









































- Car ground -> Black
- 12V Sensor -> Red
- Normal Signal -> White
- ECU 5V -> Orange
- ECU GND -> Grey
- ECU Signal -> White
- Crank/CAN -> 22 Twisted 2
- Ethernet -> 22 Twisted 4

					Name	Date		
				Drawn By	Brent	Jan 13		
				Eng Approved		----		
Title		Part Number		Q20 Harness		Mfg Approved	----	This document contains confidential and proprietary information that cannot be reproduced or divulged, in whole or in part, without written authorization.
Description		Car Harness Design for QFSAE Q20 Car		Revision		----	QA	






































Title:	QFSAE Q20 Final Harness Design
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

From	To	Conductor	Conductor PN	Twisted With	Gauge	Length	From Contact PN	Notes
AFR.2	ECU_D.22	W10.White	22 AWG White		22 AWG	≥ 12 in		AV8, AFR Signal
AFR.3	GND	W12.Black	20 AWG Black		20 AWG	≥ 12 in		Car GND -> AFR
BSPD.1	TPS1	W123.White	22 AWG White		22 AWG	≥ 7 in		BSPD TPS1 Splice
BSPD.3	BSE1	W125.White	22 AWG White		22 AWG	≥ 7 in		BSE1
BSPD.4	BSE2	W126.White	22 AWG White		22 AWG	≥ 7 in		BSE2
BSPD.5	PCB_12V	W127.Red	20 AWG Red		20 AWG	≥ 7 in		BSPD 12V
BSPD.6	GND	W128.Black	20 AWG Black		20 AWG	≥ 6 in		BSPD Ground
BSPD.7	PDM_A.A30	W49.White	22 AWG White		22 AWG	≥ 10 in		BSPD Flag Input
Battery.1	GND	W129.Black	M22759/8-8-0		8 AWG	≥ 15 in		Battery Ground
BrakeLight.1	BrakePressureSwitch.2	W40.Red	20 AWG Red		20 AWG	≥ 18 in		
BrakeLight.2	GND	W71.Black	20 AWG Black		20 AWG	≥ 6 in		Brake Light GND
BrakeOT.1	DashMasterSwitch.1	W41.Red	20 AWG Red		20 AWG	≥ 54 in		Dash -> Brake OT
CAN_COMM	COMM.9	COMM_CAN.Black	2 Wire 22 AWG shielded		22 AWG	≥ 1 in		Comm CAN Lo
CAN_COMM	COMM.10	COMM_CAN.Brown	2 Wire 22 AWG shielded		22 AWG	≥ 1 in		Comm CAN Hi
CAN_PDM	CAN_COMM	CAN3.Black	2 Wire 22 AWG shielded		22 AWG	≥ 2 in		
CAN_PDM	CAN_COMM	CAN3.Brown	2 Wire 22 AWG shielded		22 AWG	≥ 2 in		
CAN_PDM	PDM_B.B25	PDM_CAN.Black	2 Wire 22 AWG shielded twisted	Brown	22 AWG	≥ 5 in		
CAN_PDM	PDM_B.B26	PDM_CAN.Brown	2 Wire 22 AWG shielded twisted	Black	22 AWG	≥ 5 in		
DashMasterSwitch.2	PDM_A.A27	W9.White	20 AWG White		20 AWG	≥ 45 in		Master Switch Input
Datalogger.8	PDM_A.A06	W30.Red	20 AWG Red		20 AWG	≥ 14 in		Datalogger Pwr
Datalogger.15	GPS.3	W62.White	22 AWG White		22 AWG	≥ 10 in		GPS RX
Datalogger.16	GPS.2	W61.White	22 AWG White		22 AWG	≥ 10 in		GPS TX
Datalogger.19	FL_Damper.2	W14.White	22 AWG White		22 AWG	≥ 51 in		FL Damper
Datalogger.20	FR_Damper.2	W15.White	22 AWG White		22 AWG	≥ 51 in		FR Damper
Datalogger.21	SteeringAngle.2	W16.White	22 AWG White		22 AWG	≥ 45 in		Steering Potentiometer
Datalogger.22	FrontBrakePres.2	W19.White	22 AWG White		22 AWG	≥ 45 in		
Datalogger.27	GPS.1	W63.Black	20 AWG Black		20 AWG	≥ 10 in		GPS GND
Datalogger.28	GPS.4	W64.Red	20 AWG Red		20 AWG	≥ 10 in		GPS 5V
Datalogger.34	OilTemp.2	W45.White	22 AWG White		22 AWG	≥ 22 in		Oil Temp
Datalogger.45	RL_Damper.2	W21.White	22 AWG White		22 AWG	≥ 16 in		RL Damper
Datalogger.46	RR_Damper.2	W22.White	22 AWG White		22 AWG	≥ 16 in		RR Damper
Datalogger.47	RearBrakePres.2	W23.White	22 AWG White		22 AWG	≥ 45 in		Rear Brake Pressure
Datalogger.67	COMM.1	L180_Comm.Orange	4 Wire 22 AWG shielded		22 AWG	≥ 10 in		Ethernet Transmit +
Datalogger.68	COMM.2	L180_Comm.Brown	4 Wire 22 AWG shielded		22 AWG	≥ 10 in		Ethernet Transmit -
Datalogger.77	COMM.3	L180_Comm.Red	4 Wire 22 AWG shielded		22 AWG	≥ 10 in		Ethernet Receive +
Datalogger.78	COMM.4	L180_Comm.Black	4 Wire 22 AWG shielded		22 AWG	≥ 10 in		Ethernet Receive -
ECU_A.3	APPS1.2	W110.White	22 AWG White		22 AWG	≥ 20 in		APPS1
ECU_A.5	APPS2.2	W18.White	22 AWG White		22 AWG	≥ 18 in		APPS2 Signal
ECU_A.10	5V_C	W84.Orange	22 AWG Orange		22 AWG			ECU->5V Splice C
ECU_A.15	FL_Speed.2	W44.White	22 AWG White		22 AWG	≥ 34 in		FL Speed Signal
ECU_A.16	RR_Speed.2	W59.White	22 AWG White		22 AWG			RL Speed Signal










































