FRC 2855
Parts Manual

Version 1.3

Max Narvaez

Categories

BE **Bearing**

B/C **Belt/Chain Part**

C **Cable/Wire**

CS **Control System**

E **Electrical**

F/C **Fastening/Connecting**

GB **Gearbox/GB Part**

ME **Metal Part**

M **Motor**

MC **Motor Controller**

PN **Pneumatic Part**

S **Sensor**

W **Wheel/Wheel Part**

W **Has Page on FIRSTwiki**

Suppliers

- Amazon
- AndyMark
- Automation Direct
- BaneBots
- Cross The Road Electronics
- Digi-Key
- FIRST Choice
- FIRST Kit of Parts
- GPR Industrial
- Grainger
- Inventables
- MaxBotix
- McMaster-Carr
- REV Robotics
- Ruland (via Amazon)
- VEX EDR
- VEXpro

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Volume 1

Bearings

Belt/Chain Parts

Cables/Wires

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Volume 2

Last Update

Motor Controllers

Pneumatic Parts

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Changelog

Version 1.3 (1/31/18)

New parts added:

Sprockets, #35
Ball Shifter Mag Encoder Mount

Updates to:

Rigid Shaft Coupling
Pancake Pneumatic Cylinder
Omni Wheel, 6"

Part Number Charts Added:

#35 Sprockets Part Numbers
Ruland Rigid Shaft Coupling Part Numbers

Version 1.2.3 (1/26/18)

Motor Controllers moved to Volume 2
Section Header Pages added (Digital)

New parts added:

REV 1” Linear Motion Kit
REV 1” Extrusion

Updates to:

Bearing, FR8ZZ
REV 15mm Extrusion
ThunderHex Shaft
Shaft Adapter, 8mm to 1/2 Hex
Shaft Collar, 1/2 Hex
Shaft Collar, 1/2 Round
Shaft Collar, 3/8 Hex
Shaft Collar, 3/8 Round
Shaft Collar, 8mm
Shaft Coupler, 1/2 Hex
Retaining Ring, 8mm
SPARK
Gadgeteer Pigeon IMU

Version 1.2.2 (1/9/18)

New parts added:

REV 15mm Linear Motion Kit
REV 15mm Extrusion

Version 1.2.1 (1/8/18)

New parts added:

VersaBlock Kit and WCP Cam
VersaFrame Angle Stock
VersaFrame Bearing Mounts
VersaFrame C-Channel Stock
VersaFrame Gusset
VersaFrame Plastic Tube Stock
VersaFrame Tube Stock, 1x1x.1”
VersaFrame Tube Stock, 1x1x.04”
VersaFrame Tube Stock, 1x2x.1”
VersaFrame VP Mounts

Updates to:

Grayhill 63R Encoder

Part Number Charts added:

VersaFrame Gusset Part Numbers

Changelog

Version 1.2 (1/2/18)

Updates to:

Ethernet Microcontroller
Network Switch
Robot Signal Light (RSL)
Main Breaker, 120A
Quick-Disconnect Terminal
External Klipring, 1/2"
MiniCIM Motor
RS-775-18 Motor
LED Ring, Green
LED Ring, White
Microsoft Lifecam HD-3000
Miniature Basic Switch

Part Number Charts added:

Quick-Disconnect Terminal Part Numbers

Version 1.1.1 (Digital Only) (12/25/17)

Added Chart of Suppliers
Zip Tie entries consolidated into one entry
Wire Roll entries consolidated into one entry
PWM Cable entries consolidated into one entry

New parts added:

LED Connectors, 10mm, 3-Pin
LED Strip, Individually Addressable
PG Series Gearbox
Solenoid, Single, Mead
Spring Connector, 2-Way
Spring Connector, 3-Way

Updates to:

AM14U3 Inside Plate
AM14U3 Outer Plate
Bearing, FR608-ZZ
Compliant Wheel, 2"
Compliant Wheel, 4"
Solenoid, Double, Mead (Formerly Double Solenoid, Mead)
VersaPlanetary

Part Number Charts added:

Compliant Wheel, 4" Part Numbers
PG Series Gearbox Part Numbers
Wire Part Numbers
Zip Ties Part Numbers

Version 1.1 (12/20/17)

New parts added:

550 Vent Plate Spacer
57 Sport Gearbox
775 Vent Plate Spacer
AndyMark 775 RedLine Motor
BattHawk
CANifier
CIM Sport Gearbox
Dynamo Brushless Motor
Passive POE Injector
PWM Extension Retaining Clip
RedLine Encoder Kit
Victor SPX

Updates to:

NPT Fitting, Adapter (formerly NPT-NPT Fitting, Adapter)
NPT Fitting, Female Tee
NPT Fitting, Plug, 1/4"
NPT Fitting, Plug, 1/8"
NPT Fitting, Straight (formerly NPT-NPT Fitting, Straight)
PTC Fitting, Union Cross
PTC Fitting, Union Elbow
PTC Fitting, Union Straight
PTC Fitting, Union Tee
PTC Fitting, Union Y
PTC-NPT Fitting, Branch Tee
PTC-NPT Fitting, Elbow
PTC-NPT Fitting, Run Tee
PTC-NPT Fitting, Straight
PTC-NPT Fitting, Y
VersaPlanetary CIM Adapter (formerly VersaPlanetary CIM Adaptor)
Victor SP

Changelog

Version 1.0 (9/5/2017)

First edition of the manual published and given to the team.

Future Planned Updates

Addition of notes to the following parts:

Bearing, FR8ZZ
Grease
HYLUG Compression Terminal
Key Stock, 1/8”
Key Stock, 2mm
L-Bracket for AM14U2&3
Mecanum Wheel, 6” HD
Mecanum Wheel, 8” HD
Mecanum Wheel, 10”
Photoelectric Sensor
Power Converter (12/24-5VDC)
Shaft Stock, 1/2 Round Tube
Shaft Stock, 3/8” Hex
Shaft Stock, 3/8” Round Tube
Shaft Stock, 8mm Keyed
Spike H-Bridge Relay
Splice (Butt) Connector
Talon SRX Analog Breakout
Talon SRX Data Cable
Talon SRX Data Cable Header
Talon SRX Data Cable Ribbon Cable
Talon SRX Encoder Breakout Board
Ultrasonic Rangefinder, HRLV
Ultrasonic Rangefinder, LV
Ultrasonic Sensor, VEX
VersaDrop
VersaWheel
VP Dual Motor Input
VP Integrated Encoder

Addition of part number charts for the following parts:

Splice (Butt) Connector
VersaWheel

Link to drivers for Arduino Programmer Cable

New Parts

BE

BEARINGS

Bearing, 1614ZZ

The 1614ZZ bearing has a .375" ID and a 1.125" OD. It has been included in the KoP Drive Base Kit.

PRIOR USAGE

Usage Uncertain

Category

Supplier*

am-0209

Part Number

FINAL NOTES

This bearing is commonly used with 42 Tooth Half Pulleys to create dead-axle wheels.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bearing, FR6ZZ

This bearing has a 3/8" ID. The flange allows it to be mounted in a plate with a 7/8" hole.

PRIOR USAGE

Drivetrain | Sparky | 2016

Sparky used two Toughbox Mini gearboxes, which use one FR6ZZ bearing each.

Drivetrain | Heart of the Beast | 2017

The Heart of the Beast used four Toughbox Mini gearboxes, which use one FR6ZZ bearing each.

BE

Category

AndyMark

Supplier*

am-0028

Part Number

FINAL NOTES

Not much to see here, just a 3/8" ID bearing.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bearing, FR8ZZ

This bearing has a 1/2" Round ID and a 1.125" OD.

PRIOR USAGE

Every time we used a Toughbox Mini

Category

Supplier*

am-0030

Part Number

FINAL NOTES

These are good for holding 1/2" round shafts, but are usually just used with Toughbox Mini and CIMple gearboxes.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bearing, FR8ZZ-HexHD

The FR8ZZ-HexHD bearing has a ½" hex bore. It is used to hold ½" hex shafts, such as 500 churro and ThunderHex shafts. The outer diameter is 1.125".

PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm used at least two FR8ZZ-HexHD bearings.

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber used at least two FR8ZZ-HexHD bearings.

Intake | Heart of the Beast | 2017

The Heart of the Beast's intake may have used two FR8ZZ-HexHD bearings.

BE

Category

AndyMark

Supplier*

am-2986

Part Number

FINAL NOTES

The FR8ZZ-HexHD bearings are useful when adding a shaft that needs to spin. The flange helps keep the bearing where it is against another piece of metal with a 1 1/8" hole. A shaft collar can make this bearing stay where it is.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bearing, FR608-ZZ

This flanged bearing has an 8mm ID and 22mm OD.

PRIOR USAGE

Shooter | Heart of the Beast | 2017

The shooter on the Heart of the Beast used one of these bearings opposite the motor to hold the shaft in place.

Category

Supplier*

30169-01

Part Number

FINAL NOTES

These are used with 8mm shafts.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bearing, R6ZZ

This is a 3/8" ID bearing used in Toughbox Mini and Toughbox Micro gearboxes. Each gearbox uses two, both mounted in the gearbox housing.

PRIOR USAGE

Drivetrain | Sparky | 2016

Sparky used two Toughbox Mini gearboxes, which use two R6ZZ bearings each.

Drivetrain | Heart of the Beast | 2017

The Heart of the Beast used four Toughbox Mini gearboxes, which use two R6ZZ bearings each.

Category

Supplier*

am-0516

Part Number

FINAL NOTES

In each Toughbox Mini and Toughbox Micro, there are two small holes next to the large hole for the shaft that are used to remove the bearing.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

B/C

Belt/Chain Parts

Belt, 5M Pitch

5M (5mm) pitch belts are the most common in FRC. They have been included in the Kit of Parts since 2013. The 39- and 42-tooth pulleys accept 5M pitch belts. The most common sizes are 9mm, 15mm and 25mm wide belts (we usually use 15mm). The first number (xxxx-5M-yy) is the length of the belt in millimeters. The last number is the width of the belt in millimeters. GPR Industrial has most belt lengths from 180mm to 3770mm in length.

PRIOR USAGE

Drivetrain | Sparky | 2016

Sparky's drivetrain used four belts, two 600-5M-15 and two 1080-5M-15 belts.

Drivetrain | Heart of the Beast | 2017

The drivetrain on the Heart of the Beast used four belts (440-5M-15, 470-5M-15, 600-5M-15, 655-5M-15).

Intake | Heart of the Beast | 2017

The intake on the Heart of the Beast used a 520-5M-15 belt. The belt was rubbing against a bolt head, but the intake was used so infrequently that this was not a problem.

B/C

Category

GPR INDUSTRIAL

Supplier*

See Next 9 Pages

Part Number

FINAL NOTES

Belts are useful in low- to medium-torque applications, such as a drivetrain. In higher torque applications, such as running a climber, chain or direct drive is a better option.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

5M Belt Part Numbers

4 mm Width

Length	Part #
1500	1500-5M-04

6 mm Width

Length	Part #
565	565-5M-06

8 mm Width

Length	Part #
675	675-5M-08

9 mm Width

Length	Part #
180	180-5M-09
215	215-5M-09
220	220-5M-09
225	225-5M-09
230	230-5M-09
235	235-5M-09
240	240-5M-09
245	245-5M-09
250	250-5M-09
255	255-5M-09
260	260-5M-09
265	265-5M-09
270	270-5M-09
275	275-5M-09
280	280-5M-09
285	285-5M-09
295	295-5M-09
300	300-5M-09
305	305-5M-09
310	310-5M-09
315	315-5M-09
320	320-5M-09
325	325-5M-09
330	330-5M-09
340	340-5M-09
345	345-5M-09
350	350-5M-09
355	355-5M-09
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390	390-5M-09
395	395-5M-09
400	400-5M-09
405	405-5M-09
410	410-5M-09
415	415-5M-09
420	420-5M-09
425	425-5M-09
430	430-5M-09
435	435-5M-09
440	440-5M-09
445	445-5M-09
450	450-5M-09
455	455-5M-09
460	460-5M-09
465	465-5M-09
470	470-5M-09
475	475-5M-09
480	480-5M-09
485	485-5M-09
490	490-5M-09
500	500-5M-09
505	505-5M-09
510	510-5M-09
515	515-5M-09
520	520-5M-09
525	525-5M-09
530	530-5M-09
535	535-5M-09
540	540-5M-09
545	545-5M-09
550	550-5M-09
560	560-5M-09
565	565-5M-09
570	570-5M-09
575	575-5M-09
580	580-5M-09
585	585-5M-09
590	590-5M-09
595	595-5M-09
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615	615-5M-09
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625	625-5M-09
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635	635-5M-09
640	640-5M-09
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650	650-5M-09
655	655-5M-09
660	660-5M-09
665	665-5M-09
670	670-5M-09
675	675-5M-09
680	680-5M-09
690	690-5M-09
695	695-5M-09
700	700-5M-09
710	710-5M-09
715	715-5M-09
720	720-5M-09
725	725-5M-09
730	730-5M-09
735	735-5M-09
740	740-5M-09
745	745-5M-09
750	750-5M-09
755	755-5M-09
760	760-5M-09
765	765-5M-09
770	770-5M-09
775	775-5M-09
780	780-5M-09
790	790-5M-09
800	800-5M-09
810	810-5M-09
815	815-5M-09
820	820-5M-09

5M Belt Part Numbers

Length	Part #
825	**825-5M-09**
830	**830-5M-09**
835	**835-5M-09**
840	**840-5M-09**
845	**845-5M-09**
850	**850-5M-09**
860	**860-5M-09**
865	**865-5M-09**
870	**870-5M-09**
880	**880-5M-09**
890	**890-5M-09**
895	**895-5M-09**
900	**900-5M-09**
910	**910-5M-09**
920	**920-5M-09**
925	**925-5M-09**
930	**930-5M-09**
935	**935-5M-09**
940	**940-5M-09**
950	**950-5M-09**
960	**960-5M-09**
965	**965-5M-09**
975	**975-5M-09**
980	**980-5M-09**
990	**990-5M-09**
1000	**1000-5M-09**
1020	**1020-5M-09**
1025	**1025-5M-09**
1035	**1035-5M-09**
1040	**1040-5M-09**
1050	**1050-5M-09**
1060	**1060-5M-09**
1080	**1080-5M-09**
1100	**1100-5M-09**
1105	**1105-5M-09**
1110	**1110-5M-09**
1115	**1115-5M-09**
1125	**1125-5M-09**
1135	**1135-5M-09**
1145	**1145-5M-09**
1150	**1150-5M-09**
1160	**1160-5M-09**

Length	Part #
1175	**1175-5M-09**
1180	**1180-5M-09**
1185	**1185-5M-09**
1195	**1195-5M-09**
1200	**1200-5M-09**
1210	**1210-5M-09**
1225	**1225-5M-09**
1235	**1235-5M-09**
1240	**1240-5M-09**
1250	**1250-5M-09**
1260	**1260-5M-09**
1270	**1270-5M-09**
1280	**1280-5M-09**
1295	**1295-5M-09**
1300	**1300-5M-09**
1335	**1335-5M-09**
1350	**1350-5M-09**
1375	**1375-5M-09**
1380	**1380-5M-09**
1390	**1390-5M-09**
1400	**1400-5M-09**
1420	**1420-5M-09**
1425	**1425-5M-09**
1450	**1450-5M-09**
1455	**1455-5M-09**
1490	**1490-5M-09**
1500	**1500-5M-09**
1520	**1520-5M-09**
1525	**1525-5M-09**
1530	**1530-5M-09**
1585	**1585-5M-09**
1595	**1595-5M-09**
1600	**1600-5M-09**
1615	**1615-5M-09**
1670	**1670-5M-09**
1685	**1685-5M-09**
1690	**1690-5M-09**
1700	**1700-5M-09**
1720	**1720-5M-09**
1730	**1730-5M-09**
1750	**1750-5M-09**
1780	**1780-5M-09**

Length	Part #
1790	**1790-5M-09**
1800	**1800-5M-09**
1870	**1870-5M-09**
1880	**1880-5M-09**
1895	**1895-5M-09**
1945	**1945-5M-09**
1960	**1960-5M-09**
2000	**2000-5M-09**
2100	**2100-5M-09**
2110	**2110-5M-09**
2250	**2250-5M-09**
2350	**2350-5M-09**
2375	**2375-5M-09**
2525	**2525-5M-09**
2750	**2750-5M-09**
3255	**3255-5M-09**
3370	**3370-5M-09**
3750	**3750-5M-09**
3770	**3770-5M-09**

10 mm Width

Length	Part #
245	**245-5M-10**
450	**450-5M-10**
825	**825-5M-10**

12 mm Width

Length	Part #
600	**600-5M-12**
1225	**1225-5M-12**

13 mm Width

Length	Part #
570	**570-5M-13**

5M Belt Part Numbers

15 mm Width

Length	Part #
180	180-5M-15
215	215-5M-15
220	220-5M-15
225	225-5M-15
230	230-5M-15
235	235-5M-15
240	240-5M-15
245	245-5M-15
250	250-5M-15
255	255-5M-15
260	260-5M-15
265	265-5M-15
270	270-5M-15
275	275-5M-15
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285	285-5M-15
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315	315-5M-15
320	320-5M-15
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365	365-5M-15
370	370-5M-15
375	375-5M-15
380	380-5M-15
385	385-5M-15
390	390-5M-15
395	395-5M-15
400	400-5M-15
405	405-5M-15
410	410-5M-15
415	415-5M-15
420	420-5M-15

Length	Part #
425	425-5M-15
430	430-5M-15
435	435-5M-15
440	440-5M-15
445	445-5M-15
450	450-5M-15
455	455-5M-15
460	460-5M-15
465	465-5M-15
470	470-5M-15
475	475-5M-15
480	480-5M-15
485	485-5M-15
490	490-5M-15
500	500-5M-15
505	505-5M-15
510	510-5M-15
515	515-5M-15
520	520-5M-15
525	525-5M-15
530	530-5M-15
535	535-5M-15
540	540-5M-15
545	545-5M-15
550	550-5M-15
560	560-5M-15
565	565-5M-15
570	570-5M-15
575	575-5M-15
580	580-5M-15
585	585-5M-15
590	590-5M-15
595	595-5M-15
600	600-5M-15
610	610-5M-15
615	615-5M-15
620	620-5M-15
625	625-5M-15
630	630-5M-15
635	635-5M-15
640	640-5M-15
645	645-5M-15

Length	Part #
650	650-5M-15
655	655-5M-15
660	660-5M-15
665	665-5M-15
670	670-5M-15
675	675-5M-15
680	680-5M-15
690	690-5M-15
695	695-5M-15
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725	725-5M-15
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735	735-5M-15
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750	750-5M-15
755	755-5M-15
760	760-5M-15
765	765-5M-15
770	770-5M-15
775	775-5M-15
780	780-5M-15
790	790-5M-15
800	800-5M-15
810	810-5M-15
815	815-5M-15
820	820-5M-15
825	825-5M-15
830	830-5M-15
835	835-5M-15
840	840-5M-15
845	845-5M-15
850	850-5M-15
860	860-5M-15
865	865-5M-15
870	870-5M-15
880	880-5M-15
890	890-5M-15
895	895-5M-15

5M Belt Part Numbers

Length	Part #
900	**900-5M-15**
910	**910-5M-15**
920	**920-5M-15**
925	**925-5M-15**
930	**930-5M-15**
935	**935-5M-15**
940	**940-5M-15**
950	**950-5M-15**
960	**960-5M-15**
965	**965-5M-15**
975	**975-5M-15**
980	**980-5M-15**
990	**990-5M-15**
1000	**1000-5M-15**
1020	**1020-5M-15**
1025	**1025-5M-15**
1035	**1035-5M-15**
1040	**1040-5M-15**
1050	**1050-5M-15**
1060	**1060-5M-15**
1080	**1080-5M-15**
1100	**1100-5M-15**
1105	**1105-5M-15**
1110	**1110-5M-15**
1115	**1115-5M-15**
1125	**1125-5M-15**
1135	**1135-5M-15**
1145	**1145-5M-15**
1150	**1150-5M-15**
1160	**1160-5M-15**
1175	**1175-5M-15**
1180	**1180-5M-15**
1185	**1185-5M-15**
1195	**1195-5M-15**
1200	**1200-5M-15**
1210	**1210-5M-15**
1225	**1225-5M-15**
1235	**1235-5M-15**
1240	**1240-5M-15**
1250	**1250-5M-15**
1260	**1260-5M-15**
1270	**1270-5M-15**

Length	Part #
1280	**1280-5M-15**
1295	**1295-5M-15**
1300	**1300-5M-15**
1335	**1335-5M-15**
1350	**1350-5M-15**
1375	**1375-5M-15**
1380	**1380-5M-15**
1390	**1390-5M-15**
1400	**1400-5M-15**
1420	**1420-5M-15**
1425	**1425-5M-15**
1450	**1450-5M-15**
1455	**1455-5M-15**
1490	**1490-5M-15**
1500	**1500-5M-15**
1520	**1520-5M-15**
1525	**1525-5M-15**
1530	**1530-5M-15**
1585	**1585-5M-15**
1595	**1595-5M-15**
1600	**1600-5M-15**
1615	**1615-5M-15**
1670	**1670-5M-15**
1685	**1685-5M-15**
1690	**1690-5M-15**
1700	**1700-5M-15**
1720	**1720-5M-15**
1730	**1730-5M-15**
1750	**1750-5M-15**
1780	**1780-5M-15**
1790	**1790-5M-15**
1800	**1800-5M-15**
1870	**1870-5M-15**
1880	**1880-5M-15**
1895	**1895-5M-15**
1945	**1945-5M-15**
1960	**1960-5M-15**
2000	**2000-5M-15**
2100	**2100-5M-15**
2110	**2110-5M-15**
2250	**2250-5M-15**
2350	**2350-5M-15**

Length	Part #
2375	**2375-5M-15**
2525	**2525-5M-15**
2750	**2750-5M-15**
3255	**3255-5M-15**
3370	**3370-5M-15**
3750	**3750-5M-15**
3770	**3770-5M-15**

16 mm Width

Length	Part #
570	**570-5M-16**
1200	**1200-5M-16**

20 mm Width

Length	Part #
390	**390-5M-20**
450	**450-5M-20**
635	**635-5M-20**
670	**670-5M-20**
740	**740-5M-20**
800	**800-5M-20**
845	**845-5M-20**
1040	**1040-5M-20**
1870	**1870-5M-20**

25 mm Width

Length	Part #
180	**180-5M-25**
215	**215-5M-25**
220	**220-5M-25**
225	**225-5M-25**
230	**230-5M-25**
235	**235-5M-25**
240	**240-5M-25**
245	**245-5M-25**
250	**250-5M-25**
255	**255-5M-25**
260	**260-5M-25**
265	**265-5M-25**
270	**270-5M-25**
275	**275-5M-25**
280	**280-5M-25**
285	**285-5M-25**

5M Belt Part Numbers

Length	Part #
295	**295-5M-25**
300	**300-5M-25**
305	**305-5M-25**
310	**310-5M-25**
315	**315-5M-25**
320	**320-5M-25**
325	**325-5M-25**
330	**330-5M-25**
340	**340-5M-25**
345	**345-5M-25**
350	**350-5M-25**
355	**355-5M-25**
360	**360-5M-25**
365	**365-5M-25**
370	**370-5M-25**
375	**375-5M-25**
380	**380-5M-25**
385	**385-5M-25**
390	**390-5M-25**
395	**395-5M-25**
400	**400-5M-25**
405	**405-5M-25**
410	**410-5M-25**
415	**415-5M-25**
420	**420-5M-25**
425	**425-5M-25**
430	**430-5M-25**
435	**435-5M-25**
440	**440-5M-25**
445	**445-5M-25**
450	**450-5M-25**
455	**455-5M-25**
460	**460-5M-25**
465	**465-5M-25**
470	**470-5M-25**
475	**475-5M-25**
480	**480-5M-25**
485	**485-5M-25**
490	**490-5M-25**
500	**500-5M-25**
505	**505-5M-25**
510	**510-5M-25**

Length	Part #
515	**515-5M-25**
520	**520-5M-25**
525	**525-5M-25**
530	**530-5M-25**
535	**535-5M-25**
540	**540-5M-25**
545	**545-5M-25**
550	**550-5M-25**
560	**560-5M-25**
565	**565-5M-25**
570	**570-5M-25**
575	**575-5M-25**
580	**580-5M-25**
585	**585-5M-25**
590	**590-5M-25**
595	**595-5M-25**
600	**600-5M-25**
610	**610-5M-25**
615	**615-5M-25**
620	**620-5M-25**
625	**625-5M-25**
630	**630-5M-25**
635	**635-5M-25**
640	**640-5M-25**
645	**645-5M-25**
650	**650-5M-25**
655	**655-5M-25**
660	**660-5M-25**
665	**665-5M-25**
670	**670-5M-25**
675	**675-5M-25**
680	**680-5M-25**
690	**690-5M-25**
695	**695-5M-25**
700	**700-5M-25**
710	**710-5M-25**
715	**715-5M-25**
720	**720-5M-25**
725	**725-5M-25**
730	**730-5M-25**
735	**735-5M-25**
740	**740-5M-25**

Length	Part #
745	**745-5M-25**
750	**750-5M-25**
755	**755-5M-25**
760	**760-5M-25**
765	**765-5M-25**
770	**770-5M-25**
775	**775-5M-25**
780	**780-5M-25**
790	**790-5M-25**
800	**800-5M-25**
810	**810-5M-25**
815	**815-5M-25**
820	**820-5M-25**
825	**825-5M-25**
830	**830-5M-25**
835	**835-5M-25**
840	**840-5M-25**
845	**845-5M-25**
850	**850-5M-25**
860	**860-5M-25**
865	**865-5M-25**
870	**870-5M-25**
880	**880-5M-25**
890	**890-5M-25**
895	**895-5M-25**
900	**900-5M-25**
910	**910-5M-25**
920	**920-5M-25**
925	**925-5M-25**
930	**930-5M-25**
935	**935-5M-25**
940	**940-5M-25**
950	**950-5M-25**
960	**960-5M-25**
965	**965-5M-25**
975	**975-5M-25**
980	**980-5M-25**
990	**990-5M-25**
1000	**1000-5M-25**
1020	**1020-5M-25**
1025	**1025-5M-25**
1035	**1035-5M-25**

5M Belt Part Numbers

Length	Part #
1040	**1040-5M-25**
1050	**1050-5M-25**
1060	**1060-5M-25**
1080	**1080-5M-25**
1100	**1100-5M-25**
1105	**1105-5M-25**
1110	**1110-5M-25**
1115	**1115-5M-25**
1125	**1125-5M-25**
1135	**1135-5M-25**
1145	**1145-5M-25**
1150	**1150-5M-25**
1160	**1160-5M-25**
1175	**1175-5M-25**
1180	**1180-5M-25**
1185	**1185-5M-25**
1195	**1195-5M-25**
1200	**1200-5M-25**
1210	**1210-5M-25**
1225	**1225-5M-25**
1235	**1235-5M-25**
1240	**1240-5M-25**
1250	**1250-5M-25**
1260	**1260-5M-25**
1270	**1270-5M-25**
1280	**1280-5M-25**
1295	**1295-5M-25**
1300	**1300-5M-25**
1335	**1335-5M-25**
1350	**1350-5M-25**
1375	**1375-5M-25**
1380	**1380-5M-25**
1390	**1390-5M-25**
1400	**1400-5M-25**
1420	**1420-5M-25**
1425	**1425-5M-25**
1450	**1450-5M-25**
1455	**1455-5M-25**
1490	**1490-5M-25**
1500	**1500-5M-25**
1520	**1520-5M-25**
1525	**1525-5M-25**
1530	**1530-5M-25**
1585	**1585-5M-25**
1595	**1595-5M-25**
1600	**1600-5M-25**
1615	**1615-5M-25**
1670	**1670-5M-25**
1685	**1685-5M-25**
1690	**1690-5M-25**
1700	**1700-5M-25**
1720	**1720-5M-25**
1730	**1730-5M-25**
1750	**1750-5M-25**
1780	**1780-5M-25**
1790	**1790-5M-25**
1800	**1800-5M-25**
1870	**1870-5M-25**
1880	**1880-5M-25**
1895	**1895-5M-25**
1945	**1945-5M-25**
1960	**1960-5M-25**
2000	**2000-5M-25**
2100	**2100-5M-25**
2110	**2110-5M-25**
2250	**2250-5M-25**
2350	**2350-5M-25**
2375	**2375-5M-25**
2525	**2525-5M-25**
2750	**2750-5M-25**
3255	**3255-5M-25**
3370	**3370-5M-25**
3750	**3750-5M-25**
3770	**3770-5M-25**

26 mm Width

Length	Part #
350	**350-5M-26**

30 mm Width

Length	Part #
425	**425-5M-30**
550	**550-5M-30**
635	**635-5M-30**
700	**700-5M-30**
800	**800-5M-30**
1000	**1000-5M-30**
1390	**1390-5M-30**
2000	**2000-5M-30**

32 mm Width

Length	Part #
550	**550-5M-32**
845	**845-5M-32**

35 mm Width

Length	Part #
1500	**1500-5M-04**

36 mm Width

Length	Part #
950	**950-5M-36**

40 mm Width

Length	Part #
400	**400-5M-40**
925	**925-5M-40**
1000	**1000-5M-40**

45 mm Width

Length	Part #
425	**425-5M-45**

50 mm Width

Length	Part #
800	**800-5M-50**
1390	**1390-5M-50**

85 mm Width

Length	Part #
425	**425-5M-85**

5M Belt Part Numbers

101 mm Width

Length	Part #
920	920-5M-101

180 mm Width

Length	Part #
245	245-5M-180
295	295-5M-180

190 mm Width

Length	Part #
180	180-5M-190
215	215-5M-190
220	200-5M-190
225	225-5M-190
230	230-5M-190
240	240-5M-190
270	270-5M-190
285	285-5M-190
320	320-5M-190
325	325-5M-190
330	330-5M-190
340	340-5M-190
960	960-5M-190

200 mm Width

Length	Part #
225	225-5M-200
235	235-5M-200
240	240-5M-200
245	245-5M-200
270	270-5M-200
275	275-5M-200
285	285-5M-200
295	295-5M-200
1700	1700-5M-200

250 mm Width

Length	Part #
1685	1685-5M-250
1690	1690-5M-250
1720	1720-5M-250

370 mm Width

Length	Part #
235	235-5M-370

380 mm Width

Length	Part #
1730	1730-5M-380
1750	1750-5M-380
1780	1780-5M-380
1790	1790-5M-380
1800	1800-5M-380
1870	1870-5M-380
1880	1880-5M-380
1895	1895-5M-380
1945	1945-5M-380
1960	1960-5M-380
2000	2000-5M-380
2100	2100-5M-380
2110	2110-5M-380
2250	2250-5M-380
2350	2350-5M-380
2375	2375-5M-380
2525	2525-5M-380
2750	2750-5M-380
3255	3255-5M-380
3370	3370-5M-380
3750	3750-5M-380
3770	3770-5M-380

400 mm Width

Length	Part #
235	235-5M-400

420 mm Width

Length	Part #
255	255-5M-420

430 mm Width

Length	Part #
250	250-5M-430
260	260-5M-430
265	265-5M-430
275	275-5M-430
280	280-5M-430
300	300-5M-430
305	305-5M-430
310	310-5M-430
315	315-5M-430
400	400-5M-430
420	420-5M-430
550	550-5M-430
625	625-5M-430

440 mm Width

Length	Part #
1180	1180-5M-440
1300	1300-5M-440
1450	1450-5M-440

450 mm Width

Length	Part #
250	250-5M-450
310	310-5M-450
345	345-5M-450
350	350-5M-450
355	355-5M-450
360	360-5M-450
365	365-5M-450
370	370-5M-450
375	375-5M-450
380	380-5M-450
385	385-5M-450
390	390-5M-450
395	395-5M-450
400	400-5M-450
405	405-5M-450
410	410-5M-450
415	415-5M-450
425	425-5M-450
430	430-5M-450
435	435-5M-450
440	440-5M-450
445	445-5M-450
450	450-5M-450

5M Belt Part Numbers

Length	Part #
455	**455-5M-450**
460	**460-5M-450**
465	**465-5M-450**
470	**470-5M-450**
475	**475-5M-450**
480	**480-5M-450**
485	**485-5M-450**
490	**490-5M-450**
500	**500-5M-450**
505	**505-5M-450**
510	**510-5M-450**
515	**515-5M-450**
520	**520-5M-450**
525	**525-5M-450**
530	**530-5M-450**
535	**535-5M-450**
540	**540-5M-450**
545	**545-5M-450**
550	**550-5M-450**
560	**560-5M-450**
565	**565-5M-450**
570	**570-5M-450**
575	**575-5M-450**
580	**580-5M-450**
585	**585-5M-450**
590	**590-5M-450**
595	**595-5M-450**
600	**600-5M-450**
610	**610-5M-450**
615	**615-5M-450**
620	**620-5M-450**
630	**630-5M-450**
635	**635-5M-450**
640	**640-5M-450**
645	**645-5M-450**
650	**650-5M-450**
655	**655-5M-450**
660	**660-5M-450**
665	**665-5M-450**
670	**670-5M-450**
675	**675-5M-450**
680	**680-5M-450**

Length	Part #
690	**690-5M-450**
695	**695-5M-450**
700	**700-5M-450**
710	**710-5M-450**
715	**715-5M-450**
720	**720-5M-450**
725	**725-5M-450**
730	**730-5M-450**
735	**735-5M-450**
740	**740-5M-450**
745	**745-5M-450**
750	**750-5M-450**
755	**755-5M-450**
760	**760-5M-450**
765	**765-5M-450**
770	**770-5M-450**
775	**775-5M-450**
780	**780-5M-450**
790	**790-5M-450**
800	**800-5M-450**
810	**810-5M-450**
815	**815-5M-450**
820	**820-5M-450**
825	**825-5M-450**
830	**830-5M-450**
835	**835-5M-450**
840	**840-5M-450**
845	**845-5M-450**
850	**850-5M-450**
860	**860-5M-450**
865	**865-5M-450**
870	**870-5M-450**
880	**880-5M-450**
890	**890-5M-450**
895	**895-5M-450**
900	**900-5M-450**
910	**910-5M-450**
920	**920-5M-450**
925	**925-5M-450**
930	**930-5M-450**
935	**935-5M-450**
940	**940-5M-450**

Length	Part #
950	**950-5M-450**
965	**965-5M-450**
975	**975-5M-450**
980	**980-5M-450**
990	**990-5M-450**
1000	**1000-5M-450**
1020	**1020-5M-450**
1025	**1025-5M-450**
1035	**1035-5M-450**
1040	**1040-5M-450**
1050	**1050-5M-450**
1060	**1060-5M-450**
1080	**1080-5M-450**
1100	**1100-5M-450**
1105	**1105-5M-450**
1110	**1110-5M-450**
1115	**1115-5M-450**
1125	**1125-5M-450**
1135	**1135-5M-450**
1145	**1145-5M-450**
1150	**1150-5M-450**
1160	**1160-5M-450**
1175	**1175-5M-450**
1185	**1185-5M-450**
1195	**1195-5M-450**
1200	**1200-5M-450**
1210	**1210-5M-450**
1225	**1225-5M-450**
1235	**1235-5M-450**
1240	**1240-5M-450**
1250	**1250-5M-450**
1260	**1260-5M-450**
1270	**1270-5M-450**
1280	**1280-5M-450**
1295	**1295-5M-450**
1335	**1335-5M-450**
1350	**1350-5M-450**
1375	**1375-5M-450**
1380	**1380-5M-450**
1390	**1390-5M-450**
1400	**1400-5M-450**
1420	**1420-5M-450**

5M Belt Part Numbers

Length	Part #
1425	**1425-5M-450**
1455	**1455-5M-450**
1490	**1490-5M-450**
1500	**1500-5M-450**
1520	**1520-5M-450**
1525	**1525-5M-450**
1530	**1530-5M-450**
1585	**1585-5M-450**
1595	**1595-5M-450**
1600	**1600-5M-450**
1615	**1615-5M-450**
1670	**1670-5M-450**

Pulley, 39 Tooth

39 tooth pulleys are used for drivetrain gearbox outputs. The older 39 tooth pulleys in former KoPs were made of aluminum and had keyed bores. The newer pulleys are made with plastic with an aluminum hub that can come with a keyed bore or hex bore hub. There is a plastic spacer that is placed behind the pulley with the face of the metal hub facing out.

