

SkillsUSA 2015 Contest Projects

Industrial Motor Control

Click the “Print this Section” button above to automatically print the specifications for this contest. Make sure your printer is turned on before pressing the button.

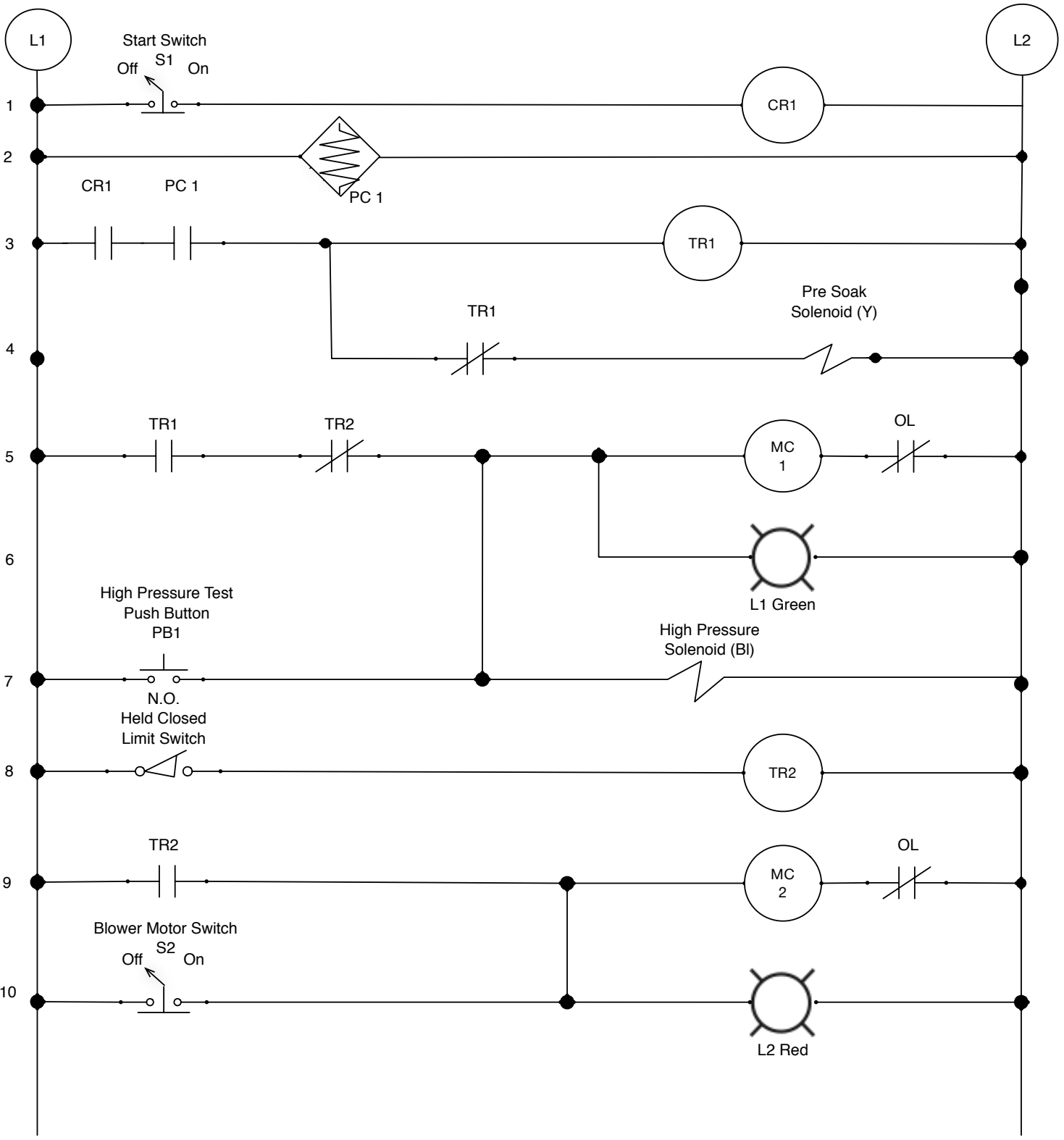
Skills 2014 Inventory
Industrial Motor Control

Qty	Description	Box
50	Motor Starter Enclosed (CHECN0511AAA) Empty	2
46	Limit Switch CH E50SB 4 Pole	2
10	lb drywall screws	2
1000	10 x 3/4" screws	2
1000	8 x 1 1/2" screws	2
300	Red Marrette Wirenuts	2
400	Yellow Marrette Wirenuts	2
300	Ground Screws	2
100	1/2 Heavy Wall one hole straps	2
100	3/8 one Hole Straps	2
150	Romex 3/8" connectors	2
30	MC 3/8 connectors	2
3	TRL27 Timers	2
100	Terminal Strip Connectors Gray	2
50	End Terminal Caps	2
6	Electric Meters DVM	2
48	E50SA Limit Sw	2
41	Roto Zips	2
42	4-hole Enclosures	2
96	3-Position Selector Switches NO/NO Hold/Off/Hold	2
34	Power Cords 120 volts	2
49	Photo Cells 1351E-6514 Eaton	2
48	Blue Indicator Lights, 120 volts.	2
48	Amber Indicator Lights 120 volts	2
87	Green Indicator Lights	2
46	Black Pushbuttons NO./NC	2
44	Red Indicator Lights	2
4	Step sttols	2
1	4-foot ladder	2
3	Power Strips	2
2	Conduit Jigs	2
100	Din Rail	2
28	Rolls Black Tape	2
		2
		2
		2