Title:	QFSAE Q20 Final Harness Design
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

From	To	Conductor	Conductor PN	Twisted With	Gauge	Length	From Contact PN	Notes
ECU_A.17	RL_Speed.2	 W13.White	24 AWG White		24 AWG			RL Speed Input Signal
ECU_A.18	5V_C							
ECU_A.23	FR_Speed.2	 W43.White	22 AWG White		22 AWG	≥ 6 in		FR Speed Signal
ECU_A.24	GND	 W38.Black	20 AWG Black		20 AWG			ECU BATT -
ECU_A.25	GND	 W53.Black	20 AWG Black		20 AWG			ECU BATT -
ECU_A.26	0V_C	 W87.Orange	22 AWG Orange		22 AWG			ECU -> 0V C
ECU_A.27	0V_C	 W88.Orange	22 AWG Orange		22 AWG			
ECU_A.32	GND	 W54.Black	20 AWG Black		20 AWG			ECU BATT -
ECU_B.13	ECU_PWR	 W2.Red	20 AWG Red		20 AWG			ECU 12V
ECU_B.19	ECU_PWR	 W4.Red	20 AWG Red		20 AWG			ECU 12V
ECU_C.1	ETB_PWR.2	 W104.Red	20 AWG Red		20 AWG	≥ 6 in		Motor +
ECU_C.3	Coil.2	 W47.White	22 AWG White		22 AWG			Coil Signal
ECU_C.4	TPS2	 W150.White	22 AWG White		22 AWG			TPS2
ECU_C.10	GND	 W33.Black	20 AWG Black		20 AWG			ECU BATT -
ECU_C.11	GND	 W34.Black	20 AWG Black		20 AWG			ECU Batt -
ECU_C.14	ThrottlePosition.2	 W114.White	22 AWG White		22 AWG	≥ 6 in		TPS2
ECU_C.15	MATP.3	 W52.White	22 AWG White		22 AWG	≥ 18 in		MAP Signal
ECU_C.16	GearPosition.2	 W130.White	22 AWG White		22 AWG	≥ 12 in		Gear Pos Signal
ECU_C.17	OilPressure.2	 W149.White	22 AWG White		22 AWG			AV4, Oil Pressure
ECU_C.18	ETB_PWR.1	 W102.Black	20 AWG Black		20 AWG	≥ 6 in		Motor -
ECU_C.19	Injector.2	 W75.Black	20 AWG Black		20 AWG	≥ 10 in		Injector Signal
ECU_C.20	Shifting.2	 W103.Black	20 AWG Black		20 AWG			Upshift Actuator
ECU_C.21	Shifting.3	 W111.Black	20 AWG Black		20 AWG			Downshift Actuator
ECU_C.25	FuelPres.2	 W50.White	22 AWG White		22 AWG			Fuel Pressure
ECU_C.26	ECU_PWR	 W5.Red	20 AWG Red		20 AWG			ECU 12V
ECU_D.1	CamCrank.1	 CRANK.Brown	2 Wire (1 twisted pair), 24 AWG Shielded	Black	24 AWG			Crank Signal
ECU_D.3	MATP.2	 W25.White	22 AWG White		22 AWG	≥ 18 in		MAT Sensor
ECU_D.4	CoolantTemp.2	 W24.White	22 AWG White		22 AWG			Coolant Temp Signal
ECU_D.15	CamCrank.2	 CRANK.Black	2 Wire (1 twisted pair), 24 AWG Shielded	Brown	24 AWG			Crank Ground, Sensor 0V A
ECU_D.16	ThrottlePosition.3					≥ 6 in		TPS 0V B
ECU_D.20	TPS1	 W57.White	22 AWG White		22 AWG			TPS1
ECU_D.21	SteeringWheel.1	 W51.White	22 AWG White		22 AWG	≥ 26 in		Rotary Switch 1, Fuel Map Toggle
ECU_D.23	COMM.5	 ECU_Comm.Black	4 Wire 24 AWG shielded		24 AWG			
ECU_D.24	COMM.6	 ECU_Comm.Brown	4 Wire 24 AWG shielded		24 AWG			
ECU_D.25	COMM.7	 ECU_Comm.Red	4 Wire 24 AWG shielded		24 AWG			
ECU_D.26	COMM.8	 ECU_Comm.Orange	4 Wire 24 AWG shielded		24 AWG			
FL_Speed.1	GND	 W70.Black	20 AWG Black		20 AWG	≥ 34 in		FL Speed GND
FL_Speed.3	12V_Sensors	 W99.Red	20 AWG Red		20 AWG	≥ 34 in		12V Sensor Supply
FR_Speed.1	GND	 W69.Black	20 AWG Black		20 AWG	≥ 6 in		FR Speed GND
FR_Speed.3	12V_Sensors	 W100.Red	20 AWG Red		20 AWG	≥ 6 in		
FanSwitch.1	PDM_A.A28	 W1.Black	20 AWG Black		20 AWG	≥ 36 in		Fan GND










































Title:	QFSAE Q20 Final Harness Design
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