PRIOR USAGE

Drive Train | Sparky | 2016

Sparky's drive train had two aluminum 39 tooth pulleys, one for each side/gearbox.

Drive Train | Heart of the Beast | 2017

The Heart of the Beast had four keyed bore plastic 39 tooth pulleys, on for each gearbox.

B/C

Category

AndyMark

Supplier*

am-2361 (keyed bore)

am-2502 (hex bore)

Part Number

FINAL NOTES

The 39 tooth pulley is used for gearbox outputs. The pulley has a 5M pitch.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Pulley, 42 Tooth

Each 42 tooth pulley comes in two halves. There are bumps that fit with holes on the other half. Make sure these are lined up. They are fastened together when they are attached to a wheel.

PRIOR USAGE

Drive Train | Sparky | 2016

Sparky's drive train had a 42 tooth pulley on each wheel (four total).

Drive Train | Heart of the Beast | 2017

The Heart of the Beast had four 42 tooth pulleys

B/C

Category

AndyMark

Supplier*

am-2234

Part Number

FINAL NOTES

Be sure that the holes and bumps are lined up during assembly

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Sprockets, #35

Sprockets are used to transfer power via a chain to another shaft. #35 is the most common in FRC. Hub sprockets have a hex bore or a keyway and/or set screws to transfer power to the shaft. Plate sprockets are usually attached to wheels or other hubs. Double hub sprockets have two sets of teeth for two chains to be connected.

PRIOR USAGE

Each time we use chain in a subsystem.

B/C

Category

McMASTER VEX PRO

Supplier*

See Next 7 Pages

Part Number

FINAL NOTES

As always with chain, keep the sprockets lined up. #35 chain and sprockets are not compatible with #25 chain and sprockets.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

#35 Sprockets Part Numbers

Plate Sprocket, 1.125” Bore

Teeth	Material	Supplier	Part Number
22	Aluminum	VEXpro	**217-2688**
24	Aluminum	VEXpro	**217-2655**
26	Aluminum	VEXpro	**217-2654**
28	Aluminum	VEXpro	**217-2653**
30	Aluminum	VEXpro	**217-2652**
32	Aluminum	VEXpro	**217-2651**
33	Aluminum	VEXpro	**217-2650**
36	Aluminum	VEXpro	**217-2649**
42	Aluminum	VEXpro	**217-2648**
44	Aluminum	VEXpro	**217-2647**
48	Aluminum	VEXpro	**217-2646**
54	Aluminum	VEXpro	**217-2645**
60	Aluminum	VEXpro	**217-2644**

Single Hub Sprockets, Hex Bore

Bore	Teeth	Material	Supplier	Part Number
1/2	12	Steel	VEXpro	**217-5843**
1/2	12	Aluminum	VEXpro	**217-2662**
1/2	15	Steel	VEXpro	**217-5844**
1/2	15	Aluminum	VEXpro	**217-2660**

Double Hub Sprockets, Hex Bore

Bore	Teeth	Material	Supplier	Part Number
1/2	12	Steel	VEXpro	**217-5845**
1/2	12	Aluminum	VEXpro	**217-2658**
1/2	15	Steel	VEXpro	**217-5846**
1/2	15	Aluminum	VEXpro	**217-2656**

Single Hub Sprockets, Round Bore, No Set Screws, With Keyway

Bore	Teeth	Keyway	Material	Supplier	Part Number
1/2	12	1/8	Steel	VEXpro	**217-5847**
1/2	12	1/8	Aluminum	VEXpro	**217-2663**
1/2	15	1/8	Steel	VEXpro	**217-5848**
1/2	15	1/8	Aluminum	VEXpro	**217-2661**

Double Hub Sprockets, Round Bore, No Set Screws, With Keyway

Bore	Teeth	Keyway	Material	Supplier	Part Number
1/2	12	1/8	Steel	VEXpro	**217-5849**
1/2	12	1/8	Aluminum	VEXpro	**217-2659**

#35 Sprockets Part Numbers

Bore	Teeth	Keyway	Material	Supplier	Part Number
1/2	15	1/8	Steel	VEXpro	**217-5850**
1/2	15	1/8	Aluminum	VEXpro	**217-2657**

Single Hub Sprockets, Round Bore, Set Screws, No Keyway

Bore	Teeth	Set Screw	Material	Supplier	Part Number
3/8	9	#8-32	Steel	Grainger	**6L774**
3/8	9	#8-32	Carbon Steel	Grainger	**6L775**
3/8	9	1/4-20	Steel	McMaster	**6280K311**
3/8	10	1/4-20	Steel	McMaster	**6280K321**
3/8	11	#8-32	Steel	Grainger	**6L778**
3/8	11	1/4-20	Steel	McMaster	**6280K331**
1/2	10	#10-24	Carbon Steel	Grainger	**6L776**
1/2	10	1/4-20	Steel	McMaster	**6280K322**
1/2	11	#10-24	Steel	Grainger	**36GA18**
1/2	11	1/4-20	Steel	McMaster	**6280K332**
1/2	12	#10-24	Steel	Grainger	**6L782**
1/2	12	1/4-20	Steel	McMaster	**6280K341**
1/2	13	#10-24	Steel	Grainger	**36GA22**
1/2	13	1/4-20	Steel	McMaster	**6280K351**
1/2	14	#10-24	Steel	Grainger	**36GA24**
1/2	14	1/4-20	Steel	McMaster	**6280K361**
1/2	15	#10-24	Steel	Grainger	**6L791**
1/2	15	1/4-20	Steel	McMaster	**6280K371**
1/2	16	#10-24	Steel	Grainger	**36GA30**
1/2	16	1/4-20	Steel	McMaster	**6280K381**
1/2	17	#10-24	Steel	Grainger	**6L799**
1/2	17	1/4-20	Steel	McMaster	**6280K391**
1/2	18	#10-24	Steel	Grainger	**36GA36**
1/2	18	1/4-20	Steel	McMaster	**6280K401**
1/2	19	#10-24	Steel	Grainger	**6L807**
1/2	19	1/4-20	Steel	McMaster	**6280K159**
1/2	20	#10-24	Steel	Grainger	**36GA40**
1/2	20	1/4-20	Steel	McMaster	**6280K384**
1/2	21	1/4-20	Steel	McMaster	**6280K404**
1/2	22	1/4-20	Steel	McMaster	**6280K514**
1/2	23	1/4-20	Steel	McMaster	**6280K524**
1/2	24	#10-24	Steel	Grainger	**6L827**
1/2	24	1/4-20	Steel	McMaster	**6280K129**
1/2	25	#10-24	Steel	Grainger	**6L831**
1/2	25	1/4-20	Steel	McMaster	**6280K224**

#35 Sprockets Part Numbers

Single Hub Sprockets, Round Bore, Set Screws, With Keyway

Bore	Teeth	Set Screw	Keyway	Material	Supplier	Part Number
5/8	10	1/4-20	3/16	Steel	Grainger	**36GA17**
5/8	10	1/4-20	3/16	Carbon Steel	Grainger	**6L777**
5/8	10	1/4-20	3/16	Steel	McMaster	**6280K323**
5/8	11	1/4-20	3/16	Steel	Grainger	**36GA20**
5/8	11	1/4-20	3/16	Steel	McMaster	**6280K333**
5/8	12	1/4-20	3/16	Steel	Grainger	**36GA21**
5/8	12	1/4-20	3/16	Steel	McMaster	**6280K342**
5/8	13	1/4-20	3/16	Steel	Grainger	**36GA23**
5/8	13	1/4-20	3/16	Steel	McMaster	**6280K352**
5/8	14	1/4-20	3/16	Steel	Grainger	**6L789**
5/8	14	1/4-20	3/16	Steel	McMaster	**6280K362**
5/8	15	1/4-20	3/16	Steel	Grainger	**36GA28**
5/8	15	1/4-20	3/16	Steel	McMaster	**6280K372**
5/8	16	1/4-20	3/16	Steel	Grainger	**36GA32**
5/8	16	1/4-20	3/16	Steel	McMaster	**6280K382**
5/8	17	1/4-20	3/16	Steel	Grainger	**36GA35**
5/8	17	1/4-20	3/16	Steel	McMaster	**6280K392**
5/8	18	1/4-20	3/16	Steel	Grainger	**6L804**
5/8	18	1/4-20	3/16	Steel	McMaster	**6280K402**
5/8	19	1/4-20	3/16	Steel	Grainger	**36GA39**
5/8	19	1/4-20	3/16	Steel	McMaster	**6280K411**
5/8	20	1/4-20	3/16	Steel	Grainger	**36GA42**
5/8	20	1/4-20	3/16	Steel	McMaster	**6280K421**
5/8	21	1/4-20	3/16	Steel	McMaster	**6280K431**
5/8	22	1/4-20	3/16	Steel	McMaster	**6280K441**
5/8	23	1/4-20	3/16	Steel	McMaster	**6280K451**
5/8	24	1/4-20	3/16	Steel	Grainger	**36GA45**
5/8	24	1/4-20	3/16	Steel	McMaster	**6280K461**
5/8	25	1/4-20	3/16	Steel	Grainger	**6L832**
5/8	25	1/4-20	3/16	Steel	McMaster	**6236K221**
5/8	26	1/4-20	3/16	Steel	McMaster	**6236K101**
5/8	28	1/4-20	3/16	Steel	Grainger	**36GA48**
5/8	28	1/4-20	3/16	Steel	McMaster	**6236K108**
5/8	30	1/4-20	3/16	Steel	McMaster	**6236K231**
5/8	32	1/4-20	3/16	Steel	McMaster	**6236K116**
5/8	35	1/4-20	3/16	Steel	McMaster	**6236K691**
5/8	36	1/4-20	3/16	Steel	McMaster	**6236K124**
5/8	40	1/4-20	3/16	Steel	McMaster	**6236K251**
5/8	48	1/4-20	3/16	Steel	McMaster	**6236K802**
5/8	54	1/4-20	3/16	Steel	McMaster	**2737T521**
5/8	60	1/4-20	3/16	Steel	McMaster	**6236K274**

#35 Sprockets Part Numbers

Bore	Teeth	Set Screw	Keyway	Material	Supplier	Part Number
3/4	11	1/4-20	3/16	Steel	Grainger	**36GA19**
3/4	11	1/4-20	3/16	Steel	McMaster	**6280K334**
3/4	12	1/4-20	3/16	Steel	Grainger	**6L784**
3/4	12	1/4-20	3/16	Steel	McMaster	**6280K343**
3/4	13	1/4-20	3/16	Steel	Grainger	**6L787**
3/4	13	1/4-20	3/16	Steel	McMaster	**6280K353**
3/4	14	1/4-20	3/16	Steel	Grainger	**36GA25**
3/4	14	1/4-20	3/16	Steel	McMaster	**6280K363**
3/4	15	1/4-20	3/16	Steel	Grainger	**36GA27**
3/4	15	1/4-20	3/16	Steel	McMaster	**6280K373**
3/4	16	1/4-20	3/16	Steel	Grainger	**36GA31**
3/4	16	1/4-20	3/16	Steel	McMaster	**6280K383**
3/4	17	1/4-20	3/16	Steel	Grainger	**36GA34**
3/4	17	1/4-20	3/16	Steel	McMaster	**6280K393**
3/4	18	1/4-20	3/16	Steel	Grainger	**36GA37**
3/4	18	1/4-20	3/16	Steel	McMaster	**6280K403**
3/4	19	1/4-20	3/16	Steel	Grainger	**6L809**
3/4	19	1/4-20	3/16	Steel	McMaster	**6280K412**
3/4	20	1/4-20	3/16	Steel	Grainger	**36GA41**
3/4	20	1/4-20	3/16	Steel	McMaster	**6280K422**
3/4	21	1/4-20	3/16	Steel	McMaster	**6280K432**
3/4	22	1/4-20	3/16	Steel	Grainger	**36GA43**
3/4	22	1/4-20	3/16	Steel	McMaster	**6280K442**
3/4	23	1/4-20	3/16	Steel	McMaster	**6280K452**
3/4	24	1/4-20	3/16	Steel	Grainger	**36GA44**
3/4	24	1/4-20	3/16	Steel	McMaster	**6280K462**
3/4	25	1/4-20	3/16	Steel	Grainger	**36GA46**
3/4	25	1/4-20	3/16	Steel	McMaster	**6236K222**
3/4	26	1/4-20	3/16	Steel	McMaster	**6236K102**
3/4	28	1/4-20	3/16	Steel	McMaster	**6236K109**
3/4	30	1/4-20	3/16	Steel	McMaster	**6236K232**
3/4	32	1/4-20	3/16	Steel	McMaster	**6236K117**
3/4	35	1/4-20	3/16	Steel	McMaster	**6236K692**
3/4	36	1/4-20	3/16	Steel	McMaster	**6236K125**
3/4	40	1/4-20	3/16	Steel	McMaster	**6236K252**
3/4	45	1/4-20	3/16	Steel	McMaster	**6236K262**
3/4	48	1/4-20	3/16	Steel	McMaster	**6236K138**
3/4	54	1/4-20	3/16	Steel	McMaster	**2737T522**
3/4	60	1/4-20	3/16	Steel	McMaster	**6236K271**
3/4	72	1/4-20	3/16	Steel	McMaster	**2737T541**
7/8	15	1/4-20	3/16	Steel	McMaster	**6280K17**
7/8	16	1/4-20	3/16	Steel	McMaster	**6280K18**

#35 Sprockets Part Numbers

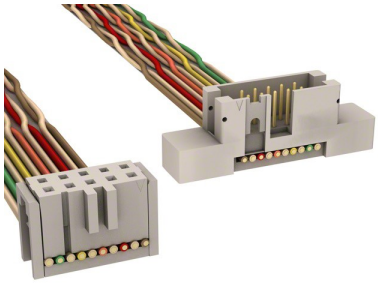
Bore	Teeth	Set Screw	Keyway	Material	Supplier	Part Number
7/8	17	1/4-20	3/16	Steel	McMaster	**6280K19**
7/8	18	1/4-20	3/16	Steel	McMaster	**6280K21**
7/8	19	1/4-20	3/16	Steel	McMaster	**6280K22**
7/8	20	1/4-20	3/16	Steel	McMaster	**6280K23**
7/8	21	1/4-20	3/16	Steel	McMaster	**6280K24**
7/8	22	1/4-20	3/16	Steel	McMaster	**6280K25**
7/8	23	1/4-20	3/16	Steel	McMaster	**6280K26**
7/8	24	1/4-20	3/16	Steel	McMaster	**6280K27**
7/8	25	1/4-20	3/16	Steel	McMaster	**6236K821**
7/8	26	1/4-20	3/16	Steel	McMaster	**6236K103**
7/8	28	1/4-20	3/16	Steel	McMaster	**6236K111**
7/8	30	1/4-20	3/16	Steel	McMaster	**6236K234**
7/8	32	1/4-20	3/16	Steel	McMaster	**6236K118**
7/8	35	1/4-20	3/16	Steel	McMaster	**6236K693**
7/8	36	1/4-20	3/16	Steel	McMaster	**6236K126**
7/8	40	1/4-20	3/16	Steel	McMaster	**6236K254**
7/8	45	1/4-20	3/16	Steel	McMaster	**6236K265**
7/8	48	1/4-20	3/16	Steel	McMaster	**6236K139**
7/8	54	1/4-20	3/16	Steel	McMaster	**2737T523**
7/8	60	1/4-20	3/16	Steel	McMaster	**6236K275**
7/8	72	1/4-20	3/16	Steel	McMaster	**2737T542**
1	15	5/16-18	1/4	Steel	Grainger	**36GA26**
1	15	5/16-18	1/4	Steel	McMaster	**6280K375**
1	16	5/16-18	1/4	Steel	Grainger	**36GA29**
1	16	5/16-18	1/4	Steel	McMaster	**6280K385**
1	17	5/16-18	1/4	Steel	Grainger	**36GA33**
1	17	5/16-18	1/4	Steel	McMaster	**6280K395**
1	18	5/16-18	1/4	Steel	Grainger	**6L806**
1	18	5/16-18	1/4	Steel	McMaster	**6280K405**
1	19	5/16-18	1/4	Steel	Grainger	**36GA38**
1	19	5/16-18	1/4	Steel	McMaster	**6280K413**
1	20	5/16-18	1/4	Steel	Grainger	**6L814**
1	20	5/16-18	1/4	Steel	McMaster	**6280K423**
1	21	5/16-18	1/4	Steel	McMaster	**6280K433**
1	22	5/16-18	1/4	Steel	McMaster	**6280K443**
1	23	5/16-18	1/4	Steel	McMaster	**6280K453**
1	24	5/16-18	1/4	Steel	Grainger	**6L830**
1	24	5/16-18	1/4	Steel	McMaster	**6280K463**
1	25	5/16-18	1/4	Steel	Grainger	**6L834**
1	25	5/16-18	1/4	Steel	McMaster	**6236K223**
1	26	5/16-18	1/4	Steel	McMaster	**6236K104**
1	28	5/16-18	1/4	Steel	Grainger	**36GA47**

#35 Sprockets Part Numbers

Bore	Teeth	Set Screw	Keyway	Material	Supplier	Part Number
1	28	5/16-18	1/4	Steel	McMaster	**6236K112**
1	30	5/16-18	1/4	Steel	McMaster	**6236K233**
1	32	5/16-18	1/4	Steel	McMaster	**6236K119**
1	35	5/16-18	1/4	Steel	McMaster	**6236K694**
1	36	5/16-18	1/4	Steel	McMaster	**6236K127**
1	40	5/16-18	1/4	Steel	McMaster	**6236K253**
1	48	5/16-18	1/4	Steel	McMaster	**6236K141**
1	54	5/16-18	1/4	Steel	McMaster	**2737T524**
1	60	5/16-18	1/4	Steel	McMaster	**6236K272**
1	72	5/16-18	1/4	Steel	McMaster	**2737T543**
1 1/16	26	5/16-18	1/4	Steel	McMaster	**6236K106**
1 1/8	26	5/16-18	1/4	Steel	McMaster	**6236K105**
1 1/8	28	5/16-18	1/4	Steel	McMaster	**6236K113**
1 1/8	30	5/16-18	1/4	Steel	McMaster	**6236K236**
1 1/8	32	5/16-18	1/4	Steel	McMaster	**6236K121**
1 1/8	35	5/16-18	1/4	Steel	McMaster	**6236K695**
1 1/8	36	5/16-18	1/4	Steel	McMaster	**6236K128**
1 1/8	40	5/16-18	1/4	Steel	McMaster	**6236K255**
1 1/8	45	5/16-18	1/4	Steel	McMaster	**6236K266**
1 1/8	48	5/16-18	1/4	Steel	McMaster	**6236K142**
1 1/8	60	5/16-18	1/4	Steel	McMaster	**6236K276**
1 3/16	26	5/16-18	1/4	Steel	McMaster	**6236K824**
1 3/16	28	5/16-18	1/4	Steel	McMaster	**6236K114**
1 3/16	30	5/16-18	1/4	Steel	McMaster	**6236K237**
1 3/16	32	5/16-18	1/4	Steel	McMaster	**6236K122**
1 3/16	35	5/16-18	1/4	Steel	McMaster	**6236K696**
1 3/16	36	5/16-18	1/4	Steel	McMaster	**6236K129**
1 3/16	40	5/16-18	1/4	Steel	McMaster	**6236K256**
1 3/16	45	5/16-18	1/4	Steel	McMaster	**6236K267**
1 3/16	48	5/16-18	1/4	Steel	McMaster	**6236K143**
1 3/16	60	5/16-18	1/4	Steel	McMaster	**6236K277**
1 1/4	26	5/16-18	1/4	Steel	McMaster	**6236K107**
1 1/4	28	5/16-18	1/4	Steel	McMaster	**6236K115**
1 1/4	30	5/16-18	1/4	Steel	McMaster	**6236K238**
1 1/4	32	5/16-18	1/4	Steel	McMaster	**6236K123**
1 1/4	35	5/16-18	1/4	Steel	McMaster	**6236K697**
1 1/4	36	5/16-18	1/4	Steel	McMaster	**6236K131**
1 1/4	40	5/16-18	1/4	Steel	McMaster	**6236K257**
1 1/4	45	5/16-18	1/4	Steel	McMaster	**6236K268**
1 1/4	48	5/16-18	1/4	Steel	McMaster	**6236K144**
1 1/4	54	5/16-18	1/4	Steel	McMaster	**2737T525**
1 1/4	60	5/16-18	1/4	Steel	McMaster	**6236K273**

#35 Sprockets Part Numbers

Bore	Teeth	Set Screw	Keyway	Material	Supplier	Part Number
1 1/4	72	5/16-18	1/4	Steel	McMaster	**2737T544**
1 3/8	54	3/8-16	5/16	Steel	McMaster	**2737T526**
1 3/8	72	3/8-16	5/16	Steel	McMaster	**2737T545**
1 1/2	54	3/8-16	3/8	Steel	McMaster	**2737T527**
1 1/2	72	3/8-16	3/8	Steel	McMaster	**2737T546**



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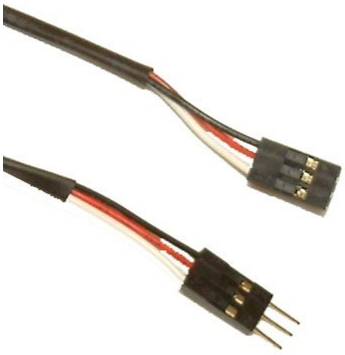


Cables/Wires

Arduino Programmer Cable

The Arduino Programmer Cable is used to load code onto AndyMark Ethernet Microcontrollers. The Ethernet Microcontrollers do not have a serial converter on board, so the cord converts the signal for it. The cord requires drivers, which can be found through the AndyMark page for the cord.

PRIOR USAGE

Not a Robot Part

Category

Supplier*

am-2416

Part Number

FINAL NOTES

The drivers can be somewhat hard to find: …

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CAN Wire

CAN Wire is used to connect the RoboRIO to the PDP, PCMs, Talon SRXs, SD540Cs, HERO Boards and other CAN-controlled devices. CAN-controlled devices are able to send data back to the RoboRIO unlike PWM devices. CAN Wire is made of two 22 AWG wires (one insulated green, one yellow) twisted together. High is yellow, low is green. Be sure the colors are not mixed up. VEX sells 25' lengths of CAN wire at a price cheaper than any other supplier I have found.

PRIOR USAGE

Electronics Board | Recyclops | 2015

CAN Wire was used on Recyclops to connect the RoboRIO to the PCM and PDP.

Electronics Board | Sparky | 2016

CAN Wire was used on Sparky to connect the RoboRIO to the drivetrain Talon SRXs and PDP.

Electronics Board | Heart of the Beast | 2017

CAN Wire was used on the Heart of the Beast to connect the RoboRIO to the drivetrain Talon SRXs, shooter Talon SRX, PDP, and later the PCM.

Electronics Board | Sparky (Testing) | 2017

CAN Wire was also used on Sparky to connect the RoboRIO to the PCM during testing between the Lake Superior regional and the 10,000 Lakes regional.

Category

Supplier*

217-4773

Part Number

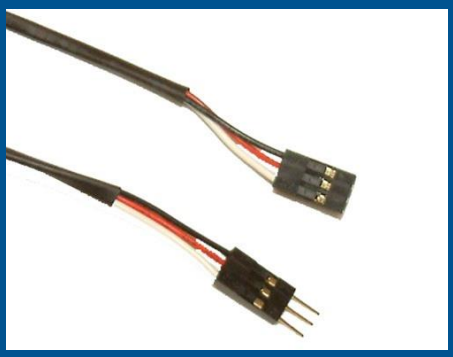
FINAL NOTES

When creating a CAN Bus, be sure to include terminating resistors on both end. The RoboRIO has one, so that is automatically an end. The PDP has one, but it can be turned off by switching the jumper next to the CAN ports to 'off'. CTR-Electronics' Hero Board has a terminating resistor built-in. CAN Wire can be connected with butt splice connectors or CAN Connectors.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PWM Cable

PWM Cables are used to transmit signals with pulse-width modulation. The most common use is connecting a PWM motor controller (Talon/Talon SR, Victor 884/888/SP, etc.) to a RoboRIO PWM port. Preassembled cables are easy to use, but custom length cables can save space by not having any excess to be bundled.



PRIOR USAGE

Every time a PWM motor controller was used and a few other times.

Category

Supplier*

Wiki

See Next Page

Part Number

FINAL NOTES

AndyMark's preassembled cables use heat shrink tubing rather than fusing the insulation together. AndyMark also sells supplies to create custom-length cables.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PWM Cable Part Numbers

Pre-Assembled Cables

Type	Length	Part Number
MF	12"	**am-0693**
MF	24"	**am-0694**
MF	36"	**am-0695**
MM	24"	**am-0944**
FF	12"	**276-2395 (VEX EDR)**
MMF	8"	**am-2261**
MMF	24"	**am-2581**

Pre-Assembled Cable Sets

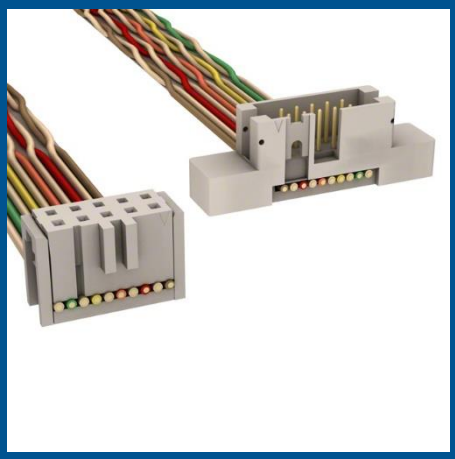
Type	Length	Part Number
MF	5x 12", 24", & 36"	**am-2217**
MF	10x 12", 24", & 36"	**am-2218**

Cable Components

Part	Part Number
PWM Cable Making Kit*	**am-2868**
PWM Male Connector	**am-0943**
PWM Female Connector	**am-2814**
Male to Male Adapter	**am-0913**
22AWG PWM Cable	**am-3162**
PWM Crimp Tool	**am-2672**

SPI Cable (5')

This SPI cable is useful when connecting to a sensor via SPI that doesn't work well where the RoboRIO is currently located (i.e. a gyro on a vertically oriented RoboRIO will not work).



PRIOR USAGE

Electronics Board | Heart of the Beast | 2017

A 5' SPI cable was used to connect the ADXRS450 Gyro to the RoboRIO so the gyro could be in a better position in the robot.

Category

Supplier*

M3CWK-1060K-ND

Part Number

FINAL NOTES

5' is more than enough to get anywhere on the robot. Zip tie the flanges on the female end to secure it.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

SPI Cable (6")

This SPI cable is useful as a short extender. With a 5' cable, this probably will not be necessary, but it is useful to have.

PRIOR USAGE

Not Used

Category

Supplier*

M3BRK-1006R-ND

Part Number

FINAL NOTES

Short extension cable. Be sure that the male end is plugged in correctly, there is no flange. If it doesn't work, flip it around.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX Data Cable

PRIOR USAGE

Category

Supplier*

217-4358
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX Data Cable Header

PRIOR USAGE

Category

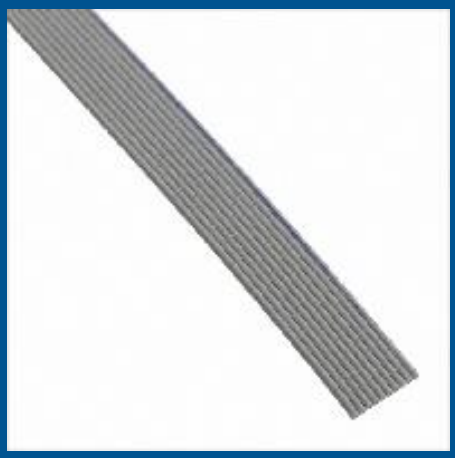
Supplier*

1175-1645-ND
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX Data Cable Ribbon Cable



PRIOR USAGE

Category

Supplier*

ME10G-100-ND
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Wire

Wire is used in every robot to transfer electrical power from the battery to individual components. 10AWG wire is used for parts that will require a large amount of power, such as the drivetrain. 14AWG wire is used for lower power subsystems. 18AWG wire is used mainly for power connections to the core control system. 18AWG wire can be used with the screw terminals on the RoboRIO and Barrel Connector. 20AWG wire is used for signal wires and low-power subsystems like LEDs.

