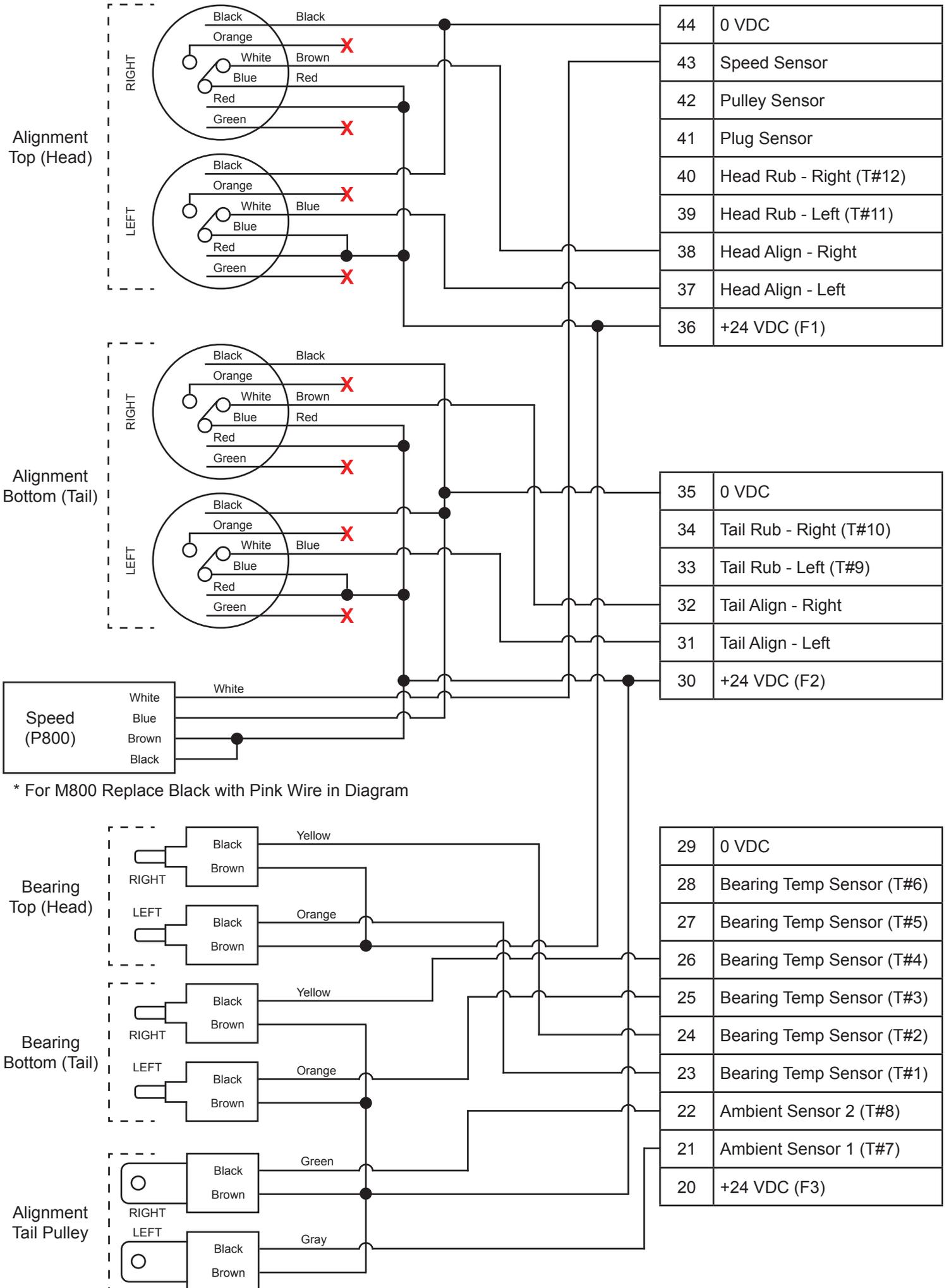
- 1** SPEED MONITORING
Qty. 1 - One sensor located on either side of the tail or boot shaft.
- 2** BEARING TEMPERATURE
Qty. 4 - One sensor for the bearings at each end of the drive and tail shafts.
- 3** BELT MISALIGNMENT
Qty. 4 - Sensors work in pairs, one for each side of the belt on the drive and tail sections.
- 4** PLUG INDICATION
Qty. 1 - One sensor located near the top of the drive section by the discharge.
- 5** TAIL PULLEY MISALIGNMENT
Qty. 2 - One sensor located on each side of the housing on the conveyor tail section.