From	To	Conductor	Conductor PN	Twisted With	Gauge	Length	From Contact PN	Notes
FanSwitch.2	PDM_AA29	 W35.White	20 AWG White		20 AWG	≥ 36 in		Fan Input
FuelPump.3	GND	 W97.Black	20 AWG Black		20 AWG	≥ 6 in		Fuel Pump GND
GND	Fan_R.2	 W68.Black	20 AWG Black		20 AWG	≥ 6 in		Right Fan Ground
GearPosition.1	0V_C	 W90.Brown	22 AWG Brown		22 AWG	≥ 12 in		Gear Position GND C
GearPosition.3	5V_C	 W89.Orange	22 AWG Orange		22 AWG	≥ 12 in		Gear Position 5V C
MATP.1	0V_C	 W91.Brown	22 AWG Brown		22 AWG	≥ 18 in		MATP 0V C
MATP.4	5V_C	 W92.Brown	22 AWG Brown		22 AWG	≥ 18 in		MATP 5V C
MasterSwitch.1	Battery.1	 W65.Black	M22759/8-8-0		8 AWG	35 in		
OilPressure.1	0V_C	 W93.Brown	22 AWG Brown		22 AWG			Oil Pressure 0V C
OilPressure.3	5V_C	 W151.Orange	22 AWG Orange		22 AWG			Oil Pressure 5V C
OilTemp.1	0V_C	 W133.Brown	22 AWG Brown		22 AWG	≥ 12 in		Oil Temp 0V C
OilTemp.3	5V_C	 W132.Orange	22 AWG Orange		22 AWG	≥ 12 in		Oil Temp 5V C
PDM_AA02	Transponder.1	 W27.Red	20 AWG Red		20 AWG	≥ 23 in		Transponder
PDM_AA03	FAN_L.1	 W148.Red	20 AWG Red		20 AWG	≥ 20 in		Left Fan 12V
PDM_AA04	Dash_MCU.1	 W3.Red	20 AWG Red		20 AWG	≥ 45 in		Dash Power
PDM_AA07	AFR.1	 W31.Red	20 AWG Red		20 AWG	≥ 16 in		AFR PWR
PDM_AA09	ECU_PWR	 W26.Red	22 AWG Red		22 AWG			PDM -> ECU 12V Splice
PDM_AA10	BrakePressureSwitch.1	 W6.Red	20 AWG Red		20 AWG	≥ 16 in		PDM->Brake Switch
PDM_AA11	Coil.1	 W7.Red	20 AWG Red		20 AWG	≥ 4 in		Coil Circuit
PDM_AA13	Injector.1	 W8.Red	20 AWG Red		20 AWG	≥ 14 in		Injector
PDM_AA15	BrakeOT.2	 W42.Red	20 AWG Red		20 AWG	≥ 47 in		Master Switch Out
PDM_AA17	ECU_PWR	 W32.Red	20 AWG Red		20 AWG			PDM -> ECU 12V
PDM_B.B03	FuelPump.1	 W36.Red	20 AWG Red		20 AWG	≥ 10 in		Fuel Pump PWR
PDM_B.B05	Fan_R.1	 W147.Red	20 AWG Red		20 AWG	≥ 10 in		
PDM_B.B07	Shifting.1	 W11.Red	20 AWG Red		20 AWG	≥ 4 in		Shifting 12V
PDM_C	MasterSwitch.2	 W56.Red	M22759/87-8-2		8 AWG	≥ 24 in		
PDM_C	StarterRelay.1	 W145.Red	M22759/8-8-2		8 AWG	12 in		PDM -> Starter Relay
RL_Damper.1	GND	 W72.Black	20 AWG Black		20 AWG	≥ 6 in		
RL_Damper.3	12V_Sensors	 W121.Red	20 AWG Red		20 AWG	≥ 6 in		
RL_Speed.1	GND	 W20.Black	22 AWG Black		22 AWG			RL Speed GND
RL_Speed.3	12V_Sensors	 W101.Red	20 AWG Red		20 AWG			
RR_Damper.1	GND	 W122.Black	20 AWG Black		20 AWG	≥ 6 in		
RR_Damper.3	12V_Sensors	 W135.Red	20 AWG Red		20 AWG	≥ 6 in		
RR_Speed.1	GND	 W67.Black	20 AWG Black		20 AWG			RR Speed GND
RR_Speed.3	12V_Sensors	 W112.Red	20 AWG Red		20 AWG			12V Sensor Supply
Starter	StarterRelay.2	 W146.Red	M22759/8-8-2		8 AWG	≥ 2.67 ft		Starter Relay -> Starter
ThrottlePosition.1	TPS1	 W136.White	22 AWG White		22 AWG	≥ 7 in		ETB TPS1










