PRIOR USAGE

Everywhere

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

McMaster-Carr sells wire in 11 colors (Black, Blue, Brown, Gray, Green, Green/Yellow, Orange, Purple, Red, White, Yellow) and in rolls of 25, 50, 100, 200 or 500 feet. Stranded wire is flexible and is sufficient for most purposes. In a few cases, solid wire is used because it will keep its shape when bent.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Wire Part Numbers

Stranded Wire

Gauge	Part Number
10AWG	**8054T19**
12AWG	**8054T18**
14AWG	**8054T17**
16AWG	**8054T16**
18AWG	**8054T15**
20AWG	**8054T14**
22AWG	**8054T13**
24AWG	**8054T12**
26AWG	**8054T11**
28AWG	**8054T31**

Solid Wire

Gauge	Part Number
18AWG	**8251T4**
20AWG	**8251T3**
22AWG	**8251T2**
24AWG	**8251T1**

CS

Control System Parts

Ethernet Microcontroller

The Ethernet Microcontroller is used to control small, non-essential subsystems like LEDs. The controller runs on Arduino code created in and uploaded by the Arduino IDE.

PRIOR USAGE

LEDs | Heart of the Beast | 2017

The LEDs that were added to the Heart of the Beast after the end of the 2017 competition season were controlled by an ethernet microcontroller. The controller received instructions from the RoboRIO via DIO.

Category

Supplier*

am-2287

Part Number

FINAL NOTES

This microcontroller is similar to an Arduino, but requires a special cable to program it. Thus, Arduinos may be a better option.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Network Switch

This Network Switch allows multiple ethernet cords to be connected to the RoboRIO without any difficult connections. It takes a 5V input, which can be provided by the 5V/2A port on the VRM. In an update to the rules in 2017, FIRST legalized connecting the RoboRIO to the radio through the network switch.

PRIOR USAGE

Electronics Board | Heart of the Beast | 2017

This network switch was used to simplify code uploads and to, at first, connect an additional coprocessor to the RoboRIO.

CS

Category

FIRST Choice Powered by **AndyMark**

Supplier*

N/A

Part Number

FINAL NOTES

This is a very handy component and as long as it is available from FIRST Choice, I advise procuring it.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

OM5P-AC

The OM5P-AC radio was introduced in 2017 as a replacement for the OM5P-AN radio that was ruled illegal to sell by a new regulation that was put in place. Both were legal for use in the 2017 Season.

During configuration (2017), you are able to add a robot name. This can be useful when you will be having multiple robots running simultaneously and need to know which robot you are connecting to.

PRIOR USAGE

Electronics Board | Heart of the Beast | 2017

The Heart of the Beast used a OM5P-AC radio to get instructions from the driver station.

Category

Supplier*

Wiki

am-3205

Part Number

FINAL NOTES

When reprogramming the radio, follow all of the steps there. Be sure that all wireless and wired network cards are disabled except for the ethernet card you are using. If configuration still fails, follow the instructions to reimage the radio. Be sure to select either 2.4GHz Access Point or 2.4GHz + 5GHz AP as the mode. The radio should be "OpenMesh".

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

OM5P-AN

The OM5P-AN radio was used in the 2016-7 FRC Seasons. It is currently not available for purchase (due to new FCC regulations in 2016), and has been replaced by the OM5P-AC. Both were legal in the 2017 Season.

During configuration (2017), you are able to add a robot name. This can be useful when you will be having multiple robots running simultaneously and need to know which robot you are connecting to.

PRIOR USAGE

Electronics Board | Sparky | 2016-2017

Sparky used a OM5P-AN radio to get instructions from the driver station.

Category

Supplier*

Wiki

N/A

Part Number

FINAL NOTES

When reprogramming the radio, follow all of the steps there. Be sure that all wireless and wired network cards are disabled except for the ethernet card you are using. If configuration still fails, follow the instructions to reimage the radio. Be sure to select either 2.4GHz Access Point or 2.4GHz + 5GHz AP as the mode. The radio should be "OpenMesh".

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Pneumatics Control Module (PCM)

The PCM controls pneumatic components, as the name suggests. It has Weidmuller ports to power eight solenoids (or four double solenoids). The compressor and pressure switch are connected directly to the PCM. The PCM gets signals from the RoboRIO via CAN. It can run solenoids at 12 or 24 volts, the jumper in the middle will need to be changed to switch voltages. Default is 12V. It gets power from a dedicated port on the PDP. The PCM replaces the use of Spike relays to control pneumatic solenoids and compressors.

PRIOR USAGE

Electronics Board | Recyclops | 2015

Recyclops had a PCM controlling its pneumatics system.

Electronics Board | Heart of the Beast | 2017

The Heart of the Beast had a PCM controlling its pneumatic system.

Category

Supplier*

Wiki

am-2858

Part Number

FINAL NOTES

The PCM makes controlling pneumatics much easier than in years before 2015. There are only eight ports, so you can only have so many solenoids before you need Spike relays or another PCM (powered by regular PDP ports). Double solenoids take two ports. Be sure that polarity is correct, especially for the compressor. The pressure switch has no preferred polarity.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Power Distribution Panel (PDP)

The PDP is a required part of FRC control systems from 2015 and later. It has eight large Wago connector pairs and 8 small Wago connector pairs. The larger connectors use the 40A breakers, the smaller connectors can use 5A, 10A, 20A or 30A breakers. Drive train motor controllers should probably be connected to 40A connectors. The PDP must be connected via CAN Bus to the RoboRIO. This can go through other CAN devices. Either CAN connector pair can be used. Match the wire color to the color next to the connector. The PDP has a terminating resistor that ends the CAN Bus. This can be changed by switching the jumper next to the CAN connectors and terminating the CAN Bus elsewhere. There is a designated port for the RoboRIO and two designated ports for the VRM and PCM. Additional VRMs or PCMs must be connected to regular Wago connectors.

Category

Supplier*

Wiki

am-2856

Part Number

PRIOR USAGE

Electronics Board | Recyclops | 2015

Recyclops used a PDP.

Electronics Board | Sparky | 2016

Sparky used a PDP.

Electronics Board | Heart of the Beast | 2017

The Heart of the Beast used a PDP.

FINAL NOTES

If you want to power your robot, use a PDP. Otherwise, don't bother. Be sure to follow all wire size rules in the manual. Each wire gauge has a maximum amperage rating set by FIRST and the breaker for that wire pair must be rated at or below this rating. When connecting the battery cables, be sure to use the split washers to ensure a consistent secure connection.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

RoboRIO

The RoboRIO is the controller on any FRC robot from 2015 and later. It has PWM, CAN, DIO, Analog, USB, Ethernet, I²C, SPI and RS-232 ports, a special port for the RSL, and a MXP breakout port. It can be programmed in LabVIEW, C++, Java or Python. The power connection is a screw terminal. If the robot stops responding for 15-20 seconds, check this power connection first.

PRIOR USAGE

Electronics Board | Recyclops | 2015

Recyclops was the first robot made by team 2855 to use a RoboRIO as its controller.

Electronics Board | Sparky | 2016

Sparky used the RoboRIO as its controller.

Electronics Board | Heart of the Beast | 2017

The Heart of the Beast used a RoboRIO as its controller.

Category

Supplier*

Wiki

am-3000

Part Number

FINAL NOTES

The RoboRIO is a required part of the FRC control system. Red power wire is above the black power wire. White wires go to the S pin. Don't lose the power connector!

* This is who team 2855 usually purchases this part from. There may be other suppliers of this part.

Robot Signal Light (RSL)

The Robot Signal Light (originally called the Panel Signal Device) tells everyone what the robot is currently doing. Steady means the robot is powered but disabled, flashing means it's enabled. If it is off, you either didn't turn the robot on or didn't plug the RSL in properly. To wire it, connect the black wire to the N terminal, the red wire to the Lb terminal, and a jumper between the La and Lb terminals. The black wire should then be connected to the pin near the outside of the RoboRIO.

PRIOR USAGE

The RSL has been used on all FRC robots since 2009.

Category

Supplier*

Kit of Parts

Wiki

N/A

Part Number

FINAL NOTES

Though AndyMark now sells the RSL, we get one in the Kit of Parts every year so we don't need to buy more. A simple mounting technique is to take a pillow block bearing (provided in the Kit of Parts), take out the plastic part, put the RSL into the bearing holder, and use the screw on the RSL to hold the bearing holder in place. Zip ties can then be used to attach it to the robot.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Spike H-Bridge Relay

Spike H-Bridge Relays are used as a simple-ish on-off switch. There are different ways for it to output power which are changed within the robot code. The Spike Relay has been discontinued and may not be legal in the future, especially if a newer relay enters FRC.

PRIOR USAGE

Category

Supplier*

Wiki

N/A

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Voltage Regulator Module (VRM)

The VRM is a required part of FRC control systems from 2015 and later. It is used to supply power to the radio (D-Link in 2015, OM5P-AN in 2016 & 2017 and OM5P-AC in 2017). The 2016/7 radios connect to the 12V/2A Weidmuller connectors. Do not connect anything else to these ports, the rating is for both ports combined (and it is against the rules). The other ports can be used to power other electronic components or sensors.

PRIOR USAGE

Electronics Board | Recyclops | 2015

Recyclops used a VRM to power its D-Link radio, which was connected to the 5V/2A port.

Electronics Board | Sparky | 2016

Sparky used a VRM to power its OM5P-AN radio, which was connected to the 12V/2A port.

Electronics Board | Heart of the Beast | 2017

The Heart of the Beast used a VRM to power its OM5P-AC radio, which was connected to the 12V/2A port. The D-Link network switch was connected to the 5V/500mA port.

Category

Supplier*

Wiki

am-2857

Part Number

FINAL NOTES

The VRM is handy when you find a sensor requiring 5V or 12V. If you come across a VRM that has a sticker that reads "Radio", DO NOT LISTEN TO IT. Those were from 2015 when the radios used the 5V/2A port. Remove that sticker. And remember that the rating is for both Weidmuller ports combined.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

E

Electrical Parts

Barrel Connector

AndyMark's barrel connector is used to connect power to the radio (OM5P-AN/AC, D-Link), Network Switch, or Ethernet Microcontroller. Essentially, anything that uses a 2.1 x 5.5mm barrel connector. The wires are connected to the connector with screw terminals. 18 AWG wire is recommended.

PRIOR USAGE

Electronics Board | The Heart of the Beast | 2017

This connector was used to connect power to the Ethernet Microcontroller that was supposed to control the LED strips.

Electronics Board | Sparky (Testing) | 2017

This connector was used to connect power to the Ethernet Microcontroller that controlled the CMUcam5 (Pixy) and a short strip of LEDs during testing between the Lake Superior regional and 10,000 Lakes regional.

Category

Supplier*

am-2922

Part Number

FINAL NOTES

Using this connector allows you to leave the wall brick connected to the original connector, allowing you to connect the device to an outlet for configuration. Be sure that the other end of the wire is connected to the correct voltage and amperage port.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

BattHawk

The BattHawk is a major improvement over the old AndyMark battery flags. This flag will show the voltage of a battery without draining the battery. This gives a quick glance at what the most charged battery is without checking each with a Battery Beak. A voltage over 13 is considered acceptable for competition, and over 12V for practice.

PRIOR USAGE

Not a Robot Part

E

Category

AndyMark

Supplier*

am-3824_4

Part Number

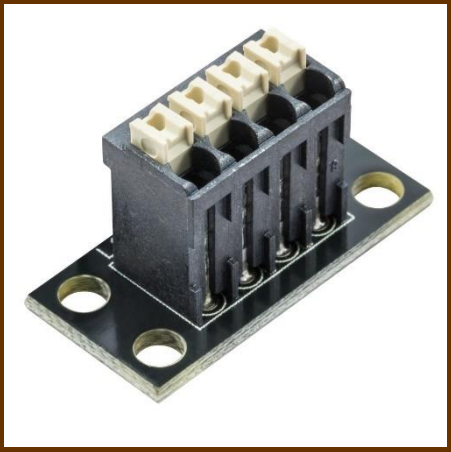
FINAL NOTES

This is not a replacement for a Battery Beak. Batteries should be checked with a Battery Beak when the charger says they are full, then the BattHawk should be inserted into the battery connector. They are sold in 4-packs.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CAN Connector

The CAN Connector can be used to connect CAN wires without using butt splice connectors. They come in packs of 5. The ports are Weidmuller connectors.



PRIOR USAGE

Not Used

Category

Supplier*

217-4429

Part Number

FINAL NOTES

When connecting the wires, it does not matter which color is hi or low, only that the same color is connected to both hi or both low ports. But, connecting yellow to hi and green to low will speed up inspection.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CANifier

The CANifier converts CAN signals to IO for PWM and even LED strips. Sensors, LED strips and other PWM devices can be controlled via CAN.

PRIOR USAGE

Not Used

Category

Supplier*

am-3780

Part Number

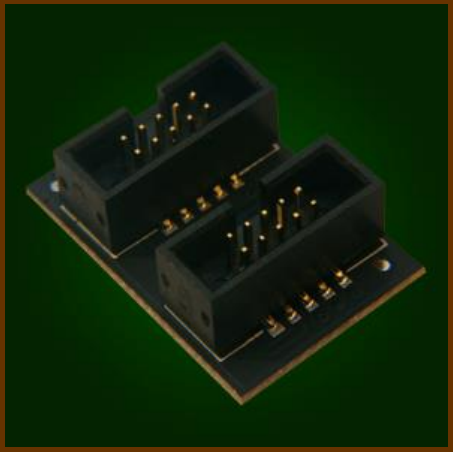
FINAL NOTES

The connections require soldering. CAN H/L and power are connected via solder pads. All other signals are through-hole connections.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Data Cable Extender

This Data Cable Extender is used to extend the length of a Talon SRX Data Cable. Just plug one end of one cable into one port and one end of the other cable into the other port and you now have a longer cable.



PRIOR USAGE

Not Used

Category

Supplier*

15-686788

Part Number

FINAL NOTES

These may be useful, but it may be a better investment to buy bulk cable and connectors and make our own custom-length cables.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

HYLUG Compression Terminal

PRIOR USAGE

Category

Supplier*

am-0805

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

LED Connectors, 10mm, 3-Pin

These connectors connect to LED strips with three pins (Power, Signal, Ground). The other end can be connected to 20AWG wire to connect them to the Arduino that controls the LEDs.

PRIOR USAGE

Robot | Heart of the Beast | 2017

Connectors similar to these were used to connect to the LED strips used on the Heart of the Beast. The difference between those and these is that those had the colors of the wires in a different order than the strip.

Category

Supplier*

B01MYA8D6P

Part Number

FINAL NOTES

Always check which wires correspond with each pin, as the colors may or may not align correctly. It may be helpful to strip the wires a little more than they are. The LED strip's casing must be removed for these to fit.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

LED Strip, Individually Addressable

This LED strip has 150 individually addressable LEDs, at a density of 60 per meter. It can be cut at junctions and a connector can be used to easily connect to the new segment without requiring soldering. The power must be converted to 5V, which can be done by an AndyMark power converter (am-3068), an old radio power converter, the VRM, or by the Arduino if the segment is short. Keep in mind how many amps you require when deciding which of the aforementioned converters (listed in order of highest to lowest amperage) to use. When using a connector, be sure to check the strip when connecting the wires, as the colors of the connector's wires may not correspond to the strip.

PRIOR USAGE

Robot | Heart of the Beast | 2017

After the season was completed, LEDs were successfully added to the Heart of the Beast's shooter and intake.

Category

Supplier*

am-2916

Part Number

FINAL NOTES

These LEDs can be controlled by an Arduino running the NeoPixel library. The FastLED library can be used for advanced animations. For tips on how to wire and code the LEDs, look up the Adafruit NeoPixel Überguide. Other suggestions are to add a 1000µF 6.3+V capacitor across the power connector and a 300-500Ω Resistor on each data line.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Main Breaker, 120A

This 120A circuit breaker is the main on-off switch for the robot. To complete the circuit (turn the robot on), push the small reset lever back into the housing. To open the circuit (turn the robot off), completely depress the red button. This switch is placed along the positive (red) cable between the battery and the PDP.

PRIOR USAGE

This has been used as the main on-off switch for every FRC robot since 2003.

Category

Supplier*

am-0282

Part Number

FINAL NOTES

When tightening the nuts that hold the ring connectors on the wires in place, make sure they are VERY tight and that the wires CANNOT be moved from side to side AT ALL. Keep the circuit breaker in a protected, yet easily accessible location, because a light tap to the red button can restart a robot (like what happened to team 4188 in 2017 Houston Einstein Finals Match 2).

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Passive POE Injector

This Passive Power Over Ethernet (POE) Injector is the solution to all problems associated with the power jack on the radios. The radios have supported POE, but only teams able to create their own or find a passive POE injector were able to utilize it. The power connector is plugged into one input while the other is plugged into the RoboRIO or network switch. An ethernet cord is then connected between the radio and the injector.

PRIOR USAGE

Not Used

Category

Supplier*

am-3766

Part Number

FINAL NOTES

This is a very, very good and cheap investment. Power issues are common in FRC and most have to do with the radio power connector coming loose. This allows the barrel connection to be more secure and for the connection at the radio to have a clip holding it in.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Power Converter (12/24-5VDC)

PRIOR USAGE

Category

Supplier*

am-3068

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PWM Extension Retaining Clip

These retaining clips will hold two 2- or 3-wire cables together. This is a much more practical solution than electrical tape.

PRIOR USAGE

Not Used

Category

Supplier*

276-4128

Part Number

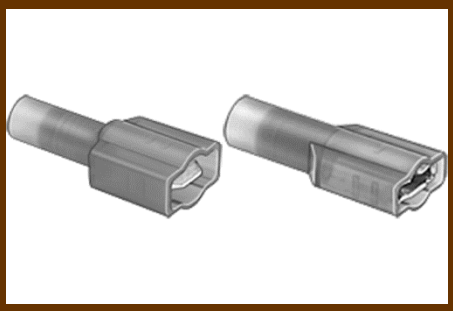
FINAL NOTES

These come in packs of 10 and are a cheap and good investment.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Quick-Disconnect Terminal

Quick-Disconnect Terminals are usually used for power connections between the PDP and motor controller and the motor controller and motor. This allows the connection to be removed in case the motor or motor controller needs to be replaced.



PRIOR USAGE

Used for many electrical connections.

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

Quick-Disconnect Terminals are useful for larger wire connections, if they are crimped correctly. Smaller data connections, like CAN wire, can use splice connectors instead.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Quick-Disconnect Terminal Part Numbers

Female Connectors

Gauge (AWG)	Qty./Pkg.	Part Number
26-24	25	**7243K46**
26-22	10	**4916K81**
22-18	50	**7243K11**
16-14	50	**7243K21**
12-10	25	**7243K31**

Male Connectors

Gauge (AWG)	Qty./Pkg.	Part Number
22-18	50	**7243K12**
16-14	50	**7243K22**
12-10	25	**7243K32**

Snap Action Breaker, 5A

Snap Action Breakers are used in the PDP to keep devices from getting too much amperage. Usually this would happen if there is a short somewhere. The 5 amp breaker is the lowest amperage breaker available for the smaller Wago connectors.

PRIOR USAGE

Not Used

Category

Supplier*

am-2096

Part Number

FINAL NOTES

5 amps is a very low amperage for a FRC breaker. This is very rarely used.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Snap Action Breaker, 10A

Snap Action Breakers are used in the PDP to keep devices from getting too much amperage. Usually this would happen if there is a short somewhere. The 10 amp breaker is the second lowest amperage breaker available for the smaller Wago connectors.

PRIOR USAGE

Not Used

Category

Supplier*

am-2097

Part Number

FINAL NOTES

10 amps is also a very low amperage for a FRC breaker. This is rarely used.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Snap Action Breaker, 20A

Snap Action Breakers are used in the PDP to keep devices from getting too much amperage. Usually this would happen if there is a short somewhere. The 20 amp breaker is the one of the common breakers used with the smaller wago connectors and is provided in the KoP. This is the highest amperage breaker allowed to be used for fans, Spike relays, extra PCMs and VRMs. Wires used with this breaker must be 18 AWG or larger (2017 rules).

PRIOR USAGE

Electrical Board | Heart of the Beast | 2017

20A breakers were used to power two Spikes that each controlled a LED ring.

Category

Supplier*

am-0289

Part Number

FINAL NOTES

The 20 amp breaker is commonly used, usually when there are no 30A breakers left, or the devices powered are limited to 20A.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Snap Action Breaker, 30A

Snap Action Breakers are used in the PDP to keep devices from getting too much amperage. Usually this would happen if there is a short somewhere. The 30 amp breaker is the highest amperage breaker available and one of the common breakers used with the smaller wago connectors and is provided in the KoP. Wires used with this breaker must be 14 AWG or larger (2017 rules).

PRIOR USAGE

Electrical Board | Sparky | 2016

30A breakers were used to power the intake Talon SR and the arm SPIKE.

Electrical Board | Heart of the Beast | 2017

30A breakers were used to power the original gear mechanism's SPIKE, the climber Talon SR and the intake Talon SR.

Category

Supplier*

am-0290

Part Number

FINAL NOTES

The 30 amp breaker is commonly used, usually if there are no large Wago connectors left.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Snap Action Breaker, 40A

Snap Action Breakers are used in the PDP to keep devices from getting too much amperage. Usually this would happen if there is a short somewhere. The 40 amp breaker is the only breaker available for the larger wago connectors and is provided in the KoP. Wires used with this breaker must be 12 AWG or larger (2017 rules).

PRIOR USAGE

Electrical Board | Sparky | 2016

40A breakers were used to power the four drive train Talon SRXs.

Electrical Board | Heart of the Beast | 2017

40A breakers were used to power the six drive train Talon SRXs and the shooter Talon SRX.

Category

Supplier*

am-0288

Part Number

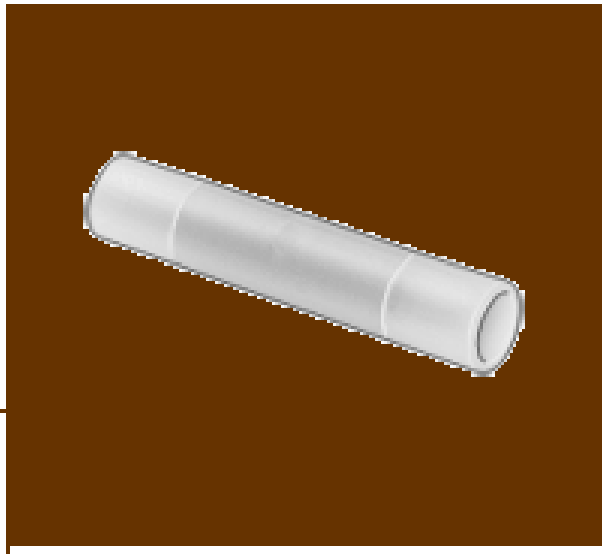
FINAL NOTES

The 40 amp breaker is commonly used for drive train motors and sometimes other subsystems. Drive train controllers should be connected to 40A breakers when possible.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Splice (Butt) Connector

Splice connectors are used to connect two wires that will not be separated in the future. One example would be a CAN bus, where the Talon SRXs have built-in CAN wires that must be connected somehow.



PRIOR USAGE

Category

Supplier*

To Be Included in Future Version

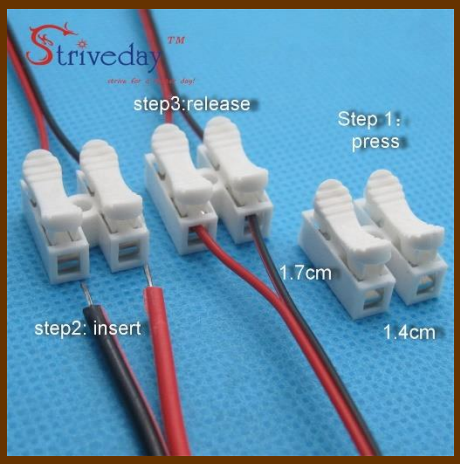
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Spring Connector, 2-Way

These Spring Connectors are like terminal blocks. They are good for connecting small wires.



PRIOR USAGE

Not Used

Category

Supplier*

B01KT91OEW

Part Number

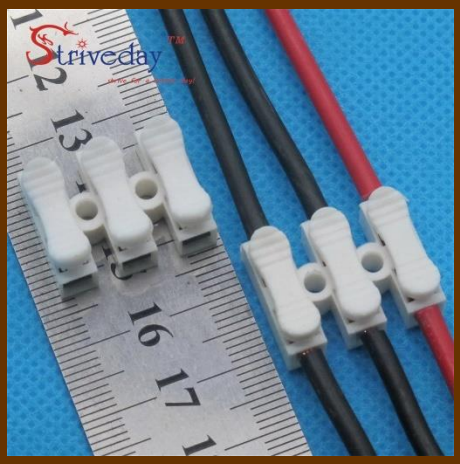
FINAL NOTES

Only use these for non-essential systems, like LEDs.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Spring Connector, 3-Way

These Spring Connectors are like terminal blocks. They are good for connecting small wires.



PRIOR USAGE

Not Used

Category

Supplier*

B01KT91U32

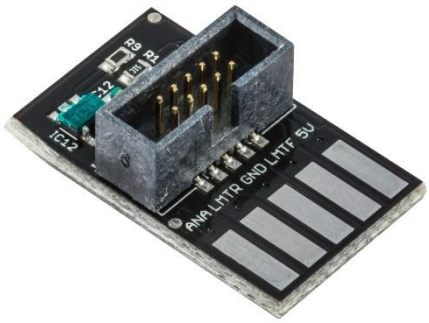
Part Number

FINAL NOTES

Only use these for non-essential systems, like LEDs.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX Analog Breakout



PRIOR USAGE

Category

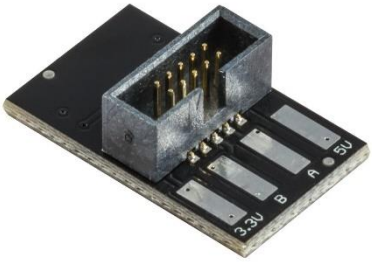
Supplier*

217-4401
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX Encoder Breakout Board



PRIOR USAGE

Category

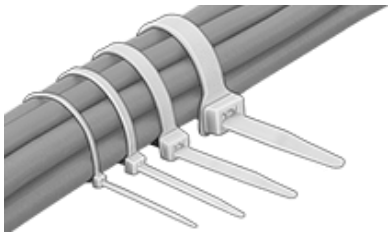
Supplier*

217-4398
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

F/C



Fasteners

Connectors

500EX Hex Hub

The AndyMark 500EX Hex Hub is useful for connecting sprockets to shafts. The six screw holes are used to connect to the sprocket. They can also be used as live axle wheel hubs.

PRIOR USAGE

Arm | Sparky | 2016

A hex hub was used to connect the arm shaft to the motor driving the arm. Later, three more hex hubs were added to transfer power between the shaft and arm after the two 3D-printed parts wore out.

Robot | Heart of the Beast | 2017

Hex hubs were used in multiple places, such as the intake and climber. *Note: add more accurate data*

F/C

Category

AndyMark

Supplier*

am-2568

Part Number

FINAL NOTES

Hex hubs are very useful when transferring power from a chain or belt to a shaft. Because it is hex, it does not require a machine key.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

500EX Key Hub

The AndyMark 500EX Key Hub is used mainly as a wheel and pulley hub. These work with 1/2" shafts and 1/8" keys.

PRIOR USAGE

Drivetrain | Heart of the Beast | 2017

The output shafts for the four Toughbox Mini gearboxes each had a 39 tooth pulley attached, which each used a 500EX Key Hub.

F/C

Category

AndyMark

Supplier*

am-0976

Part Number

FINAL NOTES

The 39 Tooth Pulley (am-2361) uses a 500EX Key Hub.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

REV 1" Linear Motion Kit

The REV Linear Motion Kit works with REV 1" extrusion to create a telescoping arm or lift.

PRIOR USAGE

Not Used

F/C

Category

REV ROBOTICS

Supplier*

REV-15-1189

Part Number

FINAL NOTES

See documentation for assembly instructions. There is a kit for a two-stage lift (REV-25-1238) and a third-stage extension (REV-25-1239) available to create a simple lift system.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

REV 15mm Linear Motion Kit

The REV Linear Motion Kit works with REV 15mm extrusion to create a telescoping arm or lift.

PRIOR USAGE

Not Used

F/C

Category

AndyMark

Supplier*

am-3246

Part Number

FINAL NOTES

See documentation for assembly instructions.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Rigid Shaft Coupling

Rigid Shaft Couplings are useful when connecting two shafts together. If rotational power will be transferred between the shafts, the coupling should have a keyway. If there is some misalignment between the shafts, a beam, bellows, disc or Oldham coupling is more suitable. If shock absorption is desired, a jaw or Oldham coupling is more suitable.

F/C

Category

Supplier*

See Next 6 Pages

Part Number

PRIOR USAGE

Shooter | Heart of the Beast | 2017

The Heart of the Beast's shooter had a MCLC-8-8-F coupling transferring power from the 8mm VersaPlanetary gearbox output shaft to the 8mm shaft with the shooter wheels on it.

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber used a CLC-8-8-F coupling to transfer power between the 1/2" BaneBots 256:1 P60 output shaft and a CIMple output shaft that was connected to the climber shaft via chain.