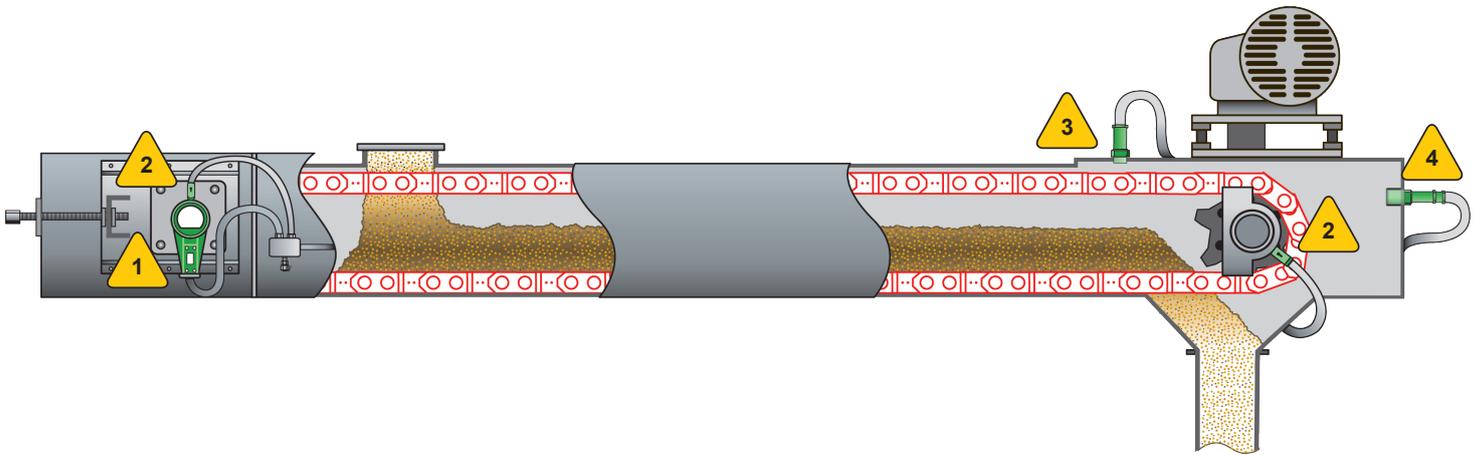
13. SENSOR WIRING DIAGRAM WITH 6 RUB BLOCKS, 4 BEARING TEMPERATURE SENSORS AND 2 LUG STYLE TAIL PULLEY ALIGNMENT SENSORS -



* For M800 Replace Black with Pink Wire in Diagram

14. SENSOR WIRING DIAGRAM WITH TOUCHSWITCHES, 4 BEARING TEMPERATURE SENSORS AND 2 LUG STYLE TAIL PULLEY ALIGNMENT SENSORS -