Title:	----
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

#	Type	Reference Designator	Manufacturer	Part Number	Color	Gauge	Length	Twisted With
1	Cable	CAN1		2 Wire 22 AWG shielded	 White		0 in	
2	Cable	CAN2		2 Wire 22 AWG shielded	 White		0 in	
3	Cable	CAN3		2 Wire 22 AWG shielded	 White		≥ 2 in	
4	Cable	COMM_CAN		2 Wire 22 AWG shielded	 White		≥ 1 in	
5	Cable	CRANK		2 Wire (1 twisted pair), 24 AWG Shielded	 White			
6	Cable	ECU_Comm		4 Wire 24 AWG shielded	 White			
7	Cable	L180_Comm		4 Wire 22 AWG shielded	 White		≥ 10 in	
8	Cable	MCU_CAN		2 Wire 22 AWG shielded	 White		0 in	
9	Cable	PDM_CAN		2 Wire 22 AWG shielded twisted	 White		≥ 5 in	
10	Wire	W1		20 AWG Black	 Black	20 AWG	≥ 36 in	
11	Wire	W2		20 AWG Red	 Red	20 AWG		
12	Wire	W3		20 AWG Red	 Red	20 AWG	≥ 45 in	
13	Wire	W4		20 AWG Red	 Red	20 AWG		
14	Wire	W5		20 AWG Red	 Red	20 AWG		
15	Wire	W6		20 AWG Red	 Red	20 AWG	≥ 16 in	
16	Wire	W7		20 AWG Red	 Red	20 AWG	≥ 4 in	
17	Wire	W8		20 AWG Red	 Red	20 AWG	≥ 14 in	
18	Wire	W9		20 AWG White	 White	20 AWG	≥ 45 in	
19	Wire	W10		22 AWG White	 White	22 AWG	≥ 12 in	
20	Wire	W11		20 AWG Red	 Red	20 AWG	≥ 4 in	
21	Wire	W12		20 AWG Black	 Black	20 AWG	≥ 12 in	
22	Wire	W13		24 AWG White	 White	24 AWG		
23	Wire	W14		22 AWG White	 White	22 AWG	≥ 51 in	
24	Wire	W15		22 AWG White	 White	22 AWG	≥ 51 in	
25	Wire	W16		22 AWG White	 White	22 AWG	≥ 45 in	
26	Wire	W17		22 AWG White	 White	22 AWG	0 in	
27	Wire	W18		22 AWG White	 White	22 AWG	≥ 18 in	
28	Wire	W19		22 AWG White	 White	22 AWG	≥ 45 in	
29	Wire	W20		22 AWG Black	 Black	22 AWG		
30	Wire	W21		22 AWG White	 White	22 AWG	≥ 16 in	
31	Wire	W22		22 AWG White	 White	22 AWG	≥ 16 in	
32	Wire	W23		22 AWG White	 White	22 AWG	≥ 45 in	
33	Wire	W24		22 AWG White	 White	22 AWG		
34	Wire	W25		22 AWG White	 White	22 AWG	≥ 18 in	
35	Wire	W26		22 AWG Red	 Red	22 AWG		
36	Wire	W27		20 AWG Red	 Red	20 AWG	≥ 23 in	
37	Wire	W28		22 AWG White	 White	22 AWG	0 in	
38	Wire	W29		22 AWG White	 White	22 AWG	0 in	
39	Wire	W30		20 AWG Red	 Red	20 AWG	≥ 14 in	
40	Wire	W31		20 AWG Red	 Red	20 AWG	≥ 16 in	