FINAL NOTES

Shaft couplers are very useful when connecting shafts together, specifically when you cannot use only one shaft (i.e. gearbox to mechanism shaft). Most of Ruland's products are available from them through Amazon with cheaper prices that are usually also on sale. Just search for the part number and "shaft coupling" and it should come up. Steel is the cheapest material and should be sufficient for FRC applications.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ruland Rigid Shaft Couplings Part Numbers

One-Piece Rigid Coupling

Inch Bores

Bore 1	Bore 2	Material	Part Number
1/8	1/8	Steel[1]	**CLX-2-2-F**
1/8	1/8	Aluminum	**CLX-2-2-A**
1/8	1/8	Stainless Steel	**CLX-2-2-SS**
3/16	3/16	Steel	**CLX-3-3-F**
3/16	3/16	Aluminum	**CLX-3-3-A**
3/16	3/16	Stainless Steel	**CLX-3-3-SS**
1/4	3/16	Steel	**CLX-4-3-F**
1/4	3/16	Aluminum	**CLX-4-3-A**
1/4	3/16	Stainless Steel	**CLX-4-3-SS**
1/4	1/4	Steel	**CLX-4-4-F**
1/4	1/4	Aluminum	**CLX-4-4-A**
1/4	1/4	Stainless Steel	**CLX-4-4-SS**
5/16	5/16	Steel	**CLX-5-5-F**
5/16	5/16	Aluminum	**CLX-5-5-A**
5/16	5/16	Stainless Steel	**CLX-5-5-SS**
3/8	1/4	Steel	**CLX-6-4-F**
3/8	1/4	Aluminum	**CLX-6-4-A**
3/8	1/4	Stainless Steel	**CLX-6-4-SS**
3/8	3/8	Steel	**CLX-6-6-F**
3/8	3/8	Aluminum	**CLX-6-6-A**
3/8	3/8	Stainless Steel	**CLX-6-6-SS**
1/2	3/8	Steel	**CLX-8-6-F**
1/2	3/8	Aluminum	**CLX-8-6-A**
1/2	3/8	Stainless Steel	**CLX-8-6-SS**
1/2	1/2	Steel	**CLX-8-8-F**
1/2	1/2	Aluminum	**CLX-8-8-A**
1/2	1/2	Stainless Steel	**CLX-8-8-SS**
5/8	1/2	Steel	**CLX-10-8-F**
5/8	1/2	Aluminum	**CLX-10-8-A**
5/8	1/2	Stainless Steel	**CLX-10-8-SS**
5/8	5/8	Steel	**CLX-10-10-F**
5/8	5/8	Aluminum	**CLX-10-10-A**
5/8	5/8	Stainless Steel	**CLX-10-10-SS**
3/4	1/2	Steel	**CLX-12-8-F**
3/4	1/2	Stainless Steel	**CLX-12-8-SS**
3/4	5/8	Steel	**CLX-12-10-F**
3/4	5/8	Stainless Steel	**CLX-12-10-SS**
3/4	3/4	Steel	**CLX-12-12-F**
3/4	3/4	Stainless Steel	**CLX-12-12-SS**
7/8	5/8	Steel	**CLX-14-10-F**
7/8	5/8	Stainless Steel	**CLX-14-10-SS**
7/8	7/8	Steel	**CLX-14-14-F**
7/8	7/8	Stainless Steel	**CLX-14-14-SS**
1	1/2	Steel	**CLX-16-8-F**
1	1/2	Stainless Steel	**CLX-16-8-SS**
1	5/8	Steel	**CLX-16-10-F**
1	5/8	Stainless Steel	**CLX-16-10-SS**
1	3/4	Steel	**CLX-16-12-F**
1	3/4	Stainless Steel	**CLX-16-12-SS**
1	1	Steel	**CLX-16-16-F**
1	1	Stainless Steel	**CLX-16-16-SS**
1 1/8	1	Steel	**CLX-18-16-F**
1 1/8	1	Stainless Steel	**CLX-18-16-SS**
1 1/8	1 1/8	Steel	**CLX-18-18-F**
1 1/8	1 1/8	Stainless Steel	**CLX-18-18-SS**
1 3/16	1 3/16	Steel	**CLX-19-19-F**
1 3/16	1 3/16	Stainless Steel	**CLX-19-19-SS**
1 1/4	1	Steel	**CLX-20-16-F**
1 1/4	1	Stainless Steel	**CLX-20-16-SS**
1 1/4	1 1/4	Steel	**CLX-20-20-F**
1 1/4	1 1/4	Stainless Steel	**CLX-20-20-SS**
1 3/8	1	Steel	**CLX-22-16-F**
1 3/8	1	Stainless Steel	**CLX-22-16-SS**
1 3/8	1 3/8	Steel	**CLX-22-22-F**
1 3/8	1 3/8	Stainless Steel	**CLX-22-22-SS**
1 7/16	1	Steel	**CLX-23-16-F**
1 7/16	1	Stainless Steel	**CLX-23-16-SS**
1 7/16	1 7/16	Steel	**CLX-23-23-F**
1 7/16	1 7/16	Stainless Steel	**CLX-23-23-SS**
1 1/2	1	Steel	**CLX-24-16-F**
1 1/2	1	Stainless Steel	**CLX-24-16-SS**
1 1/2	1 1/4	Steel	**CLX-24-20-F**
1 1/2	1 1/4	Stainless Steel	**CLX-24-20-SS**
1 1/2	1 1/2	Steel	**CLX-24-24-F**
1 1/2	1 1/2	Stainless Steel	**CLX-24-24-SS**
1 3/4	1 3/4	Steel	**CLX-28-28-F**
1 3/4	1 3/4	Stainless Steel	**CLX-28-28-SS**
1 15/16	1 15/16	Steel	**CLX-31-31-F**
1 15/16	1 15/16	Stainless Steel	**CLX-31-31-SS**
2	2	Steel	**CLX-32-32-F**
2	2	Stainless Steel	**CLX-32-32-SS**

One-Piece Rigid Coupling

Metric Bores

Bore 1	Bore 2	Material	Part Number
3	3	Steel	**MCLX-3-3-F**
3	3	Aluminum	**MCLX-3-3-A**
3	3	Stainless Steel	**MCLX-3-3-SS**
4	4	Steel	**MCLX-4-4-F**
4	4	Aluminum	**MCLX-4-4-A**

[1] Sometimes listed as Black Oxide Steel

Ruland Rigid Shaft Couplings Part Numbers

Bore 1	Bore 2	Material	Part Number
4	4	Stainless Steel	**MCLX-4-4-SS**
5	4	Steel	**MCLX-5-4-F**
5	4	Stainless Steel	**MCLX-5-4-SS**
5	5	Steel	**MCLX-5-5-F**
5	5	Aluminum	**MCLX-5-5-A**
5	5	Stainless Steel	**MCLX-5-5-SS**
6	6	Steel	**MCLX-6-6-F**
6	6	Aluminum	**MCLX-6-6-A**
6	6	Stainless Steel	**MCLX-6-6-SS**
8	6	Steel	**MCLX-8-6-F**
8	6	Stainless Steel	**MCLX-8-6-SS**
8	8	Steel	**MCLX-8-8-F**
8	8	Aluminum	**MCLX-8-8-A**
8	8	Stainless Steel	**MCLX-8-8-SS**
10	6	Steel	**MCLX-10-6-F**
10	6	Stainless Steel	**MCLX-10-6-SS**
10	8	Steel	**MCLX-10-8-F**
10	8	Stainless Steel	**MCLX-10-8-SS**
10	10	Steel	**MCLX-10-10-F**
10	10	Aluminum	**MCLX-10-10-A**
10	10	Stainless Steel	**MCLX-10-10-SS**
12	8	Steel	**MCLX-12-8-F**
12	8	Stainless Steel	**MCLX-12-8-SS**
12	10	Steel	**MCLX-12-10-F**
12	10	Stainless Steel	**MCLX-12-10-SS**
12	12	Steel	**MCLX-12-12-F**
12	12	Aluminum	**MCLX-12-12-A**
12	12	Stainless Steel	**MCLX-12-12-SS**
14	14	Steel	**MCLX-14-14-F**
14	14	Stainless Steel	**MCLX-14-14-SS**
15	14	Steel	**MCLX-15-14-F**
15	14	Stainless Steel	**MCLX-15-14-SS**
15	15	Steel	**MCLX-15-15-F**
15	15	Stainless Steel	**MCLX-15-15-SS**
16	14	Steel	**MCLX-16-14-F**
16	14	Stainless Steel	**MCLX-16-14-SS**
16	16	Steel	**MCLX-16-16-F**
16	16	Stainless Steel	**MCLX-16-16-SS**
20	12	Steel	**MCLX-20-12-F**
20	12	Stainless Steel	**MCLX-20-12-SS**
20	16	Steel	**MCLX-20-16-F**
20	16	Stainless Steel	**MCLX-20-16-SS**
20	20	Steel	**MCLX-20-20-F**
20	20	Stainless Steel	**MCLX-20-20-SS**
25	20	Steel	**MCLX-25-20-F**
25	20	Stainless Steel	**MCLX-25-20-SS**
25	25	Steel	**MCLX-25-25-F**
25	25	Stainless Steel	**MCLX-25-25-SS**
30	25	Steel	**MCLX-30-25-F**
30	25	Stainless Steel	**MCLX-30-25-SS**
30	30	Steel	**MCLX-30-30-F**
30	30	Stainless Steel	**MCLX-30-30-SS**
35	35	Steel	**MCLX-35-35-F**
35	35	Stainless Steel	**MCLX-35-35-SS**
40	40	Steel	**MCLX-40-40-F**
40	40	Stainless Steel	**MCLX-40-40-SS**
50	50	Steel	**MCLX-50-50-F**
50	50	Stainless Steel	**MCLX-50-50-SS**

One-Piece Rigid Coupling with Keyway

Inch Bores

Bore[2]	Keyway	Material	Part Number
3/8	3/32	Steel	**CLC-6-6-F**
3/8	3/32	Stainless Steel	**CLC-6-6-SS**
1/2	1/8	Steel	**CLC-8-8-F**
1/2	1/8	Stainless Steel	**CLC-8-8-SS**
5/8	3/16	Steel	**CLC-10-10-F**
5/8	3/16	Stainless Steel	**CLC-10-10-SS**
3/4	3/16	Steel	**CLC-12-12-F**
3/4	3/16	Stainless Steel	**CLC-12-12-SS**
7/8	3/16	Steel	**CLC-14-14-F**
7/8	3/16	Stainless Steel	**CLC-14-14-SS**
1	1/4	Steel	**CLC-16-16-F**
1	1/4	Stainless Steel	**CLC-16-16-SS**
1 1/8	1/4	Steel	**CLC-18-18-F**
1 1/8	1/4	Stainless Steel	**CLC-18-18-SS**
1 3/16	1/4	Steel	**CLC-19-19-F**
1 3/16	1/4	Stainless Steel	**CLC-19-19-SS**
1 1/4	1/4	Steel	**CLC-20-20-F**
1 1/4	1/4	Stainless Steel	**CLC-20-20-SS**
1 3/8	5/16	Steel	**CLC-22-22-F**
1 3/8	5/16	Stainless Steel	**CLC-22-22-SS**
1 7/16	3/8	Steel	**CLC-23-23-F**
1 7/16	3/8	Stainless Steel	**CLC-23-23-SS**
1 1/2	3/8	Steel	**CLC-24-24-F**
1 1/2	3/8	Stainless Steel	**CLC-24-24-SS**
1 3/4	3/8	Steel	**CLC-28-28-F**
1 3/4	3/8	Stainless Steel	**CLC-28-28-SS**
1 15/16	1/2	Steel	**CLC-31-31-F**
1 15/16	1/2	Stainless Steel	**CLC-31-31-SS**
2	1/2	Steel	**CLC-32-32-F**
2	1/2	Stainless Steel	**CLC-32-32-SS**

[2] One Piece Rigid Couplings with Keyways have the same bore on both sides. For a coupling with different bores, use a Two Piece Rigid Coupling

Ruland Rigid Shaft Couplings Part Numbers

One-Piece Rigid Coupling with Keyway

Metric Bores

Bore[3]	Keyway	Material	Part Number
8	2	Steel	**MCLC-8-8-F**
8	2	Stainless Steel	**MCLC-8-8-SS**
10	3	Steel	**MCLC-10-10-F**
10	3	Stainless Steel	**MCLC-10-10-SS**
12	4	Steel	**MCLC-12-12-F**
12	4	Stainless Steel	**MCLC-12-12-SS**
14	5	Steel	**MCLC-14-14-F**
14	5	Stainless Steel	**MCLC-14-14-SS**
15	5	Steel	**MCLC-15-15-F**
15	5	Stainless Steel	**MCLC-15-15-SS**
16	5	Steel	**MCLC-16-16-F**
16	5	Stainless Steel	**MCLC-16-16-SS**
20	6	Steel	**MCLC-20-20-F**
20	6	Stainless Steel	**MCLC-20-20-SS**
25	8	Steel	**MCLC-25-25-F**
25	8	Stainless Steel	**MCLC-25-25-SS**
30	8	Steel	**MCLC-30-30-F**
30	8	Stainless Steel	**MCLC-30-30-SS**
35	10	Steel	**MCLC-35-35-F**
35	10	Stainless Steel	**MCLC-35-35-SS**
40	12	Steel	**MCLC-40-40-F**
40	12	Stainless Steel	**MCLC-40-40-SS**
50	14	Steel	**MCLC-50-50-F**
50	14	Stainless Steel	**MCLC-50-50-SS**

Two-Piece Rigid Coupling

Inch Bores

Bore 1	Bore 2	Material	Part Number
1/8	1/8	Steel	**SPX-2-2-F**
1/8	1/8	Stainless Steel	**SPX-2-2-SS**
3/16	3/16	Steel	**SPX-3-3-F**
3/16	3/16	Stainless Steel	**SPX-3-3-SS**
1/4	3/16	Steel	**SPX-4-3-F**
1/4	3/16	Stainless Steel	**SPX-4-3-SS**
1/4	1/4	Steel	**SPX-4-4-F**
1/4	1/4	Stainless Steel	**SPX-4-4-SS**
3/8	1/4	Steel	**SPX-6-4-F**
3/8	1/4	Stainless Steel	**SPX-6-4-SS**
3/8	3/8	Steel	**SPX-6-6-F**
3/8	3/8	Stainless Steel	**SPX-6-6-SS**
1/2	3/8	Steel	**SPX-8-6-F**
1/2	3/8	Stainless Steel	**SPX-8-6-SS**
1/2	1/2	Steel	**SPX-8-8-F**
1/2	1/2	Stainless Steel	**SPX-8-8-SS**
5/8	1/2	Steel	**SPX-10-8-F**
5/8	1/2	Stainless Steel	**SPX-10-8-SS**
5/8	5/8	Steel	**SPX-10-10-F**
5/8	5/8	Stainless Steel	**SPX-10-10-SS**
3/4	1/2	Steel	**SPX-12-8-F**
3/4	1/2	Stainless Steel	**SPX-12-8-SS**
3/4	5/8	Steel	**SPX-12-10-F**
3/4	5/8	Stainless Steel	**SPX-12-10-SS**
3/4	3/4	Steel	**SPX-12-12-F**
3/4	3/4	Stainless Steel	**SPX-12-12-SS**
7/8	5/8	Steel	**SPX-14-10-F**
7/8	5/8	Stainless Steel	**SPX-14-10-SS**
7/8	7/8	Steel	**SPX-14-14-F**
7/8	7/8	Stainless Steel	**SPX-14-14-SS**
1	1/2	Steel	**SPX-16-8-F**
1	1/2	Stainless Steel	**SPX-16-8-SS**
1	5/8	Steel	**SPX-16-10-F**
1	5/8	Stainless Steel	**SPX-16-10-SS**
1	3/4	Steel	**SPX-16-12-F**
1	3/4	Stainless Steel	**SPX-16-12-SS**
1	1	Steel	**SPX-16-16-F**
1	1	Stainless Steel	**SPX-16-16-SS**
1 1/8	1	Steel	**SPX-18-16-F**
1 1/8	1	Stainless Steel	**SPX-18-16-SS**
1 1/8	1 1/8	Steel	**SPX-18-18-F**
1 1/8	1 1/8	Stainless Steel	**SPX-18-18-SS**
1 3/16	1	Steel	**SPX-19-16-F**
1 3/16	1	Stainless Steel	**SPX-19-16-SS**
1 3/16	1 3/16	Steel	**SPX-19-19-F**
1 3/16	1 3/16	Stainless Steel	**SPX-19-19-SS**
1 1/4	1	Steel	**SPX-20-16-F**
1 1/4	1	Stainless Steel	**SPX-20-16-SS**
1 1/4	1 1/4	Steel	**SPX-20-20-F**
1 1/4	1 1/4	Stainless Steel	**SPX-20-20-SS**
1 3/8	1	Steel	**SPX-22-16-F**
1 3/8	1	Stainless Steel	**SPX-22-16-SS**
1 3/8	1 3/8	Steel	**SPX-22-22-F**
1 3/8	1 3/8	Stainless Steel	**SPX-22-22-SS**
1 7/16	1	Steel	**SPX-23-16-F**
1 7/16	1	Stainless Steel	**SPX-23-16-SS**
1 7/16	1 7/16	Steel	**SPX-23-23-F**
1 7/16	1 7/16	Stainless Steel	**SPX-23-23-SS**
1 1/2	1	Steel	**SPX-24-16-F**
1 1/2	1	Stainless Steel	**SPX-24-16-SS**
1 1/2	1 1/4	Steel	**SPX-24-20-F**

[3] One Piece Rigid Couplings with Keyways have the same bore on both sides. For a coupling with different bores, use a Two Piece Rigid Coupling

Ruland Rigid Shaft Couplings Part Numbers

Bore 1	Bore 2	Material	Part Number
1 1/2	1 1/4	Stainless Steel	**SPX-24-20-SS**
1 1/2	1 1/2	Steel	**SPX-24-24-F**
1 1/2	1 1/2	Stainless Steel	**SPX-24-24-SS**
1 3/4	1 3/4	Steel	**SPX-28-28-F**
1 3/4	1 3/4	Stainless Steel	**SPX-28-28-SS**
1 15/16	1 15/16	Steel	**SPX-31-31-F**
1 15/16	1 15/16	Stainless Steel	**SPX-31-31-SS**
2	2	Steel	**SPX-32-32-F**
2	2	Stainless Steel	**SPX-32-32-SS**

Two-Piece Rigid Coupling

Metric Bores

Bore 1	Bore 2	Material	Part Number
3	3	Steel	**MSPX-3-3-F**
3	3	Stainless Steel	**MSPX-3-3-SS**
4	4	Steel	**MSPX-4-4-F**
4	4	Stainless Steel	**MSPX-4-4-SS**
5	5	Steel	**MSPX-5-5-F**
5	5	Stainless Steel	**MSPX-5-5-SS**
6	6	Steel	**MSPX-6-6-F**
6	6	Stainless Steel	**MSPX-6-6-SS**
8	8	Steel	**MSPX-8-8-F**
8	8	Stainless Steel	**MSPX-8-8-SS**
10	10	Steel	**MSPX-10-10-F**
10	10	Stainless Steel	**MSPX-10-10-SS**
12	12	Steel	**MSPX-12-12-F**
12	12	Stainless Steel	**MSPX-12-12-SS**
14	14	Steel	**MSPX-14-14-F**
14	14	Stainless Steel	**MSPX-14-14-SS**
15	14	Steel	**MSPX-15-14-F**
15	14	Stainless Steel	**MSPX-15-14-SS**
15	15	Steel	**MSPX-15-15-F**
15	15	Stainless Steel	**MSPX-15-15-SS**
16	14	Steel	**MSPX-16-14-F**
16	14	Stainless Steel	**MSPX-16-14-SS**
16	16	Steel	**MSPX-16-16-F**
16	16	Stainless Steel	**MSPX-16-16-SS**
20	20	Steel	**MSPX-20-20-F**
20	20	Stainless Steel	**MSPX-20-20-SS**
25	25	Steel	**MSPX-25-25-F**
25	25	Stainless Steel	**MSPX-25-25-SS**
30	30	Steel	**MSPX-30-30-F**
30	30	Stainless Steel	**MSPX-30-30-SS**
35	35	Steel	**MSPX-35-35-F**
35	35	Stainless Steel	**MSPX-35-35-SS**
40	40	Steel	**MSPX-40-40-F**
40	40	Stainless Steel	**MSPX-40-40-SS**
50	50	Steel	**MSPX-50-50-F**
50	50	Stainless Steel	**MSPX-50-50-SS**

Two-Piece Rigid Coupling with Keyway

Inch Bores

Bore 1	Bore 2	Material	Part Number
3/8	1/4	Steel	**SPC-6-4-F**
3/8	1/4	Stainless Steel	**SPC-6-4-SS**
3/8	3/8	Steel	**SPC-6-6-F**
3/8	3/8	Stainless Steel	**SPC-6-6-SS**
1/2	3/8	Steel	**SPC-8-6-F**
1/2	3/8	Stainless Steel	**SPC-8-6-SS**
1/2	1/2	Steel	**SPC-8-8-F**
1/2	1/2	Stainless Steel	**SPC-8-8-SS**
5/8	1/2	Steel	**SPC-10-8-F**
5/8	1/2	Stainless Steel	**SPC-10-8-SS**
5/8	5/8	Steel	**SPC-10-10-F**
5/8	5/8	Stainless Steel	**SPC-10-10-SS**
3/4	1/2	Steel	**SPC-12-8-F**
3/4	1/2	Stainless Steel	**SPC-12-8-SS**
3/4	5/8	Steel	**SPC-12-10-F**
3/4	5/8	Stainless Steel	**SPC-12-10-SS**
3/4	3/4	Steel	**SPC-12-12-F**
3/4	3/4	Stainless Steel	**SPC-12-12-SS**
7/8	5/8	Steel	**SPC-14-10-F**
7/8	5/8	Stainless Steel	**SPC-14-10-SS**
7/8	7/8	Steel	**SPC-14-14-F**
7/8	7/8	Stainless Steel	**SPC-14-14-SS**
1	1/2	Steel	**SPC-16-8-F**
1	1/2	Stainless Steel	**SPC-16-8-SS**
1	5/8	Steel	**SPC-16-10-F**
1	5/8	Stainless Steel	**SPC-16-10-SS**
1	3/4	Steel	**SPC-16-12-F**
1	3/4	Stainless Steel	**SPC-16-12-SS**
1	1	Steel	**SPC-16-16-F**
1	1	Stainless Steel	**SPC-16-16-SS**
1 1/8	1	Steel	**SPC-18-16-F**
1 1/8	1	Stainless Steel	**SPC-18-16-SS**
1 1/8	1 1/8	Steel	**SPC-18-18-F**
1 1/8	1 1/8	Stainless Steel	**SPC-18-18-SS**
1 3/16	1	Steel	**SPC-19-16-F**
1 3/16	1	Stainless Steel	**SPC-19-16-SS**
1 3/16	1 3/16	Steel	**SPC-19-19-F**
1 3/16	1 3/16	Stainless Steel	**SPC-19-19-SS**
1 1/4	1	Steel	**SPC-20-16-F**
1 1/4	1	Stainless Steel	**SPC-20-16-SS**
1 1/4	1 1/4	Steel	**SPC-20-20-F**
1 1/4	1 1/4	Stainless Steel	**SPC-20-20-SS**
1 3/8	1	Steel	**SPC-22-16-F**
1 3/8	1	Stainless Steel	**SPC-22-16-SS**
1 3/8	1 3/8	Steel	**SPC-22-22-F**
1 3/8	1 3/8	Stainless Steel	**SPC-22-22-SS**
1 7/16	1	Steel	**SPC-23-16-F**
1 7/16	1	Stainless Steel	**SPC-23-16-SS**
1 7/16	1 7/16	Steel	**SPC-23-23-F**
1 7/16	1 7/16	Stainless Steel	**SPC-23-23-SS**

Ruland Rigid Shaft Couplings Part Numbers

Bore 1	Bore 2	Material	Part Number
1 1/2	1	Steel	**SPC-24-16-F**
1 1/2	1	Stainless Steel	**SPC-24-16-SS**
1 1/2	1 1/4	Steel	**SPC-24-20-F**
1 1/2	1 1/4	Stainless Steel	**SPC-24-20-SS**
1 1/2	1 1/2	Steel	**SPC-24-24-F**
1 1/2	1 1/2	Stainless Steel	**SPC-24-24-SS**
1 3/4	1 3/4	Steel	**SPC-28-28-F**
1 3/4	1 3/4	Stainless Steel	**SPC-28-28-SS**
1 15/16	1 15/16	Steel	**SPC-31-31-F**
1 15/16	1 15/16	Stainless Steel	**SPC-31-31-SS**
2	2	Steel	**SPC-32-32-F**
2	2	Stainless Steel	**SPC-32-32-SS**

Two-Piece Rigid Coupling with Keyway

Metric Bores

Bore 1	Bore 2	Material	Part Number
8	8	Steel	**MSPC-8-8-F**
8	8	Stainless Steel	**MSPC-8-8-SS**
10	10	Steel	**MSPC-10-10-F**
10	10	Stainless Steel	**MSPC-10-10-SS**
12	8	Steel	**MSPC-12-8-F**
12	8	Stainless Steel	**MSPC-12-8-SS**
12	10	Steel	**MSPC-12-10-F**
12	10	Stainless Steel	**MSPC-12-10-SS**
12	12	Steel	**MSPC-12-12-F**
12	12	Stainless Steel	**MSPC-12-12-SS**
14	12	Steel	**MSPC-14-12-F**
14	12	Stainless Steel	**MSPC-14-12-SS**
14	14	Steel	**MSPC-14-14-F**
14	14	Stainless Steel	**MSPC-14-14-SS**
15	10	Steel	**MSPC-15-10-F**
15	10	Stainless Steel	**MSPC-15-10-SS**
15	14	Steel	**MSPC-15-14-F**
15	14	Stainless Steel	**MSPC-15-14-SS**
15	15	Steel	**MSPC-15-15-F**
15	15	Stainless Steel	**MSPC-15-15-SS**
16	14	Steel	**MSPC-16-14-F**
16	14	Stainless Steel	**MSPC-16-14-SS**
16	16	Steel	**MSPC-16-16-F**
16	16	Stainless Steel	**MSPC-16-16-SS**
20	16	Steel	**MSPC-20-16-F**
20	16	Stainless Steel	**MSPC-20-16-SS**
20	20	Steel	**MSPC-20-20-F**
20	20	Stainless Steel	**MSPC-20-20-SS**
25	25	Steel	**MSPC-25-25-F**
25	25	Stainless Steel	**MSPC-25-25-SS**
30	30	Steel	**MSPC-30-30-F**
30	30	Stainless Steel	**MSPC-30-30-SS**
35	35	Steel	**MSPC-35-35-F**
35	35	Stainless Steel	**MSPC-35-35-SS**
40	40	Steel	**MSPC-40-40-F**
40	40	Stainless Steel	**MSPC-40-40-SS**
50	50	Steel	**MSPC-50-50-F**
50	50	Stainless Steel	**MSPC-50-50-SS**

Set Screw Rigid Coupling

Inch Bores

Bore	Material	Part Number
1/4	Steel	**SCX-4-4-F**
1/4	Stainless Steel	**SCX-4-4-SS**
3/8	Steel	**SCX-6-6-F**
3/8	Stainless Steel	**SCX-6-6-SS**
1/2	Steel	**SCX-8-8-F**
1/2	Stainless Steel	**SCX-8-8-SS**
5/8	Steel	**SCX-10-10-F**
5/8	Stainless Steel	**SCX-10-10-SS**
3/4	Steel	**SCX-12-12-F**
3/4	Stainless Steel	**SCX-12-12-SS**
7/8	Steel	**SCX-14-14-F**
7/8	Stainless Steel	**SCX-14-14-SS**
1	Steel	**SCX-16-16-F**
1	Stainless Steel	**SCX-16-16-SS**
1 1/8	Steel	**SCX-18-18-F**
1 1/8	Stainless Steel	**SCX-18-18-SS**
1 1/4	Steel	**SCX-20-20-F**
1 1/4	Stainless Steel	**SCX-20-20-SS**
1 3/8	Steel	**SCX-22-22-F**
1 3/8	Stainless Steel	**SCX-22-22-SS**
1 1/2	Steel	**SCX-24-24-F**
1 1/2	Stainless Steel	**SCX-24-24-SS**
1 3/4	Steel	**SCX-28-28-F**
1 3/4	Stainless Steel	**SCX-28-28-SS**
2	Steel	**SCX-32-32-F**
2	Stainless Steel	**SCX-32-32-SS**

Set Screw Rigid Coupling

Metric Bores

Bore	Material	Part Number
6	Steel	**MSCX-6-6-F**
6	Stainless Steel	**MSCX-6-6-SS**
8	Steel	**MSCX-8-8-F**
8	Stainless Steel	**MSCX-8-8-SS**
10	Steel	**MSCX-10-10-F**
10	Stainless Steel	**MSCX-10-10-SS**
12	Steel	**MSCX-12-12-F**
12	Stainless Steel	**MSCX-12-12-SS**
14	Steel	**MSCX-14-14-F**
14	Stainless Steel	**MSCX-14-14-SS**
16	Steel	**MSCX-16-16-F**

Ruland Rigid Shaft Couplings Part Numbers

Bore	Material	Part Number
16	Stainless Steel	**MSCX-16-16-SS**
20	Steel	**MSCX-20-20-F**
20	Stainless Steel	**MSCX-20-20-SS**
25	Steel	**MSCX-25-25-F**
25	Stainless Steel	**MSCX-25-25-SS**
30	Steel	**MSCX-30-30-F**
30	Stainless Steel	**MSCX-30-30-SS**
35	Steel	**MSCX-35-35-F**
35	Stainless Steel	**MSCX-35-35-SS**
40	Steel	**MSCX-40-40-F**
40	Stainless Steel	**MSCX-40-40-SS**
50	Steel	**MSCX-50-50-F**
50	Stainless Steel	**MSCX-50-50-SS**

Set Screw Rigid Coupling with Keyway

Inch Bores

Bore	Material	Part Number
3/8	Steel	**SCC-6-6-F**
3/8	Stainless Steel	**SCC-6-6-SS**
1/2	Steel	**SCC-8-8-F**
1/2	Stainless Steel	**SCC-8-8-SS**
5/8	Steel	**SCC-10-10-F**
5/8	Stainless Steel	**SCC-10-10-SS**
3/4	Steel	**SCC-12-12-F**
3/4	Stainless Steel	**SCC-12-12-SS**
7/8	Steel	**SCC-14-14-F**
7/8	Stainless Steel	**SCC-14-14-SS**
1	Steel	**SCC-16-16-F**
1	Stainless Steel	**SCC-16-16-SS**
1 1/8	Steel	**SCC-18-18-F**
1 1/8	Stainless Steel	**SCC-18-18-SS**
1 1/4	Steel	**SCC-20-20-F**
1 1/4	Stainless Steel	**SCC-20-20-SS**
1 3/8	Steel	**SCC-22-22-F**
1 3/8	Stainless Steel	**SCC-22-22-SS**
1 1/2	Steel	**SCC-24-24-F**
1 1/2	Stainless Steel	**SCC-24-24-SS**
1 3/4	Steel	**SCC-28-28-F**
1 3/4	Stainless Steel	**SCC-28-28-SS**
2	Steel	**SCC-32-32-F**
2	Stainless Steel	**SCC-32-32-SS**

Set Screw Rigid Coupling with Keyway

Metric Bores

Bore	Material	Part Number
8	Steel	**MSCC-8-8-F**
8	Stainless Steel	**MSCC-8-8-SS**
10	Steel	**MSCC-10-10-F**
10	Stainless Steel	**MSCC-10-10-SS**
12	Steel	**MSCC-12-12-F**
12	Stainless Steel	**MSCC-12-12-SS**
14	Steel	**MSCC-14-14-F**
14	Stainless Steel	**MSCC-14-14-SS**
16	Steel	**MSCC-16-16-F**
16	Stainless Steel	**MSCC-16-16-SS**
20	Steel	**MSCC-20-20-F**
20	Stainless Steel	**MSCC-20-20-SS**
25	Steel	**MSCC-25-25-F**
25	Stainless Steel	**MSCC-25-25-SS**
30	Steel	**MSCC-30-30-F**
30	Stainless Steel	**MSCC-30-30-SS**
35	Steel	**MSCC-35-35-F**
35	Stainless Steel	**MSCC-35-35-SS**
40	Steel	**MSCC-40-40-F**
40	Stainless Steel	**MSCC-40-40-SS**
50	Steel	**MSCC-50-50-F**
50	Stainless Steel	**MSCC-50-50-SS**

Shaft Adapter, 8mm to 1/2 Hex

This adapter will transform any 8mm (CIM) shaft into a 1/2" hex shaft.

PRIOR USAGE

Not Used

F/C

Category

VEX PRO

Supplier*

217-3255

Part Number

FINAL NOTES

Use a 8mm retaining ring to keep the adapter on the shaft.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Collar

Shaft Collars are very useful on shafts because they can limit the movement of a part without using a plate, bearing and washer. They come in three main styles: one-piece clamping, two-piece clamping and set screw collars. One piece shaft collars slide onto the end of the shaft and are tightened on one side. Two-piece shaft collars can be taken apart and added to the shaft in between parts and are tightened on two sides, with the screws facing the same or opposite directions depending on the model. Set screw shaft collars have a screw that is tightened so it will grip the shaft. Set screw shaft collars tend to loosen under high torque and RPM. They also come in many types of bores and materials. There are circular bores, threaded bores, hex bores and more. They can be made from steel, zinc-plated steel, aluminum, two types of stainless steel or plastic. The materials available vary depending on which type of shaft collar is used. They come in inch and metric bores.