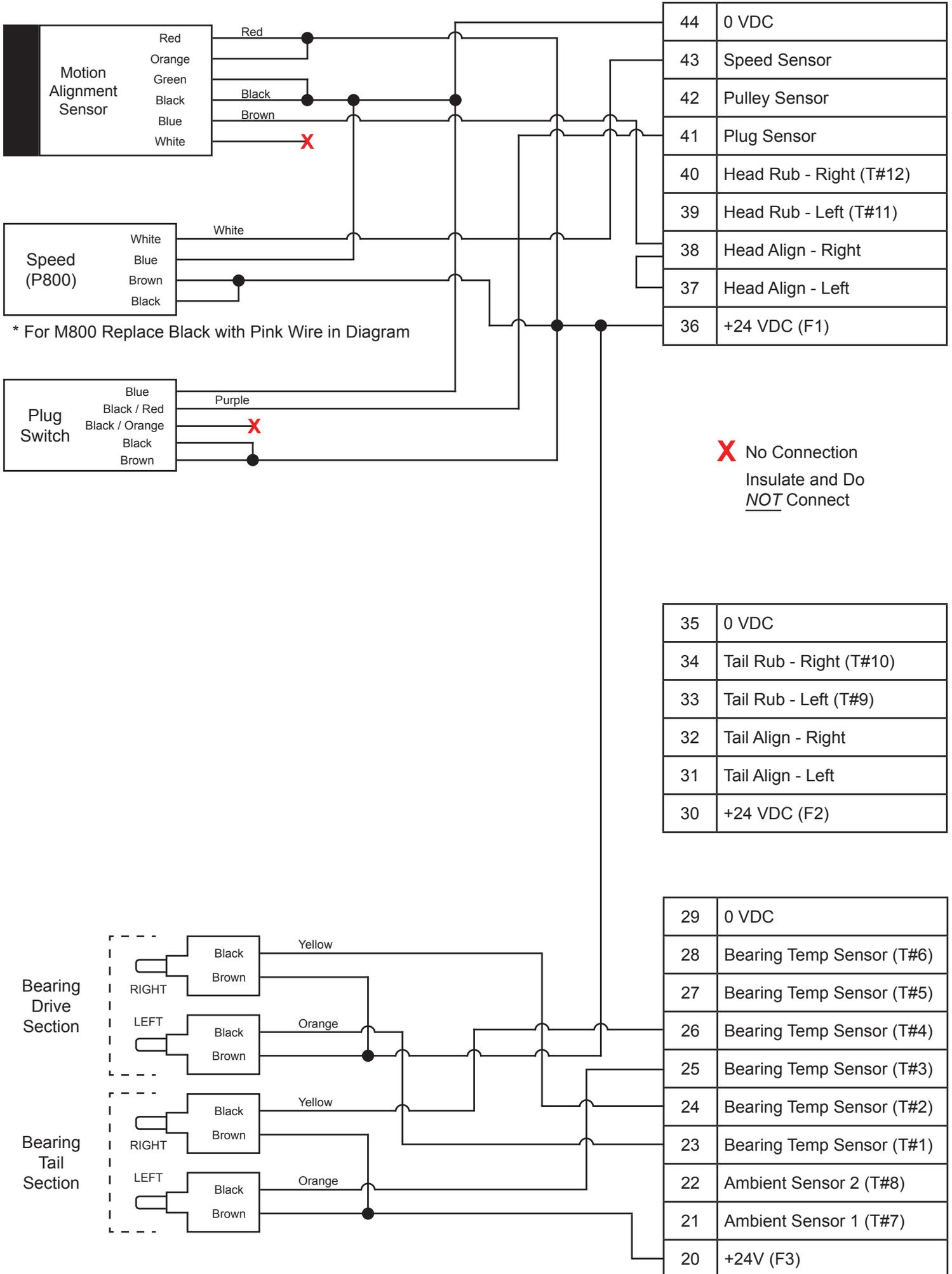




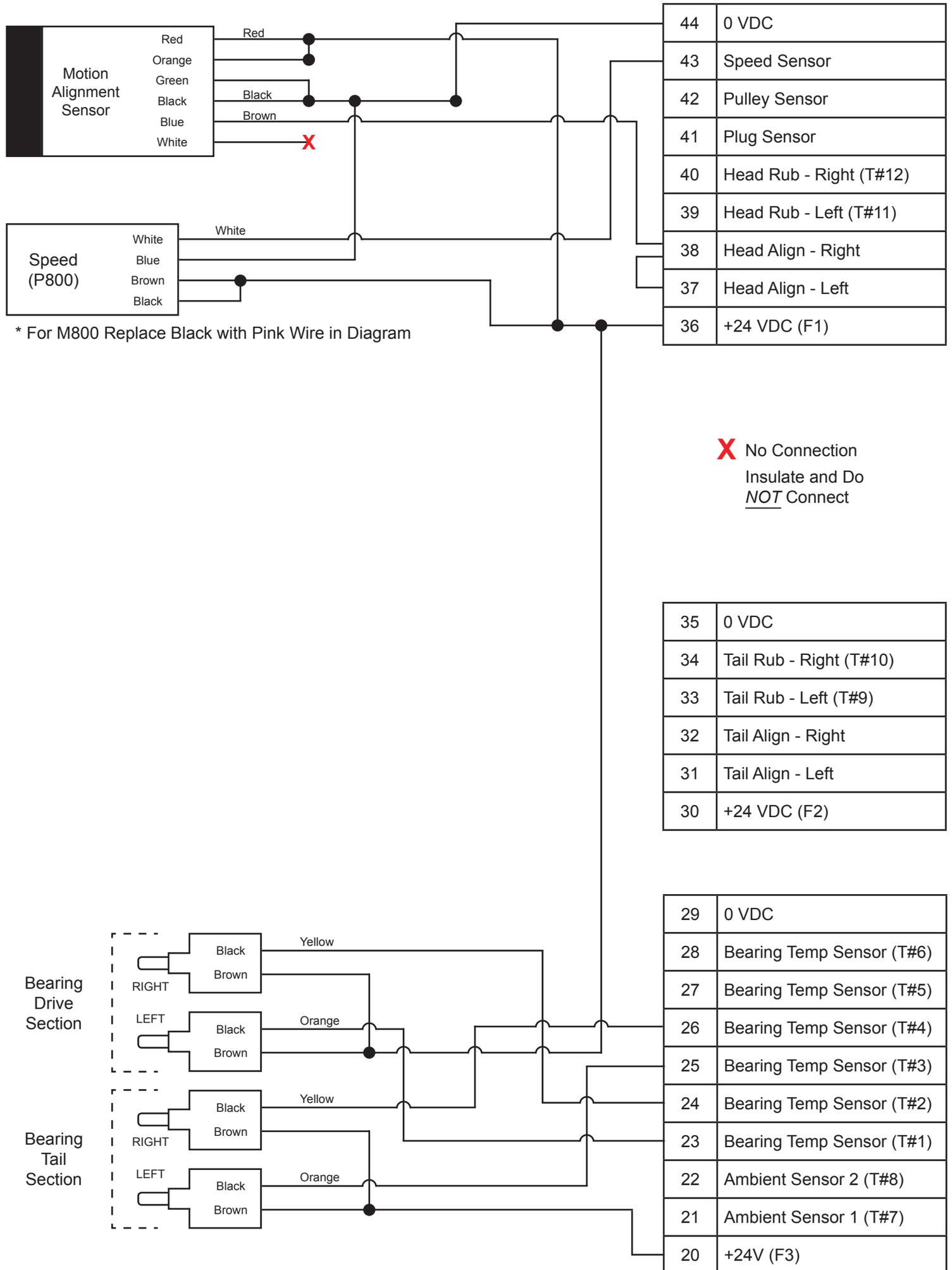
TYPICAL SENSOR PLACEMENT FOR DRAG CHAIN CONVEYORS

- 1** SPEED MONITORING
Qty 1 - One sensor located on either side of the tail or boot shaft.
- 2** BEARING TEMPERATURE
Qty. 4 - One sensor for the bearings at each end of the drive and tail shafts.
- 3** SLACK CHAIN DETECTION
Qty. 1 - One motion alignment sensor near the drive end.
- 4** PLUG INDICATION
Qty. 1 - One sensor located near the top of the drive section by the discharge.

15. SENSOR WIRING DIAGRAM FOR SLACK CHAIN DETECTION WITH PLUG SWITCH -



16. SENSOR WIRING DIAGRAM FOR SLACK CHAIN DETECTION WITHOUT PLUG SWITCH -



PRODUCT WARRANTY

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ALL PRODUCTS SOLD ARE WARRANTED BY THE COMPANY 4B COMPONENTS LIMITED AND 4B BRAIME COMPONENTS LIMITED HEREIN AFTER REFERRED TO AS 4B TO THE ORIGINAL PURCHASER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE (1) YEAR AFTER DATE OF PURCHASE FROM 4B. ANY PRODUCT DETERMINED BY 4B AT ITS SOLE DISCRETION TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO A 4B BRANCH OR AUTHORIZED SERVICE LOCATION, AS 4B DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT 4B'S OPTION.

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