41	Wire	W32		20 AWG Red	 Red	20 AWG		






































Title:	----
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

#	Type	Reference Designator	Manufacturer	Part Number	Color	Gauge	Length	Twisted With
42	Wire	W33		20 AWG Black	 Black	20 AWG		
43	Wire	W34		20 AWG Black	 Black	20 AWG		
44	Wire	W35		20 AWG White	 White	20 AWG	≥ 36 in	
45	Wire	W36		20 AWG Red	 Red	20 AWG	≥ 10 in	
46	Wire	W37		20 AWG Red	 Red	20 AWG	0 in	
47	Wire	W38		20 AWG Black	 Black	20 AWG		
48	Wire	W39		22 AWG White	 White	22 AWG	0 in	
49	Wire	W40		20 AWG Red	 Red	20 AWG	≥ 18 in	
50	Wire	W41		20 AWG Red	 Red	20 AWG	≥ 54 in	
51	Wire	W42		20 AWG Red	 Red	20 AWG	≥ 47 in	
52	Wire	W43		22 AWG White	 White	22 AWG	≥ 6 in	
53	Wire	W44		22 AWG White	 White	22 AWG	≥ 34 in	
54	Wire	W45		22 AWG White	 White	22 AWG	≥ 22 in	
55	Wire	W46		22 AWG White	 White	22 AWG	0 in	
56	Wire	W47		22 AWG White	 White	22 AWG		
57	Wire	W48		22 AWG White	 White	22 AWG	0 in	
58	Wire	W49		22 AWG White	 White	22 AWG	≥ 10 in	
59	Wire	W50		22 AWG White	 White	22 AWG		
60	Wire	W51		22 AWG White	 White	22 AWG	≥ 26 in	
61	Wire	W52		22 AWG White	 White	22 AWG	≥ 18 in	
62	Wire	W53		20 AWG Black	 Black	20 AWG		
63	Wire	W54		20 AWG Black	 Black	20 AWG		
64	Wire	W55		22 AWG White	 White	22 AWG	0 in	
65	Wire	W56		M22759/87-8-2	 Red	8 AWG	≥ 24 in	
66	Wire	W57		22 AWG White	 White	22 AWG		
67	Wire	W58		22 AWG White	 White	22 AWG	0 in	
68	Wire	W59		22 AWG White	 White	22 AWG		
69	Wire	W60		22 AWG White	 White	22 AWG	0 in	
70	Wire	W61		22 AWG White	 White	22 AWG	≥ 10 in	
71	Wire	W62		22 AWG White	 White	22 AWG	≥ 10 in	
72	Wire	W63		20 AWG Black	 Black	20 AWG	≥ 10 in	
73	Wire	W64		20 AWG Red	 Red	20 AWG	≥ 10 in	
74	Wire	W65		M22759/8-8-0	 Black	8 AWG	35 in	
75	Wire	W66		20 AWG Red	 Red	20 AWG	0 in	
76	Wire	W67		20 AWG Black	 Black	20 AWG		
77	Wire	W68		20 AWG Black	 Black	20 AWG	≥ 6 in	
78	Wire	W69		20 AWG Black	 Black	20 AWG	≥ 6 in	
79	Wire	W70		20 AWG Black	 Black	20 AWG	≥ 34 in	
80	Wire	W71		20 AWG Black	 Black	20 AWG	≥ 6 in	
81	Wire	W72		20 AWG Black	 Black	20 AWG	≥ 6 in	
82	Wire	W73		20 AWG Black	 Black	20 AWG	0 in	