F/C

Category

Supplier*

See Next 23 Pages

Part Number

PRIOR USAGE

FINAL NOTES

If you are not getting a standard shaft collar that VEXpro carries, Ruland has the largest selection. Most of Ruland's products are available from them through Amazon with cheaper prices that are usually also on sale. Just search for the part number and "shaft collar" and it should come up. Steel is the cheapest material and should be sufficient for FRC applications.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ruland Shaft Collars Part Numbers

One Piece Clamping Shaft Collar

Inch Bores

Bore	Material	Part Number
1/8	Steel	**CL-2-F**
1/8	Zinc Plated Steel	**CL-2-FZ**
1/8	Aluminum	**CL-2-A**
1/8	303 Stainless Steel	**CL-2-SS**
1/8	316 Stainless Steel	**CL-2-ST**
1/8	Plastic	**CL-2-P**
3/16	Steel	**CL-3-F**
3/16	Zinc Plated Steel	**CL-3-FZ**
3/16	Aluminum	**CL-3-A**
3/16	303 Stainless Steel	**CL-3-SS**
3/16	316 Stainless Steel	**Cl-3-ST**
3/16	Plastic	**CL-3-P**
1/4	Steel	**CL-4-F**
1/4	Zinc Plated Steel	**CL-4-FZ**
1/4	Aluminum	**CL-4-A**
1/4	303 Stainless Steel	**CL-4-SS**
1/4	316 Stainless Steel	**CL-4-ST**
1/4	Plastic	**CL-4-P**
5/16	Steel	**CL-5-F**
5/16	Zinc Plated Steel	**CL-5-FZ**
5/16	Aluminum	**CL-5-A**
5/16	303 Stainless Steel	**CL-5-SS**
5/16	316 Stainless Steel	**CL-5-ST**
5/16	Plastic	**CL-5-P**
3/8	Steel	**CL-6-F**
3/8	Zinc Plated Steel	**CL-6-FZ**
3/8	Aluminum	**CL-6-A**
3/8	303 Stainless Steel	**CL-6-SS**
3/8	316 Stainless Steel	**CL-6-ST**
3/8	Plastic	**CL-6-P**
7/16	Steel	**CL-7-F**
7/16	Zinc Plated Steel	**CL-7-FZ**
7/16	Aluminum	**CL-7-A**
7/16	303 Stainless Steel	**CL-7-SS**
7/16	316 Stainless Steel	**CL-7-ST**
7/16	Plastic	**CL-7-P**
1/2	Steel	**CL-8-F**
1/2	Zinc Plated Steel	**CL-8-FZ**
1/2	Aluminum	**CL-8-A**
1/2	303 Stainless Steel	**CL-8-SS**
1/2	316 Stainless Steel	**CL-8-ST**
1/2	Plastic	**CL-8-P**

Bore	Material	Part Number
9/16	Steel	**CL-9-F**
9/16	Zinc Plated Steel	**CL-9-FZ**
9/16	Aluminum	**CL-9-A**
9/16	303 Stainless Steel	**CL-9-SS**
9/16	316 Stainless Steel	**CL-9-ST**
9/16	Plastic	**CL-9-P**
5/8	Steel	**CL-10-F**
5/8	Zinc Plated Steel	**CL-10-FZ**
5/8	Aluminum	**CL-10-A**
5/8	303 Stainless Steel	**CL-10-SS**
5/8	316 Stainless Steel	**CL-10-ST**
5/8	Plastic	**CL-10-P**
11/16	Steel	**CL-11-F**
11/16	Zinc Plated Steel	**CL-11-FZ**
11/16	Aluminum	**CL-11-A**
11/16	303 Stainless Steel	**CL-11-SS**
11/16	316 Stainless Steel	**CL-11-ST**
11/16	Plastic	**CL-11-P**
3/4	Steel	**CL-12-F**
3/4	Zinc Plated Steel	**CL-12-FZ**
3/4	Aluminum	**CL-12-A**
3/4	303 Stainless Steel	**CL-12-SS**
3/4	316 Stainless Steel	**CL-12-ST**
3/4	Plastic	**CL-12-P**
13/16	Steel	**CL-13-F**
13/16	Zinc Plated Steel	**CL-13-FZ**
13/16	Aluminum	**CL-13-A**
13/16	303 Stainless Steel	**CL-13-SS**
13/16	316 Stainless Steel	**CL-13-ST**
13/16	Plastic	**CL-13-P**
7/8	Steel	**CL-14-F**
7/8	Zinc Plated Steel	**CL-14-FZ**
7/8	Aluminum	**CL-14-A**
7/8	303 Stainless Steel	**CL-14-SS**
7/8	316 Stainless Steel	**CL-14-ST**
7/8	Plastic	**CL-14-P**
15/16	Steel	**CL-15-F**
15/16	Zinc Plated Steel	**CL-15-FZ**
15/16	Aluminum	**CL-15-A**
15/16	303 Stainless Steel	**CL-15-SS**
15/16	316 Stainless Steel	**CL-15-ST**
15/16	Plastic	**CL-15-P**
1	Steel	**CL-16-F**
1	Zinc Plated Steel	**CL-16-FZ**
1	Aluminum	**CL-16-A**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
1	303 Stainless Steel	**CL-16-SS**
1	316 Stainless Steel	**CL-16-ST**
1	Plastic	**CL-16-P**
1 1/16	Steel	**CL-17-F**
1 1/16	Zinc Plated Steel	**CL-17-FZ**
1 1/16	Aluminum	**CL-17-A**
1 1/16	303 Stainless Steel	**CL-17-SS**
1 1/16	316 Stainless Steel	**CL-17-ST**
1 1/16	Plastic	**CL-17-P**
1 1/8	Steel	**CL-18-F**
1 1/8	Zinc Plated Steel	**CL-18-FZ**
1 1/8	Aluminum	**CL-18-A**
1 1/8	303 Stainless Steel	**CL-18-SS**
1 1/8	316 Stainless Steel	**CL-18-ST**
1 1/8	Plastic	**CL-18-P**
1 3/16	Steel	**CL-19-F**
1 3/16	Zinc Plated Steel	**CL-19-FZ**
1 3/16	Aluminum	**CL-19-A**
1 3/16	303 Stainless Steel	**CL-19-SS**
1 3/16	316 Stainless Steel	**CL-19-ST**
1 3/16	Plastic	**CL-19-P**
1 1/4	Steel	**CL-20-F**
1 1/4	Zinc Plated Steel	**CL-20-FZ**
1 1/4	Aluminum	**CL-20-A**
1 1/4	303 Stainless Steel	**CL-20-SS**
1 1/4	316 Stainless Steel	**CL-20-ST**
1 1/4	Plastic	**CL-20-P**
1 5/16	Steel	**CL-21-F**
1 5/16	Zinc Plated Steel	**CL-21-FZ**
1 5/16	Aluminum	**CL-21-A**
1 5/16	303 Stainless Steel	**CL-21-SS**
1 5/16	316 Stainless Steel	**CL-21-ST**
1 5/16	Plastic	**CL-21-P**
1 3/8	Steel	**CL-22-F**
1 3/8	Zinc Plated Steel	**CL-22-FZ**
1 3/8	Aluminum	**CL-22-A**
1 3/8	303 Stainless Steel	**CL-22-SS**
1 3/8	316 Stainless Steel	**CL-22-ST**
1 3/8	Plastic	**CL-22-P**
1 7/16	Steel	**CL-23-F**
1 7/16	Zinc Plated Steel	**CL-23-FZ**
1 7/16	Aluminum	**CL-23-A**
1 7/16	303 Stainless Steel	**CL-23-SS**
1 7/16	316 Stainless Steel	**CL-23-ST**
1 7/16	Plastic	**CL-23-P**

Bore	Material	Part Number
1 1/2	Steel	**CL-24-F**
1 1/2	Zinc Plated Steel	**CL-24-FZ**
1 1/2	Aluminum	**CL-24-A**
1 1/2	303 Stainless Steel	**CL-24-SS**
1 1/2	316 Stainless Steel	**CL-24-ST**
1 1/2	Plastic	**CL-24-P**
1 9/16	Steel	**CL-25-F**
1 9/16	Zinc Plated Steel	**CL-25-FZ**
1 9/16	Aluminum	**CL-25-A**
1 9/16	303 Stainless Steel	**CL-25-SS**
1 9/16	316 Stainless Steel	**CL-25-ST**
1 5/8	Steel	**CL-26-F**
1 5/8	Zinc Plated Steel	**CL-26-FZ**
1 5/8	Aluminum	**CL-26-A**
1 5/8	303 Stainless Steel	**CL-26-SS**
1 5/8	316 Stainless Steel	**CL-26-ST**
1 11/16	Steel	**CL-27-F**
1 11/16	Zinc Plated Steel	**CL-27-FZ**
1 11/16	Aluminum	**CL-27-A**
1 11/16	303 Stainless Steel	**CL-27-SS**
1 11/16	316 Stainless Steel	**CL-27-ST**
1 3/4	Steel	**CL-28-F**
1 3/4	Zinc Plated Steel	**CL-28-FZ**
1 3/4	Aluminum	**CL-28-A**
1 3/4	303 Stainless Steel	**CL-28-SS**
1 3/4	316 Stainless Steel	**CL-28-ST**
1 13/16	Steel	**CL-29-F**
1 13/16	Zinc Plated Steel	**CL-29-FZ**
1 13/16	Aluminum	**CL-29-A**
1 13/16	303 Stainless Steel	**CL-29-SS**
1 13/16	316 Stainless Steel	**CL-29-ST**
1 7/8	Steel	**CL-30-F**
1 7/8	Zinc Plated Steel	**CL-30-FZ**
1 7/8	Aluminum	**CL-30-A**
1 7/8	303 Stainless Steel	**CL-30-SS**
1 7/8	316 Stainless Steel	**CL-30-ST**
1 15/16	Steel	**CL-31-F**
1 15/16	Zinc Plated Steel	**CL-31-FZ**
1 15/16	Aluminum	**CL-31-A**
1 15/16	303 Stainless Steel	**CL-31-SS**
1 15/16	316 Stainless Steel	**CL-31-ST**
2	Steel	**CL-32-F**
2	Zinc Plated Steel	**CL-32-FZ**
2	Aluminum	**CL-32-A**
2	303 Stainless Steel	**CL-32-SS**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
2	316 Stainless Steel	**CL-32-ST**
2 1/16	Steel	**CL-33-F**
2 1/16	Zinc Plated Steel	**CL-33-FZ**
2 1/16	Aluminum	**CL-33-A**
2 1/16	303 Stainless Steel	**CL-33-SS**
2 1/16	316 Stainless Steel	**CL-33-ST**
2 1/8	Steel	**CL-34-F**
2 1/8	Zinc Plated Steel	**CL-34-FZ**
2 1/8	Aluminum	**CL-34-A**
2 1/8	303 Stainless Steel	**CL-34-SS**
2 1/8	316 Stainless Steel	**CL-34-ST**
2 3/16	Steel	**CL-35-F**
2 3/16	Zinc Plated Steel	**CL-35-FZ**
2 3/16	Aluminum	**CL-35-A**
2 3/16	303 Stainless Steel	**CL-35-SS**
2 3/16	316 Stainless Steel	**CL-35-ST**
2 1/4	Steel	**CL-36-F**
2 1/4	Zinc Plated Steel	**CL-36-FZ**
2 1/4	Aluminum	**CL-36-A**
2 1/4	303 Stainless Steel	**CL-36-SS**
2 1/4	316 Stainless Steel	**CL-36-ST**
2 5/16	Steel	**CL-37-F**
2 5/16	Zinc Plated Steel	**CL-37-FZ**
2 5/16	Aluminum	**CL-37-A**
2 5/16	303 Stainless Steel	**CL-37-SS**
2 5/16	316 Stainless Steel	**CL-37-ST**
2 3/8	Steel	**CL-38-F**
2 3/8	Zinc Plated Steel	**CL-38-FZ**
2 3/8	Aluminum	**CL-38-A**
2 3/8	303 Stainless Steel	**CL-38-SS**
2 3/8	316 Stainless Steel	**CL-38-ST**
2 7/16	Steel	**CL-39-F**
2 7/16	Zinc Plated Steel	**CL-39-FZ**
2 7/16	Aluminum	**CL-39-A**
2 7/16	303 Stainless Steel	**CL-39-SS**
2 7/16	316 Stainless Steel	**CL-39-ST**
2 1/2	Steel	**CL-40-F**
2 1/2	Zinc Plated Steel	**CL-40-FZ**
2 1/2	Aluminum	**CL-40-A**
2 1/2	303 Stainless Steel	**CL-40-SS**
2 1/2	316 Stainless Steel	**CL-40-ST**
2 9/16	Steel	**CL-41-F**
2 9/16	Zinc Plated Steel	**CL-41-FZ**
2 9/16	Aluminum	**CL-41-A**
2 9/16	303 Stainless Steel	**CL-41-SS**
2 9/16	316 Stainless Steel	**CL-41-ST**
2 5/8	Steel	**CL-42-F**
2 5/8	Zinc Plated Steel	**CL-42-FZ**
2 5/8	Aluminum	**CL-42-A**
2 5/8	303 Stainless Steel	**CL-42-SS**
2 5/8	316 Stainless Steel	**CL-42-ST**
2 11/16	Steel	**CL-43-F**
2 11/16	Zinc Plated Steel	**CL-43-FZ**
2 11/16	Aluminum	**CL-43-A**
2 11/16	303 Stainless Steel	**CL-43-SS**
2 11/16	316 Stainless Steel	**CL-43-ST**
2 3/4	Steel	**CL-44-F**
2 3/4	Zinc Plated Steel	**CL-44-FZ**
2 3/4	Aluminum	**CL-44-A**
2 3/4	303 Stainless Steel	**CL-44-SS**
2 3/4	316 Stainless Steel	**CL-44-ST**
2 13/16	Steel	**CL-45-F**
2 13/16	Zinc Plated Steel	**CL-45-FZ**
2 13/16	Aluminum	**CL-45-A**
2 13/16	303 Stainless Steel	**CL-45-SS**
2 13/16	316 Stainless Steel	**CL-45-ST**
2 7/8	Steel	**CL-46-F**
2 7/8	Zinc Plated Steel	**CL-46-FZ**
2 7/8	Aluminum	**CL-46-A**
2 7/8	303 Stainless Steel	**CL-46-SS**
2 7/8	316 Stainless Steel	**CL-46-ST**
2 15/16	Steel	**CL-47-F**
2 15/16	Zinc Plated Steel	**CL-47-FZ**
2 15/16	Aluminum	**CL-47-A**
2 15/16	303 Stainless Steel	**CL-47-SS**
2 15/16	316 Stainless Steel	**CL-47-ST**
3	Steel	**CL-48-F**
3	Zinc Plated Steel	**CL-48-FZ**
3	Aluminum	**CL-48-A**
3	303 Stainless Steel	**CL-48-SS**
3	316 Stainless Steel	**CL-48-ST**

Ruland Shaft Collars Part Numbers

One Piece Clamping Shaft Collars

Metric Bores

Bore	Material	Part Number
3	Steel	**MCL-3-F**
3	Zinc Plated Steel	**MCL-3-FZ**
3	Aluminum	**MCL-3-A**
3	Anodized Aluminum	**MCL-3-AN**
3	303 Stainless Steel	**MCL-3-SS**
4	Steel	**MCL-4-F**
4	Zinc Plated Steel	**MCL-4-FZ**
4	Aluminum	**MCL-4-A**
4	Anodized Aluminum	**MCL-4-AN**
4	303 Stainless Steel	**MCL-4-SS**
4	316 Stainless Steel	**MCL-4-ST**
4	Plastic	**MCL-4-P**
5	Steel	**MCL-5-F**
5	Zinc Plated Steel	**MCL-5-FZ**
5	Aluminum	**MCL-5-A**
5	Anodized Aluminum	**MCL-5-AN**
5	303 Stainless Steel	**MCL-5-SS**
5	316 Stainless Steel	**MCL-5-ST**
5	Plastic	**MCL-5-P**
6	Steel	**MCL-6-F**
6	Zinc Plated Steel	**MCL-6-FZ**
6	Aluminum	**MCL-6-A**
6	Anodized Aluminum	**MCL-6-AN**
6	303 Stainless Steel	**MCL-6-SS**
6	316 Stainless Steel	**MCL-6-ST**
6	Plastic	**MCL-6-P**
7	Steel	**MCL-7-F**
7	Zinc Plated Steel	**MCL-7-FZ**
7	Aluminum	**MCL-7-A**
7	Anodized Aluminum	**MCL-7-AN**
7	303 Stainless Steel	**MCL-7-SS**
8	Steel	**MCL-8-F**
8	Zinc Plated Steel	**MCL-8-FZ**
8	Aluminum	**MCL-8-A**
8	Anodized Aluminum	**MCL-8-AN**
8	303 Stainless Steel	**MCL-8-SS**
8	316 Stainless Steel	**MCL-8-ST**
8	Plastic	**MCL-8-P**
9	Steel	**MCL-9-F**
9	Zinc Plated Steel	**MCL-9-FZ**
9	Aluminum	**MCL-9-A**
9	Anodized Aluminum	**MCL-9-AN**
9	303 Stainless Steel	**MCL-9-SS**
10	Steel	**MCL-10-F**
10	Zinc Plated Steel	**MCL-10-FZ**
10	Aluminum	**MCL-10-A**
10	Anodized Aluminum	**MCL-10-AN**
10	303 Stainless Steel	**MCL-10-SS**
10	316 Stainless Steel	**MCL-10-ST**
10	Plastic	**MCL-10-P**
11	Steel	**MCL-11-F**
11	Zinc Plated Steel	**MCL-11-FZ**
11	Aluminum	**MCL-11-A**
11	Anodized Aluminum	**MCL-11-AN**
11	303 Stainless Steel	**MCL-11-SS**
12	Steel	**MCL-12-F**
12	Zinc Plated Steel	**MCL-12-FZ**
12	Aluminum	**MCL-12-A**
12	Anodized Aluminum	**MCL-12-AN**
12	303 Stainless Steel	**MCL-12-SS**
12	316 Stainless Steel	**MCL-12-ST**
12	Plastic	**MCL-12-P**
13	Steel	**MCL-13-F**
13	Zinc Plated Steel	**MCL-13-FZ**
13	Aluminum	**MCL-13-A**
13	Anodized Aluminum	**MCL-13-AN**
13	303 Stainless Steel	**MCL-13-SS**
14	Steel	**MCL-14-F**
14	Zinc Plated Steel	**MCL-14-FZ**
14	Aluminum	**MCL-14-A**
14	Anodized Aluminum	**MCL-14-AN**
14	303 Stainless Steel	**MCL-14-SS**
14	316 Stainless Steel	**MCL-14-ST**
14	Plastic	**MCL-14-P**
15	Steel	**MCL-15-F**
15	Zinc Plated Steel	**MCL-15-FZ**
15	Aluminum	**MCL-15-A**
15	Anodized Aluminum	**MCL-15-AN**
15	303 Stainless Steel	**MCL-15-SS**
15	316 Stainless Steel	**MCL-15-ST**
15	Plastic	**MCL-15-P**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
16	Steel	**MCL-16-F**
16	Zinc Plated Steel	**MCL-16-FZ**
16	Aluminum	**MCL-16-A**
16	Anodized Aluminum	**MCL-16-AN**
16	303 Stainless Steel	**MCL-16-SS**
16	316 Stainless Steel	**MCL-16-ST**
16	Plastic	**MCL-16-P**
17	Steel	**MCL-17-F**
17	Zinc Plated Steel	**MCL-17-FZ**
17	Aluminum	**MCL-17-A**
17	Anodized Aluminum	**MCL-17-AN**
17	303 Stainless Steel	**MCL-17-SS**
18	Steel	**MCL-18-F**
18	Zinc Plated Steel	**MCL-18-FZ**
18	Aluminum	**MCL-18-A**
18	Anodized Aluminum	**MCL-18-AN**
18	303 Stainless Steel	**MCL-18-SS**
19	Steel	**MCL-19-F**
19	Zinc Plated Steel	**MCL-19-FZ**
19	Aluminum	**MCL-19-A**
19	Anodized Aluminum	**MCL-19-AN**
19	303 Stainless Steel	**MCL-19-SS**
20	Steel	**MCL-20-F**
20	Zinc Plated Steel	**MCL-20-FZ**
20	Aluminum	**MCL-20-A**
20	Anodized Aluminum	**MCL-20-AN**
20	303 Stainless Steel	**MCL-20-SS**
20	316 Stainless Steel	**MCL-20-ST**
20	Plastic	**MCL-20-P**
21	Steel	**MCL-21-F**
21	Zinc Plated Steel	**MCL-21-FZ**
21	Aluminum	**MCL-21-A**
21	Anodized Aluminum	**MCL-21-AN**
21	303 Stainless Steel	**MCL-21-SS**
22	Steel	**MCL-22-F**
22	Zinc Plated Steel	**MCL-22-FZ**
22	Aluminum	**MCL-22-A**
22	Anodized Aluminum	**MCL-22-AN**
22	303 Stainless Steel	**MCL-22-SS**
22	Plastic	**MCL-22-P**
23	Steel	**MCL-23-F**
23	Zinc Plated Steel	**MCL-23-FZ**

Bore	Material	Part Number
23	Aluminum	**MCL-23-A**
23	Anodized Aluminum	**MCL-23-AN**
23	303 Stainless Steel	**MCL-23-SS**
24	Steel	**MCL-24-F**
24	Zinc Plated Steel	**MCL-24-FZ**
24	Aluminum	**MCL-24-A**
24	Anodized Aluminum	**MCL-24-AN**
24	303 Stainless Steel	**MCL-24-SS**
25	Steel	**MCL-25-F**
25	Zinc Plated Steel	**MCL-25-FZ**
25	Aluminum	**MCL-25-A**
25	Anodized Aluminum	**MCL-25-AN**
25	303 Stainless Steel	**MCL-25-SS**
25	316 Stainless Steel	**MCL-25-ST**
25	Plastic	**MCL-25-P**
26	Steel	**MCL-26-F**
26	Zinc Plated Steel	**MCL-26-FZ**
26	Aluminum	**MCL-26-A**
26	Anodized Aluminum	**MCL-26-AN**
26	303 Stainless Steel	**MCL-26-SS**
28	Steel	**MCL-28-F**
28	Zinc Plated Steel	**MCL-28-FZ**
28	Aluminum	**MCL-28-A**
28	Anodized Aluminum	**MCL-28-AN**
28	303 Stainless Steel	**MCL-28-SS**
28	Plastic	**MCL-28-P**
30	Steel	**MCL-30-F**
30	Zinc Plated Steel	**MCL-30-FZ**
30	Aluminum	**MCL-30-A**
30	Anodized Aluminum	**MCL-30-AN**
30	303 Stainless Steel	**MCL-30-SS**
30	316 Stainless Steel	**MCL-30-ST**
30	Plastic	**MCL-30-P**
32	Steel	**MCL-32-F**
32	Zinc Plated Steel	**MCL-32-FZ**
32	Aluminum	**MCL-32-A**
32	Anodized Aluminum	**MCL-32-AN**
32	303 Stainless Steel	**MCL-32-SS**
34	Steel	**MCL-34-F**
34	Zinc Plated Steel	**MCL-34-FZ**
34	Aluminum	**MCL-34-A**
34	Anodized Aluminum	**MCL-34-AN**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
34	303 Stainless Steel	**MCL-34-SS**
35	Steel	**MCL-35-F**
35	Zinc Plated Steel	**MCL-35-FZ**
35	Aluminum	**MCL-35-A**
35	Anodized Aluminum	**MCL-35-AN**
35	303 Stainless Steel	**MCL-35-SS**
36	Steel	**MCL-36-F**
36	Zinc Plated Steel	**MCL-36-FZ**
36	Aluminum	**MCL-36-A**
36	Anodized Aluminum	**MCL-36-AN**
36	303 Stainless Steel	**MCL-36-SS**
38	Steel	**MCL-38-F**
38	Zinc Plated Steel	**MCL-38-FZ**
38	Aluminum	**MCL-38-A**
38	Anodized Aluminum	**MCL-38-AN**
38	303 Stainless Steel	**MCL-38-SS**
40	Steel	**MCL-40-F**
40	Zinc Plated Steel	**MCL-40-FZ**
40	Aluminum	**MCL-40-A**
40	Anodized Aluminum	**MCL-40-AN**
40	303 Stainless Steel	**MCL-40-SS**
40	316 Stainless Steel	**MCL-40-ST**
42	Steel	**MCL-42-F**
42	Zinc Plated Steel	**MCL-42-FZ**
42	Aluminum	**MCL-42-A**
42	Anodized Aluminum	**MCL-42-AN**
42	303 Stainless Steel	**MCL-42-SS**
45	Steel	**MCL-45-F**
45	Zinc Plated Steel	**MCL-45-FZ**
45	Aluminum	**MCL-45-A**
45	Anodized Aluminum	**MCL-45-AN**
45	303 Stainless Steel	**MCL-45-SS**
48	Steel	**MCL-48-F**
48	Zinc Plated Steel	**MCL-48-FZ**
48	Aluminum	**MCL-48-A**
48	Anodized Aluminum	**MCL-48-AN**
48	303 Stainless Steel	**MCL-48-SS**
50	Steel	**MCL-50-F**
50	Zinc Plated Steel	**MCL-50-FZ**
50	Aluminum	**MCL-50-A**
50	Anodized Aluminum	**MCL-50-AN**
50	303 Stainless Steel	**MCL-50-SS**

Bore	Material	Part Number
50	316 Stainless Steel	**MCL-50-ST**
54	Steel	**MCL-54-F**
54	303 Stainless Steel	**MCL-54-SS**
55	Steel	**MCL-55-F**
55	303 Stainless Steel	**MCL-55-SS**
60	Steel	**MCL-60-F**
60	303 Stainless Steel	**MCL-60-SS**
65	Steel	**MCL-65-F**
65	303 Stainless Steel	**MCL-65-SS**
70	Steel	**MCL-70-F**
70	303 Stainless Steel	**MCL-70-SS**
75	Steel	**MCL-75-F**
75	303 Stainless Steel	**MCL-75-SS**
80	Steel	**MCL-80-F**
80	303 Stainless Steel	**MCL-80-SS**

Thin One Piece Clamping Shaft Collar

Inch Bores

Bore	OD (mm)	Material	Part Number
3/16	20	Aluminum	**ENCL20-3-A**
3/16	20	Stainless Steel	**ENCL20-3-SS**
1/4	20	Aluminum	**ENCL20-4-A**
1/4	20	Stainless Steel	**ENCL20-4-SS**
1/4	25	Aluminum	**ENCL25-4-A**
1/4	25	Stainless Steel	**ENCL25-4-SS**
1/4	30	Aluminum	**ENCL30-4-A**
1/4	30	Stainless Steel	**ENCL30-4-SS**
5/16	20	Aluminum	**ENCL20-5-A**
5/16	20	Stainless Steel	**ENCL20-5-SS**
5/16	25	Aluminum	**ENCL25-5-A**
5/16	25	Stainless Steel	**ENCL25-5-SS**
5/16	30	Aluminum	**ENCL30-5-A**
5/16	30	Stainless Steel	**ENCL30-5-SS**
3/8	20	Aluminum	**ENCL20-6-A**
3/8	20	Stainless Steel	**ENCL20-6-SS**
3/8	25	Aluminum	**ENCL25-6-A**
3/8	25	Stainless Steel	**ENCL25-6-SS**
3/8	30	Aluminum	**ENCL30-6-A**
3/8	30	Stainless Steel	**ENCL30-6-SS**
1/2	25	Aluminum	**ENCL25-8-A**
1/2	25	Stainless Steel	**ENCL25-8-SS**
1/2	30	Aluminum	**ENCL30-8-A**
1/2	30	Stainless Steel	**ENCL30-8-SS**
1/2	35	Aluminum	**ENCL35-8-A**
1/2	35	Stainless Steel	**ENCL35-8-SS**
5/8	30	Aluminum	**ENCL30-10-A**
5/8	30	Stainless Steel	**ENCL30-10-SS**
5/8	35	Aluminum	**ENCL35-10-A**

Ruland Shaft Collars Part Numbers

Bore	OD (mm)	Material	Part Number
5/8	35	Stainless Steel	**ENCL35-10-SS**
5/8	45	Aluminum	**ENCL45-10-A**
5/8	45	Stainless Steel	**ENCL45-10-SS**
3/4	35	Aluminum	**ENCL35-12-A**
3/4	35	Stainless Steel	**ENCL35-12-SS**
3/4	45	Aluminum	**ENCL45-12-A**
3/4	45	Stainless Steel	**ENCL45-12-SS**
7/8	45	Aluminum	**ENCL45-14-A**
7/8	45	Stainless Steel	**ENCL45-14-SS**
1	45	Aluminum	**ENCL45-16-A**
1	45	Stainless Steel	**ENCL45-16-SS**
1	60	Aluminum	**ENCL60-16-A**
1	60	Stainless Steel	**ENCL60-16-SS**
1 1/8	60	Aluminum	**ENCL60-18-A**
1 1/8	60	Stainless Steel	**ENCL60-18-SS**
1 1/4	60	Aluminum	**ENCL60-20-A**
1 1/4	60	Stainless Steel	**ENCL60-20-SS**
1 3/8	60	Aluminum	**ENCL60-22-A**
1 3/8	60	Stainless Steel	**ENCL60-22-SS**
1 1/2	60	Aluminum	**ENCL60-24-A**
1 1/2	60	Stainless Steel	**ENCL60-24-SS**

Thin One Piece Clamping Shaft Collar

Metric Bores

Bore	OD	Material	Part Number
5	20	Aluminum	**ENCL20-5MM-A**
5	20	Stainless Steel	**ENCL20-5MM-SS**
5	25	Aluminum	**ENCL25-5MM-A**
5	25	Stainless Steel	**ENCL25-5MM-SS**
6	20	Aluminum	**ENCL20-6MM-A**
6	20	Stainless Steel	**ENCL20-6MM-SS**
6	25	Aluminum	**ENCL25-6MM-A**
6	25	Stainless Steel	**ENCL25-6MM-SS**
6	30	Aluminum	**ENCL30-6MM-A**
6	30	Stainless Steel	**ENCL30-6MM-SS**
8	20	Aluminum	**ENCL20-8MM-A**
8	20	Stainless Steel	**ENCL20-8MM-SS**
8	25	Aluminum	**ENCL25-8MM-A**
8	25	Stainless Steel	**ENCL25-8MM-SS**
8	30	Aluminum	**ENCL30-8MM-A**
8	30	Stainless Steel	**ENCL30-8MM-SS**
10	20	Aluminum	**ENCL20-10MM-A**
10	20	Stainless Steel	**ENCL20-10MM-SS**
10	25	Aluminum	**ENCL25-10MM-A**
10	25	Stainless Steel	**ENCL25-10MM-SS**
10	30	Aluminum	**ENCL30-10MM-A**
10	30	Stainless Steel	**ENCL30-10MM-SS**
12	25	Aluminum	**ENCL25-12MM-A**
12	25	Stainless Steel	**ENCL25-12MM-SS**
12	30	Aluminum	**ENCL30-12MM-A**
12	30	Stainless Steel	**ENCL30-12MM-SS**
12	35	Aluminum	**ENCL35-12MM-A**
12	35	Stainless Steel	**ENCL35-12MM-SS**
14	25	Aluminum	**ENCL25-14MM-A**
14	25	Stainless Steel	**ENCL25-14MM-SS**
14	30	Aluminum	**ENCL30-14MM-A**
14	30	Stainless Steel	**ENCL30-14MM-SS**
14	35	Aluminum	**ENCL35-14MM-A**
14	35	Stainless Steel	**ENCL35-14MM-SS**
15	30	Aluminum	**ENCL30-15MM-A**
15	30	Stainless Steel	**ENCL30-15MM-SS**
15	35	Aluminum	**ENCL35-15MM-A**
15	35	Stainless Steel	**ENCL35-15MM-SS**
16	30	Aluminum	**ENCL30-16MM-A**
16	30	Stainless Steel	**ENCL30-16MM-SS**
16	35	Aluminum	**ENCL35-16MM-A**
16	35	Stainless Steel	**ENCL35-16MM-SS**
16	45	Aluminum	**ENCL45-16MM-A**
16	45	Stainless Steel	**ENCL45-16MM-SS**
20	35	Aluminum	**ENCL35-20MM-A**
20	35	Stainless Steel	**ENCL35-20MM-SS**
20	45	Aluminum	**ENCL45-20MM-A**
20	45	Stainless Steel	**ENCL45-20MM-SS**
24	45	Aluminum	**ENCL45-24MM-A**
24	45	Stainless Steel	**ENCL45-24MM-SS**
25	45	Aluminum	**ENCL45-25MM-A**
25	45	Stainless Steel	**ENCL45-25MM-SS**
25	60	Aluminum	**ENCL60-25MM-A**
25	60	Stainless Steel	**ENCL60-25MM-SS**
30	60	Aluminum	**ENCL60-30MM-A**
30	60	Stainless Steel	**ENCL60-30MM-SS**
32	60	Aluminum	**ENCL60-32MM-A**
32	60	Stainless Steel	**ENCL60-32MM-SS**
35	60	Aluminum	**ENCL60-35MM-A**
35	60	Stainless Steel	**ENCL60-35MM-SS**
40	60	Aluminum	**ENCL60-40MM-A**
40	60	Stainless Steel	**ENCL60-40MM-SS**