Skills 2013 Inventory

Industrial Motor Control

Qty	Description	Box		
31	Eaton Overload Relay Bases C306GN3B	6	*	
750'	16/8 MC (Red)	6	*	
500'	14 /3 MC cable	6	*	
100'	1/2 Metal Flex	6	*	
4750	#14 AWG Red	6		
3000'	#14 Blue	6		
4750	#14 AWG Black	6		
1750	#14 AWG White	6		
2250	#14 AWG Green	6		
75'	1/2 Liquidtight conduit	6		
59	Eaton TOP Mount Aux C320KGT15	6		
95	Red Push to test Buttons 120 V	6		
49	Green Push to Test Buttons 120 v	6		
45	Limit Switches E5SA NO/NC	6		
50	eaton Aux Sidemount Contacts C32KGS1	6		
144	Red Pushbotton NO/NC	6		
24	Eaton Aux Contact C320KGS1	6		
25	Power Cords 120 Volts	6		
7	Green Push Buttons NO/NC	6		
26	Armor Cable Splitters	6		
34	Selector Switches NO/NO Nomentary/Off/Hold	6		
4200	Yellow Ideal Wirenuts	6		
3600	Red Ideal Wirenuts	6		
26	D2PR4A Relays 120 v	6		
53	D2PA6 Relay Bases	6		
5	3/4 - 1/2 inch Reducing Bushings	6		
5	1 - 1/2 inch reducing Bushings	6		
600	Red Marrette Wire Connectors	6		
580	Yellow Marrette Wire Connectors	6		
1000	Green Ground Screws	6		
1100	Ideal Power Tie Cabkle Ties	6		
95	Black Pushbuttons NO/NC	6		
50	White ID Tape	6		
49	Blue ID Tape	6		
24	T&B Metal 1/2" Flex Connector	6		
32	D2PA4 Base Black.	6		
10	Benders	6		



2015 Skills USA Industrial Motor Control Car Wash Project

The wash tub manager has hired you to wire the control system for a new carwash facility.

Conditions:

When a selector switch is activated, it shall send a signal to start the prewired conveyor belt to pull the car forward. After the car reaches a certain distance, a photocell shall be activated to start the presoak solenoid. After five seconds, a timing relay will activate high pressure solenoid and *motor #1*. Once the car reaches a certain point, *motor #1* and high pressure solenoid shuts off, and *motor #2* activates for drying the car.

Customer Requirements: (work description)

Operation of Car Wash

- When selector switch #1 is turned on, control relay engages.
- Control relay activates photocell and timing relay #1.
- With photocell activated by a car, presoak solenoid and timing relay #1 engage.
- After *five* seconds timing relay #1 stops presoak while activating *motor #1* and high pressure solenoid.
- A green indicator light comes on when *motor #1* is running.
- When car is on limit switch plate, it activates timing relay #2 for *ten* seconds.
- Blower *motor #2* engages for as long as the car is on the pressure plate.
- A red indicator light comes on when *motor #2* (Blower) is running.
- A *BLACK button* will be added to test *motor #1* and high pressure solenoid when wash is not in normal operation.
- A selector switch is needed to test *motor #2* (Blower) when car wash is not in normal operation.

Work Sheet

Contestant Number _____

Page No. _____

Date: _____

Customer Name: 2015 Skills USA Industrial motor control
Competition

Work Station _____

Address:

Phone: None

Work Description: _____

Quantity	Item Description	Unit Cost	Total Cost	
	Total Additional Materials from Attached Pages			
	Total Materials			

Arrived on Job Site:	Departed Job Site:
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Labor to be billed	Name	Hours (Regular)	Hours (Overtime)

I hereby acknowledge satisfactory completion of work as described.