Title:	----
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

#	Type	Reference Designator	Manufacturer	Part Number	Color	Gauge	Length	Twisted With
83	Wire	W74		20 AWG Black	 Black	20 AWG	0 in	
84	Wire	W75		20 AWG Black	 Black	20 AWG	≥ 10 in	
85	Wire	W76		20 AWG Black	 Black	20 AWG	0 in	
86	Wire	W77		20 AWG Black	 Black	20 AWG	0 in	
87	Wire	W78		20 AWG Black	 Black	20 AWG	0 in	
88	Wire	W79		20 AWG Black	 Black	20 AWG	0 in	
89	Wire	W80		20 AWG Black	 Black	20 AWG	0 in	
90	Wire	W81		20 AWG Black	 Black	20 AWG	0 in	
91	Wire	W82		20 AWG Black	 Black	20 AWG	0 in	
92	Wire	W83		22 AWG Orange	 Orange	22 AWG	0 in	
93	Wire	W84		22 AWG Orange	 Orange	22 AWG		
94	Wire	W85		22 AWG Orange	 Orange	22 AWG	0 in	
95	Wire	W86		22 AWG Orange	 Orange	22 AWG	0 in	
96	Wire	W87		22 AWG Orange	 Orange	22 AWG		
97	Wire	W88		22 AWG Orange	 Orange	22 AWG		
98	Wire	W89		22 AWG Orange	 Orange	22 AWG	≥ 12 in	
99	Wire	W90		22 AWG Brown	 Brown	22 AWG	≥ 12 in	
100	Wire	W91		22 AWG Brown	 Brown	22 AWG	≥ 18 in	
101	Wire	W92		22 AWG Brown	 Brown	22 AWG	≥ 18 in	
102	Wire	W93		22 AWG Brown	 Brown	22 AWG		
103	Wire	W94		22 AWG Brown	 Brown	22 AWG	0 in	
104	Wire	W95		22 AWG Brown	 Brown	22 AWG	0 in	
105	Wire	W96		22 AWG Brown	 Brown	22 AWG	0 in	
106	Wire	W97		20 AWG Black	 Black	20 AWG	≥ 6 in	
107	Wire	W98		22 AWG White	 White	22 AWG	0 in	
108	Wire	W99		20 AWG Red	 Red	20 AWG	≥ 34 in	
109	Wire	W100		20 AWG Red	 Red	20 AWG	≥ 6 in	
110	Wire	W101		20 AWG Red	 Red	20 AWG		
111	Wire	W102		20 AWG Black	 Black	20 AWG	≥ 6 in	
112	Wire	W103		20 AWG Black	 Black	20 AWG		
113	Wire	W104		20 AWG Red	 Red	20 AWG	≥ 6 in	
114	Wire	W105		22 AWG White	 White	22 AWG	0 in	
115	Wire	W106		22 AWG White	 White	22 AWG	0 in	
116	Wire	W107		22 AWG White	 White	22 AWG	0 in	
117	Wire	W108		22 AWG White	 White	22 AWG	0 in	
118	Wire	W109		22 AWG White	 White	22 AWG	0 in	
119	Wire	W110		22 AWG White	 White	22 AWG	≥ 20 in	
120	Wire	W111		20 AWG Black	 Black	20 AWG		
121	Wire	W112		20 AWG Red	 Red	20 AWG		
122	Wire	W113		22 AWG White	 White	22 AWG	0 in	
123	Wire	W114		22 AWG White	 White	22 AWG	≥ 6 in	