Heavy Duty Clamping Shaft Collars

Inch Bores

Bore	Material	Part Number
3 1/16	Steel	**CLH-49-F**
3 1/8	Steel	**CLH-50-F**
3 3/16	Steel	**CLH-51-F**
3 1/4	Steel	**CLH-52-F**
3 5/16	Steel	**CLH-53-F**
3 3/8	Steel	**CLH-54-F**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
3 7/16	Steel	**CLH-55-F**
3 1/2	Steel	**CLH-56-F**
3 9/16	Steel	**CLH-57-F**
3 5/8	Steel	**CLH-58-F**
3 11/16	Steel	**CLH-59-F**
3 3/4	Steel	**CLH-60-F**
3 13/16	Steel	**CLH-61-F**
3 7/8	Steel	**CLH-62-F**
3 15/16	Steel	**CLH-63-F**
4	Steel	**CLH-64-F**
4 1/16	Steel	**CLH-65-F**
4 1/8	Steel	**CLH-66-F**
4 3/16	Steel	**CLH-67-F**
4 1/4	Steel	**CLH-68-F**
4 5/16	Steel	**CLH-69-F**
4 3/8	Steel	**CLH-70-F**
4 7/16	Steel	**CLH-71-F**
4 1/2	Steel	**CLH-72-F**
4 9/16	Steel	**CLH-73-F**
4 5/8	Steel	**CLH-74-F**
4 11/16	Steel	**CLH-75-F**
4 3/4	Steel	**CLH-76-F**
4 13/16	Steel	**CLH-77-F**
4 7/8	Steel	**CLH-78-F**
4 15/16	Steel	**CLH-79-F**
5	Steel	**CLH-80-F**
5 1/16	Steel	**CLH-81-F**
5 1/8	Steel	**CLH-82-F**
5 3/16	Steel	**CLH-83-F**
5 1/4	Steel	**CLH-84-F**
5 5/16	Steel	**CLH-85-F**
5 3/8	Steel	**CLH-86-F**
5 7/16	Steel	**CLH-87-F**
5 1/2	Steel	**CLH-88-F**
5 9/16	Steel	**CLH-89-F**
5 5/8	Steel	**CLH-90-F**
5 11/16	Steel	**CLH-91-F**
5 3/4	Steel	**CLH-92-F**
5 13/16	Steel	**CLH-93-F**
5 7/8	Steel	**CLH-94-F**
5 15/16	Steel	**CLH-95-F**
6	Steel	**CLH-96-F**

Heavy Duty Clamping Shaft Collars

Metric Bores

Bore	Material	Part Number
75	Steel	**MCLH-75-F**
80	Steel	**MCLH-80-F**
85	Steel	**MCLH-85-F**
90	Steel	**MCLH-90-F**
95	Steel	**MCLH-95-F**
100	Steel	**MCLH-100-F**
105	Steel	**MCLH-105-F**
110	Steel	**MCLH-110-F**
115	Steel	**MCLH-115-F**
120	Steel	**MCLH-120-F**
125	Steel	**MCLH-125-F**
130	Steel	**MCLH-130-F**
135	Steel	**MCLH-135-F**
140	Steel	**MCLH-140-F**
145	Steel	**MCLH-145-F**
150	Steel	**MCLH-150-F**

Two Piece Clamping Shaft Collars

Inch Bores

Bore	Material	Part Number
1/8	Steel	**SP-2-F**
1/8	Zinc Plated Steel	**SP-2-FZ**
1/8	Aluminum	**SP-2-A**
1/8	303 Stainless Steel	**SP-2-SS**
1/8	316 Stainless Steel	**SP-2-ST**
1/8	Plastic	**SP-2-P**
3/16	Steel	**SP-3-F**
3/16	Zinc Plated Steel	**SP-3-FZ**
3/16	Aluminum	**SP-3-A**
3/16	303 Stainless Steel	**SP-3-SS**
3/16	316 Stainless Steel	**SP-3-ST**
3/16	Plastic	**SP-3-P**
1/4	Steel	**SP-4-F**
1/4	Zinc Plated Steel	**SP-4-FZ**
1/4	Aluminum	**SP-4-A**
1/4	303 Stainless Steel	**SP-4-SS**
1/4	316 Stainless Steel	**SP-4-ST**
1/4	Plastic	**SP-4-P**
5/16	Steel	**SP-5-F**
5/16	Zinc Plated Steel	**SP-5-FZ**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
5/16	Aluminum	**SP-5-A**
5/16	303 Stainless Steel	**SP-5-SS**
5/16	316 Stainless Steel	**SP-5-ST**
5/16	Plastic	**SP-5-P**
3/8	Steel	**SP-6-F**
3/8	Zinc Plated Steel	**SP-6-FZ**
3/8	Aluminum	**SP-6-A**
3/8	303 Stainless Steel	**SP-6-SS**
3/8	316 Stainless Steel	**SP-6-ST**
3/8	Plastic	**SP-6-P**
7/16	Steel	**SP-7-F**
7/16	Zinc Plated Steel	**SP-7-FZ**
7/16	Aluminum	**SP-7-A**
7/16	303 Stainless Steel	**SP-7-SS**
7/16	316 Stainless Steel	**SP-7-ST**
7/16	Plastic	**SP-7-P**
1/2	Steel	**SP-8-F**
1/2	Zinc Plated Steel	**SP-8-FZ**
1/2	Aluminum	**SP-8-A**
1/2	303 Stainless Steel	**SP-8-SS**
1/2	316 Stainless Steel	**SP-8-ST**
1/2	Plastic	**SP-8-P**
9/16	Steel	**SP-9-F**
9/16	Zinc Plated Steel	**SP-9-FZ**
9/16	Aluminum	**SP-9-A**
9/16	303 Stainless Steel	**SP-9-SS**
9/16	316 Stainless Steel	**SP-9-ST**
9/16	Plastic	**SP-9-P**
5/8	Steel	**SP-10-F**
5/8	Zinc Plated Steel	**SP-10-FZ**
5/8	Aluminum	**SP-10-A**
5/8	303 Stainless Steel	**SP-10-SS**
5/8	316 Stainless Steel	**SP-10-ST**
5/8	Plastic	**SP-10-P**
11/16	Steel	**SP-11-F**
11/16	Zinc Plated Steel	**SP-11-FZ**
11/16	Aluminum	**SP-11-A**
11/16	303 Stainless Steel	**SP-11-SS**
11/16	316 Stainless Steel	**SP-11-ST**
11/16	Plastic	**SP-11-P**
3/4	Steel	**SP-12-F**
3/4	Zinc Plated Steel	**SP-12-FZ**
3/4	Aluminum	**SP-12-A**
3/4	303 Stainless Steel	**SP-12-SS**
3/4	316 Stainless Steel	**SP-12-ST**

Bore	Material	Part Number
3/4	Plastic	**SP-12-P**
13/16	Steel	**SP-13-F**
13/16	Zinc Plated Steel	**SP-13-FZ**
13/16	Aluminum	**SP-13-A**
13/16	303 Stainless Steel	**SP-13-SS**
13/16	316 Stainless Steel	**SP-13-ST**
13/16	Plastic	**SP-13-P**
7/8	Steel	**SP-14-F**
7/8	Zinc Plated Steel	**SP-14-FZ**
7/8	Aluminum	**SP-14-A**
7/8	303 Stainless Steel	**SP-14-SS**
7/8	316 Stainless Steel	**SP-14-ST**
7/8	Plastic	**SP-14-P**
15/16	Steel	**SP-15-F**
15/16	Zinc Plated Steel	**SP-15-FZ**
15/16	Aluminum	**SP-15-A**
15/16	303 Stainless Steel	**SP-15-SS**
15/16	316 Stainless Steel	**SP-15-ST**
15/16	Plastic	**SP-15-P**
1	Steel	**SP-16-F**
1	Zinc Plated Steel	**SP-16-FZ**
1	Aluminum	**SP-16-A**
1	303 Stainless Steel	**SP-16-SS**
1	316 Stainless Steel	**SP-16-ST**
1	Plastic	**SP-16-P**
1 1/16	Steel	**SP-17-F**
1 1/16	Zinc Plated Steel	**SP-17-FZ**
1 1/16	Aluminum	**SP-17-A**
1 1/16	303 Stainless Steel	**SP-17-SS**
1 1/16	316 Stainless Steel	**SP-17-ST**
1 1/16	Plastic	**SP-17-P**
1 1/8	Steel	**SP-18-F**
1 1/8	Zinc Plated Steel	**SP-18-FZ**
1 1/8	Aluminum	**SP-18-A**
1 1/8	303 Stainless Steel	**SP-18-SS**
1 1/8	316 Stainless Steel	**SP-18-ST**
1 1/8	Plastic	**SP-18-P**
1 3/16	Steel	**SP-19-F**
1 3/16	Zinc Plated Steel	**SP-19-FZ**
1 3/16	Aluminum	**SP-19-A**
1 3/16	303 Stainless Steel	**SP-19-SS**
1 3/16	316 Stainless Steel	**SP-19-ST**
1 3/16	Plastic	**SP-19-P**
1 1/4	Steel	**SP-20-F**
1 1/4	Zinc Plated Steel	**SP-20-FZ**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
1 1/4	Aluminum	**SP-20-A**
1 1/4	303 Stainless Steel	**SP-20-SS**
1 1/4	316 Stainless Steel	**SP-20-ST**
1 1/4	Plastic	**SP-20-P**
1 5/16	Steel	**SP-21-F**
1 5/16	Zinc Plated Steel	**SP-21-FZ**
1 5/16	Aluminum	**SP-21-A**
1 5/16	303 Stainless Steel	**SP-21-SS**
1 5/16	316 Stainless Steel	**SP-21-ST**
1 5/16	Plastic	**SP-21-P**
1 3/8	Steel	**SP-22-F**
1 3/8	Zinc Plated Steel	**SP-22-FZ**
1 3/8	Aluminum	**SP-22-A**
1 3/8	303 Stainless Steel	**SP-22-SS**
1 3/8	316 Stainless Steel	**SP-22-ST**
1 3/8	Plastic	**SP-22-P**
1 7/16	Steel	**SP-23-F**
1 7/16	Zinc Plated Steel	**SP-23-FZ**
1 7/16	Aluminum	**SP-23-A**
1 7/16	303 Stainless Steel	**SP-23-SS**
1 7/16	316 Stainless Steel	**SP-23-ST**
1 7/16	Plastic	**SP-23-P**
1 1/2	Steel	**SP-24-F**
1 1/2	Zinc Plated Steel	**SP-24-FZ**
1 1/2	Aluminum	**SP-24-A**
1 1/2	303 Stainless Steel	**SP-24-SS**
1 1/2	316 Stainless Steel	**SP-24-ST**
1 1/2	Plastic	**SP-24-P**
1 9/16	Steel	**SP-25-F**
1 9/16	Zinc Plated Steel	**SP-25-FZ**
1 9/16	Aluminum	**SP-25-A**
1 9/16	303 Stainless Steel	**SP-25-SS**
1 9/16	316 Stainless Steel	**SP-25-ST**
1 5/8	Steel	**SP-26-F**
1 5/8	Zinc Plated Steel	**SP-26-FZ**
1 5/8	Aluminum	**SP-26-A**
1 5/8	303 Stainless Steel	**SP-26-SS**
1 5/8	316 Stainless Steel	**SP-26-ST**
1 11/16	Steel	**SP-27-F**
1 11/16	Zinc Plated Steel	**SP-27-FZ**
1 11/16	Aluminum	**SP-27-A**
1 11/16	303 Stainless Steel	**SP-27-SS**
1 11/16	316 Stainless Steel	**SP-27-ST**
1 3/4	Steel	**SP-28-F**
1 3/4	Zinc Plated Steel	**SP-28-FZ**

Bore	Material	Part Number
1 3/4	Aluminum	**SP-28-A**
1 3/4	303 Stainless Steel	**SP-28-SS**
1 3/4	316 Stainless Steel	**SP-28-ST**
1 13/16	Steel	**SP-29-F**
1 13/16	Zinc Plated Steel	**SP-29-FZ**
1 13/16	Aluminum	**SP-29-A**
1 13/16	303 Stainless Steel	**SP-29-SS**
1 13/16	316 Stainless Steel	**SP-29-ST**
1 7/8	Steel	**SP-30-F**
1 7/8	Zinc Plated Steel	**SP-30-FZ**
1 7/8	Aluminum	**SP-30-A**
1 7/8	303 Stainless Steel	**SP-30-SS**
1 7/8	316 Stainless Steel	**SP-30-ST**
1 15/16	Steel	**SP-31-F**
1 15/16	Zinc Plated Steel	**SP-31-FZ**
1 15/16	Aluminum	**SP-31-A**
1 15/16	303 Stainless Steel	**SP-31-SS**
1 15/16	316 Stainless Steel	**SP-31-ST**
2	Steel	**SP-32-F**
2	Zinc Plated Steel	**SP-32-FZ**
2	Aluminum	**SP-32-A**
2	303 Stainless Steel	**SP-32-SS**
2	316 Stainless Steel	**SP-32-ST**
2 1/16	Steel	**SP-33-F**
2 1/16	Zinc Plated Steel	**SP-33-FZ**
2 1/16	Aluminum	**SP-33-A**
2 1/16	303 Stainless Steel	**SP-33-SS**
2 1/16	316 Stainless Steel	**SP-33-ST**
2 1/8	Steel	**SP-34-F**
2 1/8	Zinc Plated Steel	**SP-34-FZ**
2 1/8	Aluminum	**SP-34-A**
2 1/8	303 Stainless Steel	**SP-34-SS**
2 1/8	316 Stainless Steel	**SP-34-ST**
2 3/16	Steel	**SP-35-F**
2 3/16	Zinc Plated Steel	**SP-35-FZ**
2 3/16	Aluminum	**SP-35-A**
2 3/16	303 Stainless Steel	**SP-35-SS**
2 3/16	316 Stainless Steel	**SP-35-ST**
2 1/4	Steel	**SP-36-F**
2 1/4	Zinc Plated Steel	**SP-36-FZ**
2 1/4	Aluminum	**SP-36-A**
2 1/4	303 Stainless Steel	**SP-36-SS**
2 1/4	316 Stainless Steel	**SP-36-ST**
2 5/16	Steel	**SP-37-F**
2 5/16	Zinc Plated Steel	**SP-37-FZ**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
2 5/16	Aluminum	**SP-37-A**
2 5/16	303 Stainless Steel	**SP-37-SS**
2 5/16	316 Stainless Steel	**SP-37-ST**
2 3/8	Steel	**SP-38-F**
2 3/8	Zinc Plated Steel	**SP-38-FZ**
2 3/8	Aluminum	**SP-38-A**
2 3/8	303 Stainless Steel	**SP-38-SS**
2 3/8	316 Stainless Steel	**SP-38-ST**
2 7/16	Steel	**SP-39-F**
2 7/16	Zinc Plated Steel	**SP-39-FZ**
2 7/16	Aluminum	**SP-39-A**
2 7/16	303 Stainless Steel	**SP-39-SS**
2 7/16	316 Stainless Steel	**SP-39-ST**
2 1/2	Steel	**SP-40-F**
2 1/2	Zinc Plated Steel	**SP-40-FZ**
2 1/2	Aluminum	**SP-40-A**
2 1/2	303 Stainless Steel	**SP-40-SS**
2 1/2	316 Stainless Steel	**SP-40-ST**
2 9/16	Steel	**SP-41-F**
2 9/16	Zinc Plated Steel	**SP-41-FZ**
2 9/16	Aluminum	**SP-41-A**
2 9/16	303 Stainless Steel	**SP-41-SS**
2 9/16	316 Stainless Steel	**SP-41-ST**
2 5/8	Steel	**SP-42-F**
2 5/8	Zinc Plated Steel	**SP-42-FZ**
2 5/8	Aluminum	**SP-42-A**
2 5/8	303 Stainless Steel	**SP-42-SS**
2 5/8	316 Stainless Steel	**SP-42-ST**
2 11/16	Steel	**SP-43-F**
2 11/16	Zinc Plated Steel	**SP-43-FZ**
2 11/16	Aluminum	**SP-43-A**
2 11/16	303 Stainless Steel	**SP-43-SS**
2 11/16	316 Stainless Steel	**SP-43-ST**
2 3/4	Steel	**SP-44-F**
2 3/4	Zinc Plated Steel	**SP-44-FZ**
2 3/4	Aluminum	**SP-44-A**
2 3/4	303 Stainless Steel	**SP-44-SS**
2 3/4	316 Stainless Steel	**SP-44-ST**
2 13/16	Steel	**SP-45-F**
2 13/16	Zinc Plated Steel	**SP-45-FZ**
2 13/16	Aluminum	**SP-45-A**
2 13/16	303 Stainless Steel	**SP-45-SS**
2 13/16	316 Stainless Steel	**SP-45-ST**
2 7/8	Steel	**SP-46-F**
2 7/8	Zinc Plated Steel	**SP-46-FZ**
2 7/8	Aluminum	**SP-46-A**
2 7/8	303 Stainless Steel	**SP-46-SS**
2 7/8	316 Stainless Steel	**SP-46-ST**
2 15/16	Steel	**SP-47-F**
2 15/16	Zinc Plated Steel	**SP-47-FZ**
2 15/16	Aluminum	**SP-47-A**
2 15/16	303 Stainless Steel	**SP-47-SS**
2 15/16	316 Stainless Steel	**SP-47-ST**
3	Steel	**SP-48-F**
3	Zinc Plated Steel	**SP-48-FZ**
3	Aluminum	**SP-48-A**
3	303 Stainless Steel	**SP-48-SS**
3	316 Stainless Steel	**SP-48-ST**
3 1/16	Steel	**SP-49-F**
3 1/8	Steel	**SP-50-F**
3 3/16	Steel	**SP-51-F**
3 1/4	Steel	**SP-52-F**
3 5/16	Steel	**SP-53-F**
3 3/8	Steel	**SP-54-F**
3 7/16	Steel	**SP-55-F**
3 1/2	Steel	**SP-56-F**
3 9/16	Steel	**SP-57-F**
3 5/8	Steel	**SP-58-F**
3 11/16	Steel	**SP-59-F**
3 3/4	Steel	**SP-60-F**
3 13/16	Steel	**SP-61-F**
3 7/8	Steel	**SP-62-F**
3 15/16	Steel	**SP-63-F**
4	Steel	**SP-64-F**

Two Piece Clamping Shaft Collars

Metric Bores

Bore	Material	Part Number
3	Steel	**MSP-3-F**
3	Zinc Plated Steel	**MSP-3-FZ**
3	Aluminum	**MSP-3-A**
3	Anodized Aluminum	**MSP-3-AN**
3	303 Stainless Steel	**MSP-3-SS**
4	Steel	**MSP-4-F**
4	Zinc Plated Steel	**MSP-4-FZ**
4	Aluminum	**MSP-4-A**
4	Anodized Aluminum	**MSP-4-AN**
4	303 Stainless Steel	**MSP-4-SS**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
4	316 Stainless Steel	**MSP-4-ST**
4	Plastic	**MSP-4-P**
5	Steel	**MSP-5-F**
5	Zinc Plated Steel	**MSP-5-FZ**
5	Aluminum	**MSP-5-A**
5	Anodized Aluminum	**MSP-5-AN**
5	303 Stainless Steel	**MSP-5-SS**
5	316 Stainless Steel	**MSP-5-ST**
5	Plastic	**MSP-5-P**
6	Steel	**MSP-6-F**
6	Zinc Plated Steel	**MSP-6-FZ**
6	Aluminum	**MSP-6-A**
6	Anodized Aluminum	**MSP-6-AN**
6	303 Stainless Steel	**MSP-6-SS**
6	316 Stainless Steel	**MSP-6-ST**
6	Plastic	**MSP-6-P**
7	Steel	**MSP-7-F**
7	Zinc Plated Steel	**MSP-7-FZ**
7	Aluminum	**MSP-7-A**
7	Anodized Aluminum	**MSP-7-AN**
7	303 Stainless Steel	**MSP-7-SS**
8	Steel	**MSP-8-F**
8	Zinc Plated Steel	**MSP-8-FZ**
8	Aluminum	**MSP-8-A**
8	Anodized Aluminum	**MSP-8-AN**
8	303 Stainless Steel	**MSP-8-SS**
8	316 Stainless Steel	**MSP-8-ST**
8	Plastic	**MSP-8-P**
9	Steel	**MSP-9-F**
9	Zinc Plated Steel	**MSP-9-FZ**
9	Aluminum	**MSP-9-A**
9	Anodized Aluminum	**MSP-9-AN**
9	303 Stainless Steel	**MSP-9-SS**
10	Steel	**MSP-10-F**
10	Zinc Plated Steel	**MSP-10-FZ**
10	Aluminum	**MSP-10-A**
10	Anodized Aluminum	**MSP-10-AN**
10	303 Stainless Steel	**MSP-10-SS**
10	316 Stainless Steel	**MSP-10-ST**
10	Plastic	**MSP-10-P**
11	Steel	**MSP-11-F**
11	Zinc Plated Steel	**MSP-11-FZ**

Bore	Material	Part Number
11	Aluminum	**MSP-11-A**
11	Anodized Aluminum	**MSP-11-AN**
11	303 Stainless Steel	**MSP-11-SS**
12	Steel	**MSP-12-F**
12	Zinc Plated Steel	**MSP-12-FZ**
12	Aluminum	**MSP-12-A**
12	Anodized Aluminum	**MSP-12-AN**
12	303 Stainless Steel	**MSP-12-SS**
12	316 Stainless Steel	**MSP-12-ST**
12	Plastic	**MSP-12-P**
13	Steel	**MSP-13-F**
13	Zinc Plated Steel	**MSP-13-FZ**
13	Aluminum	**MSP-13-A**
13	Anodized Aluminum	**MSP-13-AN**
13	303 Stainless Steel	**MSP-13-SS**
14	Steel	**MSP-14-F**
14	Zinc Plated Steel	**MSP-14-FZ**
14	Aluminum	**MSP-14-A**
14	Anodized Aluminum	**MSP-14-AN**
14	303 Stainless Steel	**MSP-14-SS**
14	316 Stainless Steel	**MSP-14-ST**
14	Plastic	**MSP-14-P**
15	Steel	**MSP-15-F**
15	Zinc Plated Steel	**MSP-15-FZ**
15	Aluminum	**MSP-15-A**
15	Anodized Aluminum	**MSP-15-AN**
15	303 Stainless Steel	**MSP-15-SS**
15	316 Stainless Steel	**MSP-15-ST**
15	Plastic	**MSP-15-P**
16	Steel	**MSP-16-F**
16	Zinc Plated Steel	**MSP-16-FZ**
16	Aluminum	**MSP-16-A**
16	Anodized Aluminum	**MSP-16-AN**
16	303 Stainless Steel	**MSP-16-SS**
16	316 Stainless Steel	**MSP-16-ST**
16	Plastic	**MSP-16-P**
17	Steel	**MSP-17-F**
17	Zinc Plated Steel	**MSP-17-FZ**
17	Aluminum	**MSP-17-A**
17	Anodized Aluminum	**MSP-17-AN**
17	303 Stainless Steel	**MSP-17-SS**
18	Steel	**MSP-18-F**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
18	Zinc Plated Steel	**MSP-18-FZ**
18	Aluminum	**MSP-18-A**
18	Anodized Aluminum	**MSP-18-AN**
18	303 Stainless Steel	**MSP-18-SS**
19	Steel	**MSP-19-F**
19	Zinc Plated Steel	**MSP-19-FZ**
19	Aluminum	**MSP-19-A**
19	Anodized Aluminum	**MSP-19-AN**
19	303 Stainless Steel	**MSP-19-SS**
20	Steel	**MSP-20-F**
20	Zinc Plated Steel	**MSP-20-FZ**
20	Aluminum	**MSP-20-A**
20	Anodized Aluminum	**MSP-20-AN**
20	303 Stainless Steel	**MSP-20-SS**
20	316 Stainless Steel	**MSP-20-ST**
20	Plastic	**MSP-20-P**
21	Steel	**MSP-21-F**
21	Zinc Plated Steel	**MSP-21-FZ**
21	Aluminum	**MSP-21-A**
21	Anodized Aluminum	**MSP-21-AN**
21	303 Stainless Steel	**MSP-21-SS**
22	Steel	**MSP-22-F**
22	Zinc Plated Steel	**MSP-22-FZ**
22	Aluminum	**MSP-22-A**
22	Anodized Aluminum	**MSP-22-AN**
22	303 Stainless Steel	**MSP-22-SS**
22	Plastic	**MSP-22-P**
23	Steel	**MSP-23-F**
23	Zinc Plated Steel	**MSP-23-FZ**
23	Aluminum	**MSP-23-A**
23	Anodized Aluminum	**MSP-23-AN**
23	303 Stainless Steel	**MSP-23-SS**
24	Steel	**MSP-24-F**
24	Zinc Plated Steel	**MSP-24-FZ**
24	Aluminum	**MSP-24-A**
24	Anodized Aluminum	**MSP-24-AN**
24	303 Stainless Steel	**MSP-24-SS**
25	Steel	**MSP-25-F**
25	Zinc Plated Steel	**MSP-25-FZ**
25	Aluminum	**MSP-25-A**
25	Anodized Aluminum	**MSP-25-AN**
25	303 Stainless Steel	**MSP-25-SS**
25	316 Stainless Steel	**MSP-25-ST**
25	Plastic	**MSP-25-P**
26	Steel	**MSP-26-F**
26	Zinc Plated Steel	**MSP-26-FZ**
26	Aluminum	**MSP-26-A**
26	Anodized Aluminum	**MSP-26-AN**
26	303 Stainless Steel	**MSP-26-SS**
28	Steel	**MSP-28-F**
28	Zinc Plated Steel	**MSP-28-FZ**
28	Aluminum	**MSP-28-A**
28	Anodized Aluminum	**MSP-28-AN**
28	303 Stainless Steel	**MSP-28-SS**
28	Plastic	**MSP-28-P**
30	Steel	**MSP-30-F**
30	Zinc Plated Steel	**MSP-30-FZ**
30	Aluminum	**MSP-30-A**
30	Anodized Aluminum	**MSP-30-AN**
30	303 Stainless Steel	**MSP-30-SS**
30	316 Stainless Steel	**MSP-30-ST**
30	Plastic	**MSP-30-P**
32	Steel	**MSP-32-F**
32	Zinc Plated Steel	**MSP-32-FZ**
32	Aluminum	**MSP-32-A**
32	Anodized Aluminum	**MSP-32-AN**
32	303 Stainless Steel	**MSP-32-SS**
34	Steel	**MSP-34-F**
34	Zinc Plated Steel	**MSP-34-FZ**
34	Aluminum	**MSP-34-A**
34	Anodized Aluminum	**MSP-34-AN**
34	303 Stainless Steel	**MSP-34-SS**
35	Steel	**MSP-35-F**
35	Zinc Plated Steel	**MSP-35-FZ**
35	Aluminum	**MSP-35-A**
35	Anodized Aluminum	**MSP-35-AN**
35	303 Stainless Steel	**MSP-35-SS**
36	Steel	**MSP-36-F**
36	Zinc Plated Steel	**MSP-36-FZ**
36	Aluminum	**MSP-36-A**
36	Anodized Aluminum	**MSP-36-AN**
36	303 Stainless Steel	**MSP-36-SS**
38	Steel	**MSP-38-F**
38	Zinc Plated Steel	**MSP-38-FZ**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
38	Aluminum	**MSP-38-A**
38	Anodized Aluminum	**MSP-38-AN**
38	303 Stainless Steel	**MSP-38-SS**
40	Steel	**MSP-40-F**
40	Zinc Plated Steel	**MSP-40-FZ**
40	Aluminum	**MSP-40-A**
40	Anodized Aluminum	**MSP-40-AN**
40	303 Stainless Steel	**MSP-40-SS**
40	316 Stainless Steel	**MSP-40-ST**
42	Steel	**MSP-42-F**
42	Zinc Plated Steel	**MSP-42-FZ**
42	Aluminum	**MSP-42-A**
42	Anodized Aluminum	**MSP-42-AN**
42	303 Stainless Steel	**MSP-42-SS**
45	Steel	**MSP-45-F**
45	Zinc Plated Steel	**MSP-45-FZ**
45	Aluminum	**MSP-45-A**
45	Anodized Aluminum	**MSP-45-AN**
45	303 Stainless Steel	**MSP-45-SS**
48	Steel	**MSP-48-F**
48	Zinc Plated Steel	**MSP-48-FZ**
48	Aluminum	**MSP-48-A**
48	Anodized Aluminum	**MSP-48-AN**
48	303 Stainless Steel	**MSP-48-SS**
50	Steel	**MSP-50-F**
50	Zinc Plated Steel	**MSP-50-FZ**
50	Aluminum	**MSP-50-A**
50	Anodized Aluminum	**MSP-50-AN**
50	303 Stainless Steel	**MSP-50-SS**
50	316 Stainless Steel	**MSP-50-ST**
54	Steel	**MSP-54-F**
54	303 Stainless Steel	**MSP-54-SS**
55	Steel	**MSP-55-F**
55	303 Stainless Steel	**MSP-55-SS**
60	Steel	**MSP-60-F**
60	303 Stainless Steel	**MSP-60-SS**
65	Steel	**MSP-65-F**
65	303 Stainless Steel	**MSP-65-SS**
70	Steel	**MSP-70-F**
70	303 Stainless Steel	**MSP-70-SS**
75	Steel	**MSP-75-F**
75	303 Stainless Steel	**MSP-75-SS**

Bore	Material	Part Number
80	Steel	**MSP-80-F**
80	303 Stainless Steel	**MSP-80-SS**

Two Piece Keyed Shaft Collars

Inch Bores

Bore	Keyway	Material	Part Number
3/8	3/32	Steel	**SPK-6-F**
3/8	3/32	Aluminum	**SPK-6-A**
3/8	3/32	Stainless Steel	**SPK-6-SS**
1/2	1/8	Steel	**SPK-8-F**
1/2	1/8	Aluminum	**SPK-8-A**
1/2	1/8	Stainless Steel	**SPK-8-SS**
5/8	3/16	Steel	**SPK-10-F**
5/8	3/16	Aluminum	**SPK-10-A**
5/8	3/16	Stainless Steel	**SPK-10-SS**
3/4	3/16	Steel	**SPK-12-F**
3/4	3/16	Aluminum	**SPK-12-A**
3/4	3/16	Stainless Steel	**SPK-12-SS**
1	1/4	Steel	**SPK-16-F**
1	1/4	Aluminum	**SPK-16-A**
1	1/4	Stainless Steel	**SPK-16-SS**
1 1/4	1/4	Steel	**SPK-20-F**
1 1/4	1/4	Aluminum	**SPK-20-A**
1 1/4	1/4	Stainless Steel	**SPK-20-SS**
1 1/2	3/8	Steel	**SPK-24-F**
1 1/2	3/8	Aluminum	**SPK-24-A**
1 1/2	3/8	Stainless Steel	**SPK-24-SS**
1 3/4	3/8	Steel	**SPK-28-F**
1 3/4	3/8	Aluminum	**SPK-28-A**
1 3/4	3/8	Stainless Steel	**SPK-28-SS**
2	1/2	Steel	**SPK-32-F**
2	1/2	Aluminum	**SPK-32-A**
2	1/2	Stainless Steel	**SPK-32-SS**
2 3/16	1/2	Steel	**SPK-35-F**
2 3/16	1/2	Aluminum	**SPK-35-A**
2 3/16	1/2	Stainless Steel	**SPK-35-SS**
2 7/16	5/8	Steel	**SPK-39-F**
2 7/16	5/8	Aluminum	**SPK-39-A**
2 7/16	5/8	Stainless Steel	**SPK-39-SS**

Ruland Shaft Collars Part Numbers

Two Piece Keyed Shaft Collars

Metric Bores

Bore	Keyway	Material	Part Number
8	2	Steel	**MSPK-8-F**
8	2	Aluminum	**MSPK-8-A**
8	2	Stainless Steel	**MSPK-8-SS**
10	3	Steel	**MSPK-10-F**
10	3	Aluminum	**MSPK-10-A**
10	3	Stainless Steel	**MSPK-10-SS**
12	4	Steel	**MSPK-12-F**
12	4	Aluminum	**MSPK-12-A**
12	4	Stainless Steel	**MSPK-12-SS**
14	5	Steel	**MSPK-14-F**
14	5	Aluminum	**MSPK-14-A**
14	5	Stainless Steel	**MSPK-14-SS**
15	5	Steel	**MSPK-15-F**
15	5	Aluminum	**MSPK-15-A**
15	5	Stainless Steel	**MSPK-15-SS**
16	5	Steel	**MSPK-16-F**
16	5	Aluminum	**MSPK-16-A**
16	5	Stainless Steel	**MSPK-16-SS**
20	6	Steel	**MSPK-20-F**
20	6	Aluminum	**MSPK-20-A**
20	6	Stainless Steel	**MSPK-20-SS**
25	8	Steel	**MSPK-25-F**
25	8	Aluminum	**MSPK-25-A**
25	8	Stainless Steel	**MSPK-25-SS**
30	8	Steel	**MSPK-30-F**
30	8	Aluminum	**MSPK-30-A**
30	8	Stainless Steel	**MSPK-30-SS**
35	10	Steel	**MSPK-35-F**
35	10	Aluminum	**MSPK-35-A**
35	10	Stainless Steel	**MSPK-35-SS**
40	12	Steel	**MSPK-40-F**
40	12	Aluminum	**MSPK-40-A**
40	12	Stainless Steel	**MSPK-40-SS**
50	14	Steel	**MSPK-50-F**
50	14	Aluminum	**MSPK-50-A**
50	14	Stainless Steel	**MSPK-50-SS**