Work approved by: _____ **Date:** _____

Continuation Sheet

Page ____ of ____

Job Number _____

Quantity	Item Description	Unit Cost	Total Cost	
	Total This Page			

SPECIFICATIONS: Car Wash Project

1. The work area consists of a 4' x 6' 1/2 sheet of plywood.
2. All vertical measurements specified as AFF (Above Finished Floor) will be from the concrete floor. Horizontal measurements will be from the specified exposed edge of the sheet of plywood.
3. All work will be done using the 2014 NEC.
4. Installation must utilize minimum materials while still meeting all requirements.
5. All box and device mounting dimensions will be to the center of the box or device unless otherwise specified.
6. Power cord must be installed on the top side of control box utilizing a 1/2 knock out and must be secured with a 1/2" romex connector.
7. Selector switch # 1 will be mounted on the right side of the control box, utilizing the first Knockout from the top.
8. Selector switch #2 will be mounted on the right side of the control box, utilizing the second knockout from the the top.
9. The momentary push button switch will be mounted on the right side of the control box, centered, utilize the third hole from the top.
10. An enclosure with a four hole indicator light cover will be vertically mounted 12" from the right side of the control box and 70" centered AFF.
11. 1/2" liquid flexible conduit will be used to feed control wiring to the bottom of the four hole indicator light enclosure. (Not the side of the enclosure) On the right side of the control box, a round knockout will be utilized for the flex.
12. An amber indicator light will be used in the first hole, **furthest to the raceway entry point**, of the four hole enclosure in place of the presoak solenoid.
13. A green indicator light will be used when motor #1 is activated in the second hole of the four hole enclosure.
14. A blue indicator light will be used in the third hole of the four hole enclosure in place of the high pressure solenoid.
15. A red indicator light will be used when motor #2 is activated in the fourth hole, **closest to the raceway entry point**, of the four hole enclosure.
16. Photocell enclosure will be mounted vertically 6" center from the right side of the control box and 55" center AFF. (The reflector plate will be used by the Judges)

SKILLS USA 2015

17. SO cable will be used to feed control wiring to the photocell enclosure. A 1/2" knockout will be utilized from the bottom of control box.
18. A limit switch will be mounted 24" AFF and 30" from the right side of the wall.
19. 1/2 liquid flexible nonmetallic tubing (LNFC) will be used to connect the limit switches to the control enclosure.
20. Motor #1 will be mounted 24" AFF and 40" from the right side of the wall and center of the mounting base. A keyless light fixture and lamp will be used to represent motor #1.
21. 14-3 - 3/8 MC Cable will be used to connect Motor #1.
22. Motor #2 will be mounted 18" AFF and 36" from the right side of the wall. A keyless light fixture and lamp will be used to represent motor #2.
23. 14-3- 3/8 MC cable will be used to connect Motor #2
24. The job is not complete until the Job Work Sheet is filled out.

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Industrial Motor Control

Conduit Bending: [Download the Publisher files](#)

2015
Industrial Motor Control

Oral Professional Assessment

Secondary _____

Post-Secondary _____

Contestant Number _____

Judges' Oral Professional Assessment Score Sheet
2015 SkillsUSA Industrial Motor Control Competition

Contestant Number _____

The undersigned affirms that the following topics were discussed during the verbal interview process.

In the electrical field:

Reason(s) for interest

Education

Training

Experience

Educational plans:

Knowledge / interest in apprenticeship

Technical / vocational plan(s)

Possible collegiate interests

Training & Skills Assessment

Important skills acquired to date

Important skills / knowledge learned exclusively in SkillsUSA

Suggested improvements to training received to date

Further areas would like to investigate

Career Goals (10 years from now)

Working in what field

Located in what area of the country

Job title / description

Judge's Notes:

Points Awarded (Maximum of 60) _____

Judge Name (printed): _____ **Judge Number:** _____

Judge Signature: _____

Judges' Secondary Interview Score Sheet

2015 SkillsUSA Industrial Motor Control Competition

Contestant Number _____

The undersigned affirms that the following topics were discussed during the verbal interview process.

In the electrical field:

Reason(s) for interest
Education
Training
Experience

Educational plans:

Knowledge / interest in apprenticeship
Technical / vocational plan(s)
Possible collegiate interests

Training & Skills Assessment

Important skills acquired to date
Important skills / knowledge learned exclusively in SkillsUSA
Suggested improvements to training received to date
Further areas would like to investigate

Career Goals (10 years from now)

Working in what field
Located in what area of the country
Job title / description

Judge's Notes:

Points Awarded (Maximum of 60) _____

Judge Name (printed): _____ Judge Number: _____

Judge Signature: _____

06-15-2015

Judges' Post-Secondary Interview Score Sheet

2015 SkillsUSA Industrial Motor Control Competition

Contestant Number _____

The undersigned affirms that the following topics were discussed during the verbal interview process.

In the electrical field:

Reason(s) for interest
Education
Training
Experience

Educational plans:

Knowledge / interest in apprenticeship
Technical / vocational plan(s)
Possible collegiate interests

Training & Skills Assessment

Important skills acquired to date
Important skills / knowledge learned exclusively in SkillsUSA
Suggested improvements to training received to date
Further areas would like to investigate

Career Goals (10 years from now)

Working in what field
Located in what area of the country
Job title / description

Judge's Notes:

Points Awarded (Maximum of 60) _____

Judge Name (printed): _____ **Judge Number:** _____

Judge Signature: _____

06-15-2015