Title:	----
Part Number:	Q20 Harness
Description:	Car Harness Design for QFSAE Q20 Car

#	Type	Reference Designator	Manufacturer	Part Number	Color	Gauge	Length	Twisted With
124	Wire	W115		22 AWG White	 White	22 AWG	0 in	
125	Wire	W116		22 AWG White	 White	22 AWG	0 in	
126	Wire	W117		22 AWG White	 White	22 AWG	0 in	
127	Wire	W118		22 AWG White	 White	22 AWG	0 in	
128	Wire	W119		22 AWG White	 White	22 AWG	0 in	
129	Wire	W120		22 AWG White	 White	22 AWG	0 in	
130	Wire	W121		20 AWG Red	 Red	20 AWG	≥ 6 in	
131	Wire	W122		20 AWG Black	 Black	20 AWG	≥ 6 in	
132	Wire	W123		22 AWG White	 White	22 AWG	≥ 7 in	
133	Wire	W124		22 AWG White	 White	22 AWG	0 in	
134	Wire	W125		22 AWG White	 White	22 AWG	≥ 7 in	
135	Wire	W126		22 AWG White	 White	22 AWG	≥ 7 in	
136	Wire	W127		20 AWG Red	 Red	20 AWG	≥ 7 in	
137	Wire	W128		20 AWG Black	 Black	20 AWG	≥ 6 in	
138	Wire	W129		M22759/8-8-0	 Black	8 AWG	≥ 15 in	
139	Wire	W130		22 AWG White	 White	22 AWG	≥ 12 in	
140	Wire	W131		22 AWG Brown	 Brown	22 AWG	0 in	
141	Wire	W132		22 AWG Orange	 Orange	22 AWG	≥ 12 in	
142	Wire	W133		22 AWG Brown	 Brown	22 AWG	≥ 12 in	
143	Wire	W134		20 AWG Black	 Black	20 AWG	0 in	
144	Wire	W135		20 AWG Red	 Red	20 AWG	≥ 6 in	
145	Wire	W136		22 AWG White	 White	22 AWG	≥ 7 in	
146	Wire	W137		20 AWG Red	 Red	20 AWG	0 in	
147	Wire	W138		20 AWG Red	 Red	20 AWG	0 in	
148	Wire	W139		20 AWG Red	 Red	20 AWG	0 in	
149	Wire	W140		20 AWG Red	 Red	20 AWG	0 in	
150	Wire	W141		20 AWG Red	 Red	20 AWG	0 in	
151	Wire	W142		20 AWG Red	 Red	20 AWG	0 in	
152	Wire	W143		20 AWG Red	 Red	20 AWG	0 in	
153	Wire	W144		20 AWG Red	 Red	20 AWG	0 in	
154	Wire	W145		M22759/8-8-2	 Red	8 AWG	12 in	
155	Wire	W146		M22759/8-8-2	 Red	8 AWG	≥ 2.67 ft	
156	Wire	W147		20 AWG Red	 Red	20 AWG	≥ 10 in	
157	Wire	W148		20 AWG Red	 Red	20 AWG	≥ 20 in	
158	Wire	W149		22 AWG White	 White	22 AWG		
159	Wire	W150		22 AWG White	 White	22 AWG		
160	Wire	W151		22 AWG Orange	 Orange	22 AWG		
161		ECU_A.18 - 5V_C						
162		ECU_D.16 - ThrottlePosition.3					≥ 6 in	