Thin Two-Piece Clamping Shaft Collars

Inch Bores

Bore	OD (mm)	Material	Part Number
3/16	20	Aluminum	**ENSP20-3-A**
3/16	20	Stainless Steel	**ENSP20-3-SS**
1/4	20	Aluminum	**ENSP20-4-A**
1/4	20	Stainless Steel	**ENSP20-4-SS**
1/4	25	Aluminum	**ENSP25-4-A**
1/4	25	Stainless Steel	**ENSP25-4-SS**
1/4	30	Aluminum	**ENSP30-4-A**
1/4	30	Stainless Steel	**ENSP30-4-SS**
5/16	20	Aluminum	**ENSP20-5-A**
5/16	20	Stainless Steel	**ENSP20-5-SS**
5/16	25	Aluminum	**ENSP25-5-A**
5/16	25	Stainless Steel	**ENSP25-5-SS**
5/16	30	Aluminum	**ENSP30-5-A**
5/16	30	Stainless Steel	**ENSP30-5-SS**
3/8	20	Aluminum	**ENSP20-6-A**
3/8	20	Stainless Steel	**ENSP20-6-SS**
3/8	25	Aluminum	**ENSP25-6-A**
3/8	25	Stainless Steel	**ENSP25-6-SS**
3/8	30	Aluminum	**ENSP30-6-A**
3/8	30	Stainless Steel	**ENSP30-6-SS**
1/2	25	Aluminum	**ENSP25-8-A**
1/2	25	Stainless Steel	**ENSP25-8-SS**
1/2	30	Aluminum	**ENSP30-8-A**
1/2	30	Stainless Steel	**ENSP30-8-SS**
1/2	35	Aluminum	**ENSP35-8-A**
1/2	35	Stainless Steel	**ENSP35-8-SS**
5/8	30	Aluminum	**ENSP30-10-A**
5/8	30	Stainless Steel	**ENSP30-10-SS**
5/8	35	Aluminum	**ENSP35-10-A**
5/8	35	Stainless Steel	**ENSP35-10-SS**
5/8	45	Aluminum	**ENSP45-10-A**
5/8	45	Stainless Steel	**ENSP45-10-SS**
3/4	35	Aluminum	**ENSP35-12-A**
3/4	35	Stainless Steel	**ENSP35-12-SS**
3/4	45	Aluminum	**ENSP45-12-A**
3/4	45	Stainless Steel	**ENSP45-12-SS**
7/8	45	Aluminum	**ENSP45-14-A**
7/8	45	Stainless Steel	**ENSP45-14-SS**
1	45	Aluminum	**ENSP45-16-A**
1	45	Stainless Steel	**ENSP45-16-SS**
1	60	Aluminum	**ENSP60-16-A**
1	60	Stainless Steel	**ENSP60-16-SS**
1 1/8	60	Aluminum	**ENSP60-18-A**
1 1/8	60	Stainless Steel	**ENSP60-18-SS**
1 1/4	60	Aluminum	**ENSP60-20-A**
1 1/4	60	Stainless Steel	**ENSP60-20-SS**
1 3/8	60	Aluminum	**ENSP60-22-A**
1 3/8	60	Stainless Steel	**ENSP60-22-SS**
1 1/2	60	Aluminum	**ENSP60-24-A**
1 1/2	60	Stainless Steel	**ENSP60-24-SS**

Ruland Shaft Collars Part Numbers

Thin Two-Piece Clamping Shaft Collars

Metric Bores

Bore	OD	Material	Part Number
5	20	Aluminum	**ENSP20-5MM-A**
5	20	Stainless Steel	**ENSP20-5MM-SS**
5	25	Aluminum	**ENSP25-5MM-A**
5	25	Stainless Steel	**ENSP25-5MM-SS**
6	20	Aluminum	**ENSP20-6MM-A**
6	20	Stainless Steel	**ENSP20-6MM-SS**
6	25	Aluminum	**ENSP25-6MM-A**
6	25	Stainless Steel	**ENSP25-6MM-SS**
6	30	Aluminum	**ENSP30-6MM-A**
6	30	Stainless Steel	**ENSP30-6MM-SS**
8	20	Aluminum	**ENSP20-8MM-A**
8	20	Stainless Steel	**ENSP20-8MM-SS**
8	25	Aluminum	**ENSP25-8MM-A**
8	25	Stainless Steel	**ENSP25-8MM-SS**
8	30	Aluminum	**ENSP30-8MM-A**
8	30	Stainless Steel	**ENSP30-8MM-SS**
10	20	Aluminum	**ENSP20-10MM-A**
10	20	Stainless Steel	**ENSP20-10MM-SS**
10	25	Aluminum	**ENSP25-10MM-A**
10	25	Stainless Steel	**ENSP25-10MM-SS**
10	30	Aluminum	**ENSP30-10MM-A**
10	30	Stainless Steel	**ENSP30-10MM-SS**
12	25	Aluminum	**ENSP25-12MM-A**
12	25	Stainless Steel	**ENSP25-12MM-SS**
12	30	Aluminum	**ENSP30-12MM-A**
12	30	Stainless Steel	**ENSP30-12MM-SS**
12	35	Aluminum	**ENSP35-12MM-A**
12	35	Stainless Steel	**ENSP35-12MM-SS**
14	25	Aluminum	**ENSP25-14MM-A**
14	25	Stainless Steel	**ENSP25-14MM-SS**
14	30	Aluminum	**ENSP30-14MM-A**
14	30	Stainless Steel	**ENSP30-14MM-SS**
14	35	Aluminum	**ENSP35-14MM-A**
14	35	Stainless Steel	**ENSP35-14MM-SS**
15	30	Aluminum	**ENSP30-15MM-A**
15	30	Stainless Steel	**ENSP30-15MM-SS**
15	35	Aluminum	**ENSP35-15MM-A**
15	35	Stainless Steel	**ENSP35-15MM-SS**
16	30	Aluminum	**ENSP30-16MM-A**
16	30	Stainless Steel	**ENSP30-16MM-SS**
16	35	Aluminum	**ENSP35-16MM-A**
16	35	Stainless Steel	**ENSP35-16MM-SS**
16	45	Aluminum	**ENSP45-16MM-A**
16	45	Stainless Steel	**ENSP45-16MM-SS**
20	35	Aluminum	**ENSP35-20MM-A**
20	35	Stainless Steel	**ENSP35-20MM-SS**
20	45	Aluminum	**ENSP45-20MM-A**
20	45	Stainless Steel	**ENSP45-20MM-SS**
24	45	Aluminum	**ENSP45-24MM-A**
24	45	Stainless Steel	**ENSP45-24MM-SS**
25	45	Aluminum	**ENSP45-25MM-A**
25	45	Stainless Steel	**ENSP45-25MM-SS**
25	60	Aluminum	**ENSP60-25MM-A**
25	60	Stainless Steel	**ENSP60-25MM-SS**
30	60	Aluminum	**ENSP60-30MM-A**
30	60	Stainless Steel	**ENSP60-30MM-SS**
32	60	Aluminum	**ENSP60-32MM-A**
32	60	Stainless Steel	**ENSP60-32MM-SS**
35	60	Aluminum	**ENSP60-35MM-A**
35	60	Stainless Steel	**ENSP60-35MM-SS**
40	60	Aluminum	**ENSP60-40MM-A**
40	60	Stainless Steel	**ENSP60-40MM-SS**

Heavy Duty Two-Piece Clamping Shaft Collars

Inch Bores

Bore	Material	Part Number
3	Steel	**SPH-48-F**
3	Stainless Steel	**SPH-48-SS**
3 1/16	Steel	**SPH-49-F**
3 1/16	Stainless Steel	**SPH-49-SS**
3 1/8	Steel	**SPH-50-F**
3 1/8	Stainless Steel	**SPH-50-SS**
3 3/16	Steel	**SPH-51-F**
3 3/16	Stainless Steel	**SPH-51-SS**
3 1/4	Steel	**SPH-52-F**
3 1/4	Stainless Steel	**SPH-52-SS**
3 5/16	Steel	**SPH-53-F**
3 5/16	Stainless Steel	**SPH-53-SS**
3 3/8	Steel	**SPH-54-F**
3 3/8	Stainless Steel	**SPH-54-SS**
3 7/16	Steel	**SPH-55-F**
3 7/16	Stainless Steel	**SPH-55-SS**
3 1/2	Steel	**SPH-56-F**
3 1/2	Stainless Steel	**SPH-56-SS**
3 9/16	Steel	**SPH-57-F**
3 9/16	Stainless Steel	**SPH-57-SS**
3 5/8	Steel	**SPH-58-F**
3 5/8	Stainless Steel	**SPH-58-SS**
3 11/16	Steel	**SPH-59-F**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
3 11/16	Stainless Steel	**SPH-59-SS**
3 3/4	Steel	**SPH-60-F**
3 3/4	Stainless Steel	**SPH-60-SS**
3 13/16	Steel	**SPH-61-F**
3 3/16	Stainless Steel	**SPH-61-SS**
3 7/8	Steel	**SPH-62-F**
3 7/8	Stainless Steel	**SPH-62-SS**
3 15/16	Steel	**SPH-63-F**
3 15/16	Stainless Steel	**SPH-63-SS**
4	Steel	**SPH-64-F**
4	Stainless Steel	**SPH-64-SS**
4 1/16	Steel	**SPH-65-F**
4 1/16	Stainless Steel	**SPH-65-SS**
4 1/8	Steel	**SPH-66-F**
4 1/8	Stainless Steel	**SPH-66-SS**
4 3/16	Steel	**SPH-67-F**
4 3/16	Stainless Steel	**SPH-67-SS**
4 1/4	Steel	**SPH-68-F**
4 1/4	Stainless Steel	**SPH-68-SS**
4 5/16	Steel	**SPH-69-F**
4 5/16	Stainless Steel	**SPH-69-SS**
4 3/8	Steel	**SPH-70-F**
4 3/8	Stainless Steel	**SPH-70-SS**
4 7/16	Steel	**SPH-71-F**
4 7/16	Stainless Steel	**SPH-71-SS**
4 1/2	Steel	**SPH-72-F**
4 1/2	Stainless Steel	**SPH-72-SS**
4 9/16	Steel	**SPH-73-F**
4 9/16	Stainless Steel	**SPH-73-SS**
4 5/8	Steel	**SPH-74-F**
4 5/8	Stainless Steel	**SPH-74-SS**
4 11/16	Steel	**SPH-75-F**
4 11/16	Stainless Steel	**SPH-75-SS**
4 3/4	Steel	**SPH-76-F**
4 3/4	Stainless Steel	**SPH-76-SS**
4 13/16	Steel	**SPH-77-F**
4 13/16	Stainless Steel	**SPH-77-SS**
4 7/8	Steel	**SPH-78-F**
4 7/8	Stainless Steel	**SPH-78-SS**
4 15/16	Steel	**SPH-79-F**
4 15/16	Stainless Steel	**SPH-79-SS**
5	Steel	**SPH-80-F**

Bore	Material	Part Number
5	Stainless Steel	**SPH-80-SS**
5 1/16	Steel	**SPH-81-F**
5 1/16	Stainless Steel	**SPH-81-SS**
5 1/8	Steel	**SPH-82-F**
5 1/8	Stainless Steel	**SPH-82-SS**
5 3/16	Steel	**SPH-83-F**
5 3/16	Stainless Steel	**SPH-83-SS**
5 1/4	Steel	**SPH-84-F**
5 1/4	Stainless Steel	**SPH-84-SS**
5 5/16	Steel	**SPH-85-F**
5 5/16	Stainless Steel	**SPH-85-SS**
5 3/8	Steel	**SPH-86-F**
5 3/8	Stainless Steel	**SPH-86-SS**
5 7/16	Steel	**SPH-87-F**
5 7/16	Stainless Steel	**SPH-87-SS**
5 1/2	Steel	**SPH-88-F**
5 1/2	Stainless Steel	**SPH-88-SS**
5 9/16	Steel	**SPH-89-F**
5 9/16	Stainless Steel	**SPH-89-SS**
5 5/8	Steel	**SPH-90-F**
5 5/8	Stainless Steel	**SPH-90-SS**
5 11/16	Steel	**SPH-91-F**
5 11/16	Stainless Steel	**SPH-91-SS**
5 3/4	Steel	**SPH-92-F**
5 3/4	Stainless Steel	**SPH-92-SS**
5 13/16	Steel	**SPH-93-F**
5 13/16	Stainless Steel	**SPH-93-SS**
5 7/8	Steel	**SPH-94-F**
5 7/8	Stainless Steel	**SPH-94-SS**
5 15/16	Steel	**SPH-95-F**
5 15/16	Stainless Steel	**SPH-95-SS**
6	Steel	**SPH-96-F**
6	Stainless Steel	**SPH-96-SS**

Ruland Shaft Collars Part Numbers

Two-Piece Heavy Duty Clamping Shaft Collars

Metric Bores

Bore	Material	Part Number
75	Steel	**MSPH-75-F**
75	Stainless Steel	**MSPH-75-SS**
80	Steel	**MSPH-80-F**
80	Stainless Steel	**MSPH-80-SS**
85	Steel	**MSPH-85-F**
85	Stainless Steel	**MSPH-85-SS**
90	Steel	**MSPH-90-F**
90	Stainless Steel	**MSPH-90-SS**
95	Steel	**MSPH-95-F**
95	Stainless Steel	**MSPH-95-SS**
100	Steel	**MSPH-100-F**
100	Stainless Steel	**MSPH-100-SS**
105	Steel	**MSPH-105-F**
105	Stainless Steel	**MSPH-105-SS**
110	Steel	**MSPH-110-F**
110	Stainless Steel	**MSPH-110-SS**
115	Steel	**MSPH-115-F**
115	Stainless Steel	**MSPH-115-SS**
120	Steel	**MSPH-120-F**
120	Stainless Steel	**MSPH-120-SS**
125	Steel	**MSPH-125-F**
125	Stainless Steel	**MSPH-125-SS**
130	Steel	**MSPH-130-F**
130	Stainless Steel	**MSPH-130-SS**
135	Steel	**MSPH-135-F**
135	Stainless Steel	**MSPH-135-SS**
140	Steel	**MSPH-140-F**
140	Stainless Steel	**MSPH-140-SS**
145	Steel	**MSPH-145-F**
145	Stainless Steel	**MSPH-145-SS**
150	Steel	**MSPH-150-F**
150	Stainless Steel	**MSPH-150-SS**

One Piece Double Wide Shaft Collars

Inch Bores

Bore	Material	Part Number
1/8	Steel	**WCL-2-F**
1/8	Aluminum	**WCL-2-A**
1/8	Stainless Steel	**WCL-2-SS**
3/16	Steel	**WCL-3-F**
3/16	Aluminum	**WCL-3-A**
3/16	Stainless Steel	**WCL-3-SS**
1/4	Steel	**WCL-4-F**
1/4	Aluminum	**WCL-4-A**
1/4	Stainless Steel	**WCL-4-SS**
5/16	Steel	**WCL-5-F**
5/16	Aluminum	**WCL-5-A**
5/16	Stainless Steel	**WCL-5-SS**
3/8	Steel	**WCL-6-F**
3/8	Aluminum	**WCL-6-A**
3/8	Stainless Steel	**WCL-6-SS**
1/2	Steel	**WCL-8-F**
1/2	Aluminum	**WCL-8-A**
1/2	Stainless Steel	**WCL-8-SS**
5/8	Steel	**WCL-10-F**
5/8	Stainless Steel	**WCL-10-SS**
3/4	Steel	**WCL-12-F**
3/4	Stainless Steel	**WCL-12-SS**
7/8	Steel	**WCL-14-F**
7/8	Stainless Steel	**WCL-14-SS**
1	Steel	**WCL-16-F**
1	Stainless Steel	**WCL-16-SS**
1 1/8	Steel	**WCL-18-F**
1 1/8	Stainless Steel	**WCL-18-SS**
1 1/4	Steel	**WCL-20-F**
1 1/4	Stainless Steel	**WCL-20-SS**
1 1/2	Steel	**WCL-24-F**
1 1/2	Stainless Steel	**WCL-24-SS**
1 3/4	Steel	**WCL-28-F**
1 3/4	Stainless Steel	**WCL-28-SS**
2	Steel	**WCL-32-F**
2	Stainless Steel	**WCL-32-SS**

Ruland Shaft Collars Part Numbers

One Piece Double Wide Shaft Collars

Metric Bores

Bore	Material	Part Number
6	Steel	**MWCL-6-F**
6	Aluminum	**MWCL-6-A**
6	Stainless Steel	**MWCL-6-SS**
8	Steel	**MWCL-8-F**
8	Aluminum	**MWCL-8-A**
8	Stainless Steel	**MWCL-8-SS**
10	Steel	**MWCL-10-F**
10	Aluminum	**MWCL-10-A**
10	Stainless Steel	**MWCL-10-SS**
12	Steel	**MWCL-12-F**
12	Aluminum	**MWCL-12-A**
12	Stainless Steel	**MWCL-12-SS**
16	Steel	**MWCL-16-F**
16	Stainless Steel	**MWCL-16-SS**
20	Steel	**MWCL-20-F**
20	Stainless Steel	**MWCL-20-SS**
25	Steel	**MWCL-25-F**
25	Stainless Steel	**MWCL-25-SS**

One Piece Double Wide Shaft Collars

Inch Bores

Bore	Material	Part Number
1/8	Steel	**WSP-2-F**
1/8	Stainless Steel	**WSP-2-SS**
3/16	Steel	**WSP-3-F**
3/16	Stainless Steel	**WSP-3-SS**
1/4	Steel	**WSP-4-F**
1/4	Stainless Steel	**WSP-4-SS**
5/16	Steel	**WSP-5-F**
5/16	Stainless Steel	**WSP-5-SS**
3/8	Steel	**WSP-6-F**
3/8	Stainless Steel	**WSP-6-SS**
1/2	Steel	**WSP-8-F**
1/2	Stainless Steel	**WSP-8-SS**
5/8	Steel	**WSP-10-F**
5/8	Stainless Steel	**WSP-10-SS**
3/4	Steel	**WSP-12-F**
3/4	Stainless Steel	**WSP-12-SS**
7/8	Steel	**WSP-14-F**
7/8	Stainless Steel	**WSP-14-SS**
1	Steel	**WSP-16-F**
1	Stainless Steel	**WSP-16-SS**
1 1/8	Steel	**WSP-18-F**
1 1/8	Stainless Steel	**WSP-18-SS**
1 1/4	Steel	**WSP-20-F**
1 1/4	Stainless Steel	**WSP-20-SS**
1 1/2	Steel	**WSP-24-F**
1 1/2	Stainless Steel	**WSP-24-SS**
1 3/4	Steel	**WSP-28-F**
1 3/4	Stainless Steel	**WSP-28-SS**
2	Steel	**WSP-32-F**
2	Stainless Steel	**WSP-32-SS**

One Piece Double Wide Shaft Collars

Metric Bores

Bore	Material	Part Number
6	Steel	**MWSP-6-F**
6	Stainless Steel	**MWSP-6-SS**
8	Steel	**MWSP-8-F**
8	Stainless Steel	**MWSP-8-SS**
10	Steel	**MWSP-10-F**
10	Stainless Steel	**MWSP-10-SS**
12	Steel	**MWSP-12-F**
12	Stainless Steel	**MWSP-12-SS**
16	Steel	**MWSP-16-F**
16	Stainless Steel	**MWSP-16-SS**
20	Steel	**MWSP-20-F**
20	Stainless Steel	**MWSP-20-SS**
25	Steel	**MWSP-25-F**
25	Stainless Steel	**MWSP-25-SS**

Quick Clamping Shaft Collars

Inch Bores

Bore	Material	Part Number
1/4	Anodized Aluminum	**QCL-4-A**
5/16	Anodized Aluminum	**QCL-5-A**
3/8	Anodized Aluminum	**QCL-6-A**
1/2	Anodized Aluminum	**QCL-8-A**
5/8	Anodized Aluminum	**QCL-10-A**
3/4	Anodized Aluminum	**QCL-12-A**
1	Anodized Aluminum	**QCL-16-A**
1 1/8	Anodized Aluminum	**QCL-18-A**
1 1/4	Anodized Aluminum	**QCL-20-A**
1 3/8	Anodized Aluminum	**QCL-22-A**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
1 1/2	Anodized Aluminum	**QCL-24-A**
1 5/8	Anodized Aluminum	**QCL-26-A**
1 3/4	Anodized Aluminum	**QCL-28-A**
1 7/8	Anodized Aluminum	**QCL-30-A**
2	Anodized Aluminum	**QCL-32-A**
2 1/8	Anodized Aluminum	**QCL-34-A**
2 1/4	Anodized Aluminum	**QCL-36-A**
2 3/8	Anodized Aluminum	**QCL-38-A**
2 1/2	Anodized Aluminum	**QCL-40-A**
2 5/8	Anodized Aluminum	**QCL-42-A**
2 3/4	Anodized Aluminum	**QCL-44-A**
2 7/8	Anodized Aluminum	**QCL-46-A**
3	Anodized Aluminum	**QCL-48-A**

Quick Clamping Shaft Collars

Metric Bores

Bore	Material	Part Number
6	Anodized Aluminum	**MQCL-6-A**
8	Anodized Aluminum	**MQCL-8-A**
10	Anodized Aluminum	**MQCL-10-A**
12	Anodized Aluminum	**MQCL-12-A**
14	Anodized Aluminum	**MQCL-14-A**
15	Anodized Aluminum	**MQCL-15-A**
16	Anodized Aluminum	**MQCL-16-A**
20	Anodized Aluminum	**MQCL-20-A**
25	Anodized Aluminum	**MQCL-25-A**
28	Anodized Aluminum	**MQCL-28-A**
30	Anodized Aluminum	**MQCL-30-A**
32	Anodized Aluminum	**MQCL-32-A**
35	Anodized Aluminum	**MQCL-35-A**
38	Anodized Aluminum	**MQCL-38-A**
40	Anodized Aluminum	**MQCL-40-A**
42	Anodized Aluminum	**MQCL-42-A**
45	Anodized Aluminum	**MQCL-45-A**
48	Anodized Aluminum	**MQCL-48-A**
50	Anodized Aluminum	**MQCL-50-A**
54	Anodized Aluminum	**MQCL-54-A**
55	Anodized Aluminum	**MQCL-55-A**
60	Anodized Aluminum	**MQCL-60-A**
65	Anodized Aluminum	**MQCL-65-A**
70	Anodized Aluminum	**MQCL-70-A**
75	Anodized Aluminum	**MQCL-75-A**

One Piece Threaded Shaft Collars

Inch Threads

Thread	Material	Part Number
#8-32	Steel	**TCL-2-32-F**
#8-32	Stainless Steel	**TCL-2-32-SS**
#10-24	Steel	**TCL-3-24-F**
#10-24	Stainless Steel	**TCL-3-24-SS**
#10-32	Steel	**TCL-3-32-F**
#10-32	Stainless Steel	**TCL-3-32-SS**
1/4-20	Steel	**TCL-4-20-F**
1/4-20	Stainless Steel	**TCL-4-20-SS**
1/4-28	Steel	**TCL-4-28-F**
1/4-28	Stainless Steel	**TCL-4-28-SS**
5/16-18	Steel	**TCL-5-18-F**
5/16-18	Stainless Steel	**TCL-5-18-SS**
5/16-24	Steel	**TCL-5-24-F**
5/16-24	Stainless Steel	**TCL-5-24-SS**
3/8-16	Steel	**TCL-6-16-F**
3/8-16	Stainless Steel	**TCL-6-16-SS**
3/8-24	Steel	**TCL-6-24-F**
3/8-24	Stainless Steel	**TCL-6-24-SS**
7/16-14	Steel	**TCL-7-14-F**
7/16-14	Stainless Steel	**TCL-7-14-SS**
7/16-20	Steel	**TCL-7-20-F**
7/16-20	Stainless Steel	**TCL-7-20-SS**
1/2-13	Steel	**TCL-8-13-F**
1/2-13	Stainless Steel	**TCL-8-13-SS**
1/2-20	Steel	**TCL-8-20-F**
1/2-20	Stainless Steel	**TCL-8-20-SS**
5/8-11	Steel	**TCL-10-11-F**
5/8-11	Stainless Steel	**TCL-10-11-SS**
5/8-18	Steel	**TCL-10-18-F**
5/8-18	Stainless Steel	**TCL-10-18-SS**
3/4-10	Steel	**TCL-12-10-F**
3/4-10	Stainless Steel	**TCL-12-10-SS**
3/4-16	Steel	**TCL-12-16-F**
3/4-16	Stainless Steel	**TCL-12-16-SS**
7/8-9	Steel	**TCL-14-9-F**
7/8-9	Stainless Steel	**TCL-14-9-SS**
7/8-14	Steel	**TCL-14-14-F**
7/8-14	Stainless Steel	**TCL-14-14-SS**
1-8	Steel	**TCL-16-8-F**
1-8	Stainless Steel	**TCL-16-8-SS**
1-12	Steel	**TCL-16-12-F**
1-12	Stainless Steel	**TCL-16-12-SS**

Ruland Shaft Collars Part Numbers

Thread	Material	Part Number
1-14	Steel	**TCL-16-14-F**
1-14	Stainless Steel	**TCL-16-14-SS**
1 1/8-7	Steel	**TCL-18-7-F**
1 1/8-7	Stainless Steel	**TCL-18-7-SS**
1 1/8-12	Steel	**TCL-18-12-F**
1 1/8-12	Stainless Steel	**TCL-18-12-SS**
1 1/4-7	Steel	**TCL-20-7-F**
1 1/4-7	Stainless Steel	**TCL-20-7-SS**
1 1/4-12	Steel	**TCL-20-12-F**
1 1/4-12	Stainless Steel	**TCL-20-12-SS**
1 3/8-6	Steel	**TCL-22-6-F**
1 3/8-6	Stainless Steel	**TCL-22-6-SS**
1 3/8-12	Steel	**TCL-22-12-F**
1 3/8-12	Stainless Steel	**TCL-22-12-SS**
1 1/2-6	Steel	**TCL-24-6-F**
1 1/2-6	Stainless Steel	**TCL-24-6-SS**
1 1/2-12	Steel	**TCL-24-12-F**
1 1/2-12	Stainless Steel	**TCL-24-12-SS**
1 3/4-16	Steel	**TCL-28-16-F**
1 3/4-16	Stainless Steel	**TCL-28-16-SS**
2-12	Steel	**TCL-32-12-F**
2-12	Stainless Steel	**TCL-32-12-SS**
2 1/4-12	Steel	**TCL-36-12-F**
2 1/4-12	Stainless Steel	**TCL-36-12-SS**

One Piece Threaded Shaft Collars

Metric Threads

Thread	Material	Part Number
M4x0.7	Steel	**MTCL-4-0.7-F**
M4x0.7	Stainless Steel	**MTCL-4-0.7-SS**
M5x0.8	Steel	**MTCL-5-0.8-F**
M5x0.8	Stainless Steel	**MTCL-5-0.8-SS**
M6x1	Steel	**MTCL-6-1-F**
M6x1	Stainless Steel	**MTCL-6-1-SS**
M8x1.25	Steel	**MTCL-8-1.25-F**
M8x1.25	Stainless Steel	**MTCL-8-1.25-SS**
M10x1.5	Steel	**MTCL-10-1.5-F**
M10x1.5	Stainless Steel	**MTCL-10-1.5-SS**
M12x1.75	Steel	**MTCL-12-1.75-F**
M12x1.75	Stainless Steel	**MTCL-12-1.75-SS**
M16x2	Steel	**MTCL-16-2-F**
M16x2	Stainless Steel	**MTCL-16-2-SS**
M20x2.5	Steel	**MTCL-20-2.5-F**
M20x2.5	Stainless Steel	**MTCL-20-2.5-SS**
M24x3	Steel	**MTCL-24-3-F**
M24x3	Stainless Steel	**MTCL-24-3-SS**
M30x3.5	Steel	**MTCL-30-3.5-F**
M30x3.5	Stainless Steel	**MTCL-30-3.5-SS**

Two Piece Threaded Shaft Collars

Inch Threads

Thread	Material	Part Number
#8-32	Steel	**TSP-2-32-F**
#8-32	Stainless Steel	**TSP-2-32-SS**
#10-24	Steel	**TSP-3-24-F**
#10-24	Stainless Steel	**TSP-3-24-SS**
#10-32	Steel	**TSP-3-32-F**
#10-32	Stainless Steel	**TSP-3-32-SS**
1/4-20	Steel	**TSP-4-20-F**
1/4-20	Stainless Steel	**TSP-4-20-SS**
1/4-28	Steel	**TSP-4-28-F**
1/4-28	Stainless Steel	**TSP-4-28-SS**
5/16-18	Steel	**TSP-5-18-F**
5/16-18	Stainless Steel	**TSP-5-18-SS**
5/16-24	Steel	**TSP-5-24-F**
5/16-24	Stainless Steel	**TSP-5-24-SS**
3/8-16	Steel	**TSP-6-16-F**
3/8-16	Stainless Steel	**TSP-6-16-SS**
3/8-24	Steel	**TSP-6-24-F**
3/8-24	Stainless Steel	**TSP-6-24-SS**
7/16-14	Steel	**TSP-7-14-F**
7/16-14	Stainless Steel	**TSP-7-14-SS**
7/16-20	Steel	**TSP-7-20-F**
7/16-20	Stainless Steel	**TSP-7-20-SS**
1/2-13	Steel	**TSP-8-13-F**
1/2-13	Stainless Steel	**TSP-8-13-SS**
1/2-20	Steel	**TSP-8-20-F**
1/2-20	Stainless Steel	**TSP-8-20-SS**
5/8-11	Steel	**TSP-10-11-F**
5/8-11	Stainless Steel	**TSP-10-11-SS**
5/8-18	Steel	**TSP-10-18-F**
5/8-18	Stainless Steel	**TSP-10-18-SS**
3/4-10	Steel	**TSP-12-10-F**
3/4-10	Stainless Steel	**TSP-12-10-SS**
3/4-16	Steel	**TSP-12-16-F**
3/4-16	Stainless Steel	**TSP-12-16-SS**
7/8-9	Steel	**TSP-14-9-F**
7/8-9	Stainless Steel	**TSP-14-9-SS**

Ruland Shaft Collars Part Numbers

Thread	Material	Part Number
7/8-14	Steel	**TSP-14-14-F**
7/8-14	Stainless Steel	**TSP-14-14-SS**
1-8	Steel	**TSP-16-8-F**
1-8	Stainless Steel	**TSP-16-8-SS**
1-12	Steel	**TSP-16-12-F**
1-12	Stainless Steel	**TSP-16-12-SS**
1-14	Steel	**TSP-16-14-F**
1-14	Stainless Steel	**TSP-16-14-SS**
1 1/8-7	Steel	**TSP-18-7-F**
1 1/8-7	Stainless Steel	**TSP-18-7-SS**
1 1/8-12	Steel	**TSP-18-12-F**
1 1/8-12	Stainless Steel	**TSP-18-12-SS**
1 1/4-7	Steel	**TSP-20-7-F**
1 1/4-7	Stainless Steel	**TSP-20-7-SS**
1 1/4-12	Steel	**TSP-20-12-F**
1 1/4-12	Stainless Steel	**TSP-20-12-SS**
1 3/8-6	Steel	**TSP-22-6-F**
1 3/8-6	Stainless Steel	**TSP-22-6-SS**
1 3/8-12	Steel	**TSP-22-12-F**
1 3/8-12	Stainless Steel	**TSP-22-12-SS**
1 1/2-6	Steel	**TSP-24-6-F**
1 1/2-6	Stainless Steel	**TSP-24-6-SS**
1 1/2-12	Steel	**TSP-24-12-F**
1 1/2-12	Stainless Steel	**TSP-24-12-SS**
1 3/4-16	Steel	**TSP-28-16-F**
1 3/4-16	Stainless Steel	**TSP-28-16-SS**
2-12	Steel	**TSP-32-12-F**
2-12	Stainless Steel	**TSP-32-12-SS**
2 1/4-12	Steel	**TSP-36-12-F**
2 1/4-12	Stainless Steel	**TSP-36-12-SS**

Set Screw Shaft Collars

Inch Bores

Bore	Material	Part Number
3/16	Steel	**SC-3-F**
3/16	Aluminum	**SC-3-A**
3/16	Stainless Steel	**SC-3-SS**
3/16	Plastic	**SC-3-P**
1/4	Steel	**SC-4-F**
1/4	Aluminum	**SC-4-A**
1/4	Stainless Steel	**SC-4-SS**
1/4	Plastic	**SC-4-P**
5/16	Steel	**SC-5-F**
5/16	Aluminum	**SC-5-A**
5/16	Stainless Steel	**SC-5-SS**
5/16	Plastic	**SC-5-P**
3/8	Steel	**SC-6-F**
3/8	Aluminum	**SC-6-A**
3/8	Stainless Steel	**SC-6-SS**
3/8	Plastic	**SC-6-P**
7/16	Steel	**SC-7-F**
7/16	Aluminum	**SC-7-A**
7/16	Stainless Steel	**SC-7-SS**
7/16	Plastic	**SC-7-P**
1/2	Steel	**SC-8-F**
1/2	Aluminum	**SC-8-A**
1/2	Stainless Steel	**SC-8-SS**
1/2	Plastic	**SC-8-P**
9/16	Steel	**SC-9-F**
9/16	Aluminum	**SC-9-A**
9/16	Stainless Steel	**SC-9-SS**
9/16	Plastic	**SC-9-P**
5/8	Steel	**SC-10-F**
5/8	Aluminum	**SC-10-A**
5/8	Stainless Steel	**SC-10-SS**
5/8	Plastic	**SC-10-P**
11/16	Steel	**SC-11-F**
11/16	Aluminum	**SC-11-A**
11/16	Stainless Steel	**SC-11-SS**
11/16	Plastic	**SC-11-P**
3/4	Steel	**SC-12-F**
3/4	Aluminum	**SC-12-A**
3/4	Stainless Steel	**SC-12-SS**
3/4	Plastic	**SC-12-P**
13/16	Steel	**SC-13-F**
13/16	Stainless Steel	**SC-13-SS**
7/8	Steel	**SC-14-F**
7/8	Stainless Steel	**SC-14-SS**
15/16	Steel	**SC-15-F**
15/16	Stainless Steel	**SC-15-SS**
1	Steel	**SC-16-F**
1	Stainless Steel	**SC-16-SS**
1 1/16	Steel	**SC-17-F**
1 1/16	Stainless Steel	**SC-17-SS**
1 1/8	Steel	**SC-18-F**
1 1/8	Stainless Steel	**SC-18-SS**
1 3/16	Steel	**SC-19-F**
1 3/16	Stainless Steel	**SC-19-SS**
1 1/4	Steel	**SC-20-F**

Ruland Shaft Collars Part Numbers

Bore	Material	Part Number
1 1/4	Stainless Steel	**SC-20-SS**
1 5/16	Steel	**SC-21-F**
1 5/16	Stainless Steel	**SC-21-SS**
1 3/8	Steel	**SC-22-F**
1 3/8	Stainless Steel	**SC-22-SS**
1 7/16	Steel	**SC-23-F**
1 7/16	Stainless Steel	**SC-23-SS**
1 1/2	Steel	**SC-24-F**
1 1/2	Stainless Steel	**SC-24-SS**
1 9/16	Steel	**SC-25-F**
1 9/16	Stainless Steel	**SC-25-SS**
1 5/8	Steel	**SC-26-F**
1 5/8	Stainless Steel	**SC-26-SS**
1 11/16	Steel	**SC-27-F**
1 11/16	Stainless Steel	**SC-27-SS**
1 3/4	Steel	**SC-28-F**
1 3/4	Stainless Steel	**SC-28-SS**
1 13/16	Steel	**SC-29-F**
1 13/16	Stainless Steel	**SC-29-SS**
1 7/8	Steel	**SC-30-F**
1 7/8	Stainless Steel	**SC-30-SS**
1 15/16	Steel	**SC-31-F**
1 15/16	Stainless Steel	**SC-31-SS**
2	Steel	**SC-32-F**
2	Stainless Steel	**SC-32-SS**
2 1/16	Steel	**SC-33-F**
2 1/16	Stainless Steel	**SC-33-SS**
2 1/8	Steel	**SC-34-F**
2 1/8	Stainless Steel	**SC-34-SS**
2 3/16	Steel	**SC-35-F**
2 3/16	Stainless Steel	**SC-35-SS**
2 1/4	Steel	**SC-36-F**
2 1/4	Stainless Steel	**SC-36-SS**
2 5/16	Steel	**SC-37-F**
2 5/16	Stainless Steel	**SC-37-SS**
2 3/8	Steel	**SC-38-F**
2 3/8	Stainless Steel	**SC-38-SS**
2 7/16	Steel	**SC-39-F**
2 7/16	Stainless Steel	**SC-39-SS**
2 1/2	Steel	**SC-40-F**
2 1/2	Stainless Steel	**SC-40-SS**
2 9/16	Steel	**SC-41-F**
2 9/16	Stainless Steel	**SC-41-SS**
2 5/8	Steel	**SC-42-F**
2 5/8	Stainless Steel	**SC-42-SS**

Bore	Material	Part Number
2 11/16	Steel	**SC-43-F**
2 11/16	Stainless Steel	**SC-43-SS**
2 3/4	Steel	**SC-44-F**
2 3/4	Stainless Steel	**SC-44-SS**
2 13/16	Steel	**SC-45-F**
2 13/16	Stainless Steel	**SC-45-SS**
2 7/8	Steel	**SC-46-F**
2 7/8	Stainless Steel	**SC-46-SS**
2 15/16	Steel	**SC-47-F**
2 15/16	Stainless Steel	**SC-47-SS**
3	Steel	**SC-48-F**
3	Stainless Steel	**SC-48-SS**
3 1/16	Steel	**SC-49-F**
3 1/8	Steel	**SC-50-F**
3 3/16	Steel	**SC-51-F**
3 1/4	Steel	**SC-52-F**
3 5/16	Steel	**SC-53-F**
3 3/8	Steel	**SC-54-F**
3 7/16	Steel	**SC-55-F**
3 1/2	Steel	**SC-56-F**
3 9/16	Steel	**SC-57-F**
3 5/8	Steel	**SC-58-F**
3 11/16	Steel	**SC-59-F**
3 3/4	Steel	**SC-60-F**
3 13/16	Steel	**SC-61-F**
3 7/8	Steel	**SC-62-F**
3 15/16	Steel	**SC-63-F**
4	Steel	**SC-64-F**

Shaft Collar, 1/2 Hex

This shaft collar is a 1-piece, hex bore shaft collar. It can be slid from the end of a shaft to where it is needed.

PRIOR USAGE

Used to hold parts in place on 1/2" hex shafts.

F/C

Category

VEX PRO

Supplier*

217-2737

Part Number

FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Collar, 1/2 Round

This shaft collar is a 1-piece, round bore shaft collar. It can be slid from the end of a shaft to where it is needed.

PRIOR USAGE

Used to hold parts in place on 1/2" round shafts.

F/C

Category

VEX PRO

Supplier*

217-2736

Part Number

FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Collar, 3/8 Hex

This shaft collar is a 1-piece, hex bore shaft collar. It can be slid from the end of a shaft to where it is needed.

PRIOR USAGE

Not Used

Category

Supplier*

217-2739

Part Number

FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Collar, 3/8 Round

This shaft collar is a 1-piece, round bore shaft collar. It can be slid from the end of a shaft to where it is needed.

PRIOR USAGE

Not Used

F/C

Category

VEX PRO

Supplier*

217-2738

Part Number

FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Collar, 8mm Round

This shaft collar is a 1-piece, round bore shaft collar. It can be slid from the end of a shaft to where it is needed. It is the right side for CIM and MiniCIM motor shafts.

PRIOR USAGE

Used to hold parts in place on 8mm round shafts.

F/C

Category

VEX PRO

Supplier*

217-2744

Part Number

FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Coupler, 1/2 Hex

This shaft coupler will connect two 1/2" hex shafts. It is a two-piece coupler that can be taken apart and added in the middle of a shaft.

PRIOR USAGE

Not Used

Category

Supplier*

217-4008

Part Number

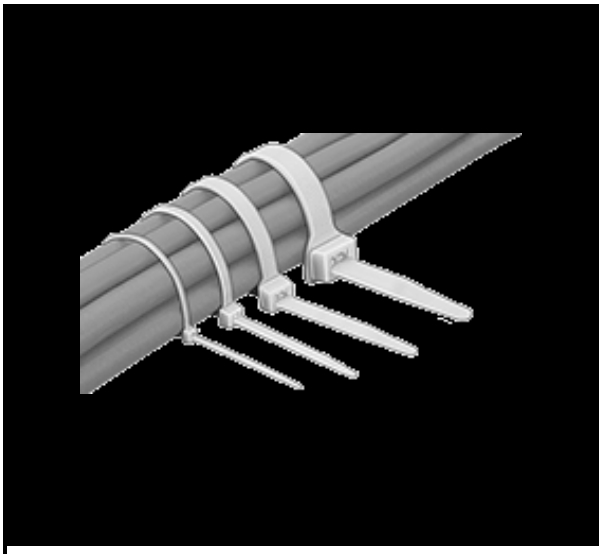
FINAL NOTES

The set screw can be tightened with a 3/32" hex screwdriver.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Zip Ties

Zip Ties are an essential part of every robot. They hold things in place without coming undone or leaving residue. The most common area is mounting electronic components and managing wires. The thinnest zip ties are used for mounting most components, as they can fit through the mounting holes. Medium sized zip ties are used for wire management and for holding down components that are designed to be attached with them (i.e. the RoboRIO) or components without mounting holes. The larger zip ties are used for mechanical connections and for holding large objects together.



F/C

Category

McMASTER

Supplier*

See Next Page

Part Number

PRIOR USAGE

Don't Get Me Started

FINAL NOTES

Always have a large supply of zip ties, they get used up quickly. The three most common sizes we purchase are highlighted in the chart on the next page.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

McMaster-Carr Zip Ties Part Numbers

Narrow (0.09-0.10" Wide)

Length	Breaking Strength	Pkg. Qty.	Part # (White)	Part # (Black)
3"	10 lbs	100	**7310K101**	**7130K102**
4"	10 lbs	100	**7130K12**	**7130K52**
6"	10 lbs	100	**7130K41**	**7130K42**
8"	10 lbs	100	**7130K31**	**7130K32**

Standard (0.14-0.19" Wide)

Length	Breaking Strength	Pkg. Qty.	Part # (White)	Part # (Black)
5 1/2"	40 lbs	100	**7130K13**	**7130K53**
5 1/2"	50 lbs	100	**7130K47**	**7130K48**
7 1/2"	50 lbs	100	**7130K19**	**7130K59**
8"	70 lbs	100	**80005K11**	**80005K51**
8 1/2"	40 lbs	100	**7130K14**	**7130K54**
11"	50 lbs	100	**7130K15**	**7130K55**
11"	70 lbs	100	**80005K12**	**80005K52**
14"	70 lbs	100	**80005K13**	**80005K53**
14 1/2"	50 lbs	50	**7130K16**	**7130K56**
17"	50 lbs	50	**7130K21**	**7130K61**
21 1/2"	50 lbs	50	**7130K105**	**7130K106**

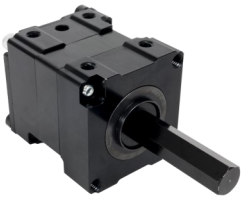
Wide (0.30-0.36" Wide)

Length	Breaking Strength	Pkg. Qty.	Part # (White)	Part # (Black)
8 1/2"	120 lbs	50	**7130K43**	**7130K44**
12"	120 lbs	50	**7130K45**	**7130K46**
15"	120 lbs	50	**7130K172**	**7130K572**
17"	170 lbs	10	**80005K44**	**80005K54**
18"	120 lbs	50	**7130K49**	**7130K51**
21"	170 lbs	10	**80005K45**	**80005K55**
21 1/2"	120 lbs	10	**7130K33**	**7130K68**
24"	120 lbs	25	**7130K912**	**7130K922**
24"	170 lbs	10	**80005K46**	**80005K56**
28"	120 lbs	10	**7130K932**	**7130K942**
32"	170 lbs	25	**80005K27**	**80005K28**
37"	170 lbs	25	**7130K22**	**7130K62**
41"	170 lbs	10	**7130K242**	**7130K642**
45 1/2"	170 lbs	10	**7130K34**	**7130K66**
48"	170 lbs	10	**7130K252**	**7130K652**
60"	170 lbs	5	**7130K81**	-

McMaster-Carr Zip Ties Part Numbers

Extra Wide (0.50" Wide)

Length	Breaking Strength	Pkg. Qty.	Part # (White)	Part # (Black)
9"	250 lbs	25	**69455K11**	**69455K12**
15"	250 lbs	25	**69455K21**	**69455K41**
22"	250 lbs	10	**69455K22**	**69455K42**
28 1/2"	250 lbs	10	**69455K23**	**69455K43**
34 1/2"	250 lbs	10	**69455K24**	**69455K44**



GB

Gearboxes

Gearbox Parts

2-CIM Ball Shifter

The 2-CIM Ball Shifter is a shifting gearbox. It is completely enclosed, barring swarf from affecting the gearbox. It has a mounting system that interfaces with VersaFrame.

PRIOR USAGE

Not Used

GB

Category

VEX PRO

Supplier*

217-2428 (2 Stage)

217-2615 (3 Stage)

Part Number

FINAL NOTES

Shifting gearboxes are a useful part of any high-quality robot, allowing it to rush across the field and then pick up a game element with high precision.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

3-CIM Ball Shifter

The 3-CIM Ball Shifter is a shifting gearbox. It is completely enclosed, barring swarf from affecting the gearbox. It has a mounting system that interfaces with VersaFrame.

PRIOR USAGE

Not Used

GB

Category

VEX PRO

Supplier*

217-3195 (2 Stage)
217-3268 (3 Stage)
217-3269 (3 Stage WCD)
Part Number

FINAL NOTES

Shifting gearboxes are a useful part of any high-quality robot, allowing it to rush across the field and then pick up a game element with high precision.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

57 Sport Gearbox

The 57 Sport is a planetary gearbox, similar to the BaneBots P60 gearbox. They all have 1/2" hex output shafts. They are extremely resilient and are guaranteed to not fail in competition. There is an HD stage at the output end of the three stage versions (64:1, 80:1 and 100:1), giving the gearbox more strength to handle heavy or cantilevered loads.

PRIOR USAGE

Not Used

Category

Supplier*

4:1	am-3658	64:1	am-3756
16:1	am-3754	80:1	am-3757
20:1	am-3755	100:1	am-3758

Part Numbers

FINAL NOTES

Every gearbox comes with a free packet of grease. All inner surfaces of the gearbox must be greased prior to use.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ball Shifter Mag Encoder Mount

The Ball Shifter Mag Encoder Mount allows a SRX Mag Encoder to be mounted on a 2- or 3-CIM Ball Shifter.

PRIOR USAGE

Not Used

GB

Category

Supplier*

217-5906

Part Number

FINAL NOTES

It is much faster to 3D print this part rather than purchase it. The CAD file is available on the part page.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bolt, #10-32 x 5/8" with Nylock

These bolts are specifically used for connecting CIMs and MiniCIMs to gearboxes. Two are used for each motor. Toughbox Minis have holes in the mounting plate to allow access to the mounting bolts.

PRIOR USAGE

Literally any time we connected a CIM or MiniCIM to a Gearbox.

GB

Category

Supplier*

am-1120 (bulk)

Part Number

FINAL NOTES

These are included in all Toughbox Mini kits, but it is wise to have spares on hand for when an extra motor needs to be attached to a gearbox or if the gearbox did not come with them. A 5/32 Allen wrench is needed to tighten these.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIM Gear, 12T

This gear is attached to the 8mm shaft of a CIM, MiniCIM or VP with CIM Output to interface the motor with a AM Shifter, Super Shifter, or CIMple gearbox. This is NOT the gear used with Toughbox series gearboxes. This interfaces with a 56T gear in a CIMple gearbox.

PRIOR USAGE

Drive Train | Recyclops | 2015

Recyclops used 4 CIMple gearboxes with one CIM each (4 input gears).

Category

Supplier*

am-0741

Part Number

FINAL NOTES

Remember that this is not a Toughbox input gear. When attaching to a shaft, use three 5/16 washers, the gear and machine key, then another washer and finally the 8mm retaining ring.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIM Gear, 14T

This gear is attached to the 8mm shaft of a CIM, MiniCIM or VP with CIM Output to interface the motor with a 3CIM4U, Nano Tube, or Toughbox series gearbox. This is NOT the gear used with CIMple gearboxes. This interfaces with a 50T gear.

PRIOR USAGE

Drive Train | Sparky | 2016

Sparky had two Toughbox Mini gearboxes with two CIMs each (4 input gears).

Drive Train | Heart of the Beast | 2017

The Heart of the Beast had four Toughbox Mini gearboxes, first driven by one MiniCIM each (4 input gears), then two by one CIM each and two by two MiniCIMs each (6 input gears).

GB

Category

AndyMark

Supplier*

am-0034

Part Number

FINAL NOTES

Remember that this is not a CIMple input gear. When attaching to a shaft, use three 5/16 washers, the gear and machine key, then another washer and finally the 8mm retaining ring.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIM Sport Gearbox

The CIM Sport is a planetary gearbox, similar to a VersaPlanetary with a CIM Adapter. They all have 1/2" hex output shafts. They are extremely resilient and are guaranteed to not fail in competition. There is an HD stage at the output end of the three stage versions (36:1, 48:1 and 64:1), giving the gearbox more strength to handle heavy or cantilevered loads.

PRIOR USAGE

Not Used

GB

Category

AndyMark

Supplier*

4:1	**am-3759**	**36:1**	**am-3762**
12:1	**am-3760**	**48:1**	**am-3763**
16:1	**am-3761**	**64:1**	**am-3764**

Part Numbers

FINAL NOTES

Every gearbox comes with a free packet of grease. All inner surfaces of the gearbox must be greased prior to use.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIM-ile

The CIM-ile allows you to use a RS-5xx or RS-7xx series motor to emulate the output speed, torque, shaft and mounting holes of a 2.5" CIM.

PRIOR USAGE

Not Used

Category

Supplier*

217-3198

Part Number

FINAL NOTES

The CIM-ile can help save space on your robot, but be warned that RS-550 and RS-775 motors can burn out easily without amperage control (achieved via code). Also, the CIM-ile by itself is more expensive than a 2.5" CIM.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

External Klipring, 1/2"

This Klipring is used in gearboxes such as the Toughbox Mini to prevent the output shaft from sliding out of the gearbox.

PRIOR USAGE

Every time we assembled a Toughbox Mini.

Category

Supplier*

am-0206

Part Number

FINAL NOTES

All Toughbox-series gearboxes use this to hold in the output shaft. These are cheap and come in every Toughbox-series kit.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Grease

PRIOR USAGE

GB

Category

AndyMark

Supplier*

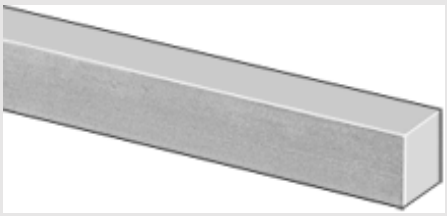
am-2768

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Key Stock, 1/8"



PRIOR USAGE

GB

Category

McMASTER

Supplier*

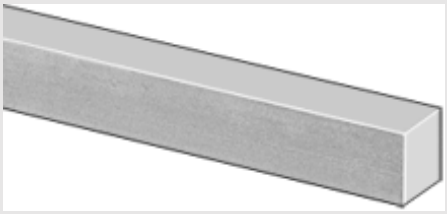
98510A100

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Key Stock, 2mm



PRIOR USAGE

GB

Category

McMASTER

Supplier*

92288A710

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

P60 Gearbox

P60 gearboxes are used with RS-550 and RS-775 motors. 775pro motors work as well. They can come in 1-4 stages and have pre-made gear ratios from 3:1 to 256:1 and theoretical gear ratios up to 672:1. We use the P60 gearboxes that can be used with either 500 or 700 series motors so they can be used in the future. Each stage is either 3:1**, 4:1 or 5:1***. Preassembled gearboxes or individual parts can be bought. Be sure that the carrier plate matches with the prior stage and that the pinion gear on the motor matches with the first stage.**

** Up to 672:1 for RS-550 motors only – only 550s can fit a 5:1 pinion gear and BaneBots does not sell 4:1 planet to 5:1 sun carrier plates (or 3:1 to 4:1) because reduction stages should only go from higher to lower

*** 3:1 reductions are actually 3.37:1

**** 5:1 reductions are actually 5.09:1

Category GB

Supplier* BB

Stages	Preassembled Gearbox Part #	x: stage ratio
1	P60S-x-57	3:1 – 3
2	P60S-xx-57	4:1 – 4
3	P60S-xxx-57	
4	P60S-xxxx-57	

Individual Parts: ***See Next Page***

PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm was run with a 256:1 P60 gearbox run by a RS-775-18 motor.

Intake | Sparky | 2016

Sparky's intake was run with a 16:1 P60 gearbox run by a RS-550 motor.

Climber | Heart of the Beast | 2017

The Heart of the Beast had a 256:1 P60 gearbox run by a 775pro motor.

Gear Mechanism (Original) | Heart of the Beast | 2017

The Heart of the Beast had a 256:1 P60 gearbox run by a RS-550 motor.

Intake | Heart of the Beast | 2017

The Heart of the Beast had a 4:1 P60 gearbox run by a 775pro motor.

FINAL NOTES

P60 gearboxes are usable anywhere on a robot. Try not to lose the gears during disassembly. When stalled, the gears will likely break, mostly in the second stage. The mounting holes are 10-32. Also, they need to be greased before use.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

BaneBots P60 Parts List

Mounting Kits

Motor Series	Pinion Ratio	Part #
RS-500/700	3:1	**P60B-H573**
RS-500/700	4:1	**P60B-H574**
RS-500	5:1	**P60B-H55**

Includes mounting screws, pinion, lock washers

Pinions

Motor Series	First Stage Ratio	Part #
RS-500	3:1	**P60P-GM53**
RS-500	4:1	**P60P-GM54**
RS-500	5:1	**P60P-GM55**
RS-700	3:1	**P60P-GM73**
RS-700	4:1	**P60P-GM74**

Shafts

Width	Length	Part #
1/2"	1-1/2"	**P60P-S1-H414KT**
1/2"	3"	**P60P-S1-H430KT**
3/8"	1-1/2"	**P60P-S2-P314KT**
3/8"	3"	**P60P-S2-P330KT**

Planet Gears

Ratio	Teeth Number	Part #
3:1	13	**P60P-GP3**
4:1	15	**P60P-GP4**
5:1	17	**P60P-GP5**

Carrier Plates

Planet Ratio	Output	Part #
3:1	Shaft	**P60P-C30**
3:1	3:1	**P60P-C33**
4:1	Shaft	**P60P-C40**
4:1	3:1	**P60P-C43**
4:1	4:1	**P60P-C44**
5:1	Shaft	**P60P-C50**
5:1	3:1	**P60P-C53**
5:1	4:1	**P60P-C54**
5:1	5:1	**P60P-C55**

Ringgears

# of Stages	Material	Part #
1	Aluminum	**P60P-GR1-A**
1	Plated Steel	**P60P-GR1-SP**
2	Aluminum	**P60P-GR2-A**
2	Plated Steel	**P60P-GR2-SP**
3	Aluminum	**P60P-GR3-A**
3	Plated Steel	**P60P-GR3-SP**
4	Aluminum	**P60P-GR4-A**
4	Plated Steel	**P60P-GR4-SP**

Blocks

End of GB	Part #
Front (Shaft)	**P60P-F1-SM**
Back (Motor)	**P60P-B57-SM**

Bearing Blocks

Shaft Size	Part #
1/2"	**PB-S5001-BB-1**
3/8"	**PB-S3751-BB-1**

Assembly Screws

# of Stages	Part #
1	**P60P-H1**
2	**P60P-H2**
3	**P60P-H3**
4	**P60P-H4**

Other Hardware

Part	Part #
Shaft Shim, 0.020 Thick	**P60P-M1**
External Retaining Ring, 3/8"	**P60P-R1**
Wear Washer	**P60P-W1**

PG Series Gearbox

The PG Series Gearbox comes in 3 sizes, the PG27, PG71 and PG188. Each gearbox has two output shaft options. Each gearbox can be bought with or without the RS775-125 motor (for PG27) or RS775-5 motor (for PG71 & PG188). Older styles of the gearbox used a 10mm output shaft, which would require an adapter (am-0996) to change the output to 1/2" round (with built-in key). The Planetary GearMotor Bracket (am-2197) can be used to mount the gearbox.

PRIOR USAGE

Agitator | Heart of the Beast | 2017

The agitator on the Heart of the Beast used a PG71 Gearmotor with RS775-5 motor with encoder to agitate the fuel tank.

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

PG Series Gearmotors with an integrated encoder come with screw terminals to connect power, making it an ideal choice for a last-minute addition of a motor, like for an agitator.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PG Series Gearbox Part Numbers

PG27

Output	Motor	Part #
3/8" Hex	-	**am-3651g**
3/8" Hex	RS775-125 w/ encoder (am-3109)	**am-3651**
1/2" Hex	-	**am-3654g**
1/2" Hex	RS775-125 w/ encoder (am-3109)	**am-3654**

PG71

Output	Motor	Part #
3/8" Hex	-	**am-3652g**
3/8" Hex	RS775-5 w/ encoder (am-3108)	**am-3652**
1/2" Hex	-	**am-3655g**
1/2" Hex	RS775-5 w/ encoder (am-3108)	**am-3655**

PG188

Output	Motor	Part #
3/8" Hex	-	**am-3653g**
3/8" Hex	RS775-5 w/ encoder (am-3108)	**am-3653**
1/2" Hex	-	**am-3656g**
1/2" Hex	RS775-5 w/ encoder (am-3108)	**am-3656**

Retaining Ring, 8mm

This retaining ring is used with CIM and MiniCIM motors to keep the gears, washers and machine key from falling off of the shaft.

PRIOR USAGE

Every time a CIM or MiniCIM was used in a gearbox.

GB

Category

AndyMark

Supplier*

am-0033

Part Number

FINAL NOTES

When adding the gear to connect to a Toughbox Mini, use three washers, the gear (with the key), another washer and then the 8mm ring. This ensures it will not rub against the gearbox housing and that the key will not fall out.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Toughbox Mini

Toughbox Mini gearboxes have been in the KoP since 2014. They come in four gear ratios: 5.95:1, 8.45:1, 10.71:1 and 12.75:1. The KoP gearboxes have been 12.75:1. Toughbox Minis have flat and angled mounting plate options. The Toughbox Mini is a smaller and lighter version of the original Toughbox.

PRIOR USAGE

Drive Train | Sparky | 2016

Sparky's drive train had two 12.75:1 gearboxes – one for each side of the robot. Each gearbox was driven by two CIM motors. The wheels were connected with belts.

Drive Train | Heart of the Beast | 2017

The Heart of the beast had four 5.95:1 gearboxes, one for each wheel. The gear-side gearboxes were driven by one CIM each and the intake-side gearboxes were driven by two MiniCIMs each. The wheels were connected with belts.

Category	Supplier*
am-2307 (5.95:1)	am-2306 (8.45:1)
am-2305 (10.71:1)	am-0654 (12.75:1)

Part Number (Angled Plate)

FINAL NOTES

Toughbox Minis are a go-to gearbox for our team. They take up a lot of space, so we may want to consider Toughbox Micros or other smaller gearboxes in the future. Be sure to grease the gearbox before use.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaPlanetary CIM Adapter

The VersaPlanetary CIM Adapter allows you to connect a CIM motor to a VersaPlanetary.

PRIOR USAGE

Shooter (Prototype) | Heart of the Beast | 2017

One of the early prototypes for the shooter used a CIM motor with a VersaPlanetary so the RPM could be measured

GB

Category

Supplier*

217-4018

Part Number

FINAL NOTES

Connect the adapter to the gearbox before connecting it to the motor because the screws for the gearbox are inaccessible once the motor is mounted.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VP Dual Motor Input

The VersaPlanetary Dual Motor Input allows the use of two RS-550, RS-775 and/or 775pro motors on one gearbox.

PRIOR USAGE

Not Used

GB

Category

Supplier*

217-3141

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaPlanetary

The VersaPlanetary Gearbox is a very versatile and customizable gearbox. Its stages are sold separately and can be mixed and matched to give the desired performance. The VP Integrated Encoder is just like another stage and will measure the speed of the gearbox rotation. A ratcheting stage is also available. There is a 180° Drive kit that allows the motor to be located alongside the gearbox, saving space. There are four male and four female output shaft options, and has the capability to connect to a BAG, RS-550, RS-775, 775pro, or AM-9015 motor, and with an adapter, to a CIM or MiniCIM. With the Dual Motor Input two RS-550, RS-775 or 775pro motors can be used together.

PRIOR USAGE

Shooter | Heart of the Beast | 2017

The shooter on the Heart of the Beast used a VersaPlanetary, exclusively for the reason that the gearbox could have an integrated encoder and still have a 1:1 reduction ratio.

GB

Category

VEX PRO

Supplier*

See Next Page

Part Number

FINAL NOTES

The versatility of the VersaPlanetary sets it apart from BaneBots P60 gearboxes because if a stage fails, only the stage would need to be replaced instead of the whole gearbox. Also, the stages come in 3:, 4:, 5:, 7:, 9:, and 10:1 ratios, unlike P60 gearboxes. Ring gears are sold separately from gear kits. VEX has a handy document with charts of what reductions you can use with different motors.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaPlanetary Parts List

Base Kits

Output Shaft Size	Part #
1/2" Hex	**217-4973**
3/8" Hex	**217-4974**
1/2" Keyed Round	**217-4975**
8mm Keyed Round (CIM)	**217-4976**

Includes Input Housing, Output Housing, Mounting Kit, Mounting Plates

Reduction Stages

Ratio	Part #
Ring Gear Kit	**217-2816**
3:1	**217-2817**
4:1	**217-2818**
5:1	**217-2819**
7:1	**217-3102**
9:1	**217-3106**
10:1	**217-2820**

A Ring Gear Kit is required for each stage

Alternate Input Options

Input Type	Part #
CIM	**217-4018**
Dual 550/775	**217-3141**

Output Shafts

Output Shaft Size	Part #
1/2" Hex	**217-2895**
3/8" Hex	**217-2894**
1/2" Keyed Round	**217-2897**
8mm Keyed Round (CIM)	**217-2893**
Female Output Shaft Kit	**217-5839**

Extras

Name	Part #
180° Drive	**217-6011**
Ratchet Kit	**217-6048**
Integrated Encoder	**217-5046**
Motor Mounting Hardware Kit	**217-4649**
Motor Mounting Plates Set	**217-3564**

Washer, 5/16"

These washers are used on the shaft of a CIM or MiniCIM motor to space the gear apart from the motor and retaining ring.

PRIOR USAGE

GB

Category

AndyMark

Supplier*

am-1009 (bulk)

Part Number

FINAL NOTES

The best way to mount a gear is 3 washers, a gear, another washer, and then the retaining ring. This prevents the gear from rubbing against the input shaft hole in the gearbox housing. This does require more washers than are provided with the gearbox kit.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

ME

Metal Parts

550 Vent Plate Spacer

This spacer is placed between the gearbox and the motor. COTS gearboxes usually will not need this.

PRIOR USAGE

Not Used

Category

Supplier*

am-3649

Part Number

FINAL NOTES

This likely would only be useful if we create a custom gearbox that uses a high power 550-class motor.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

775 Vent Plate Spacer

This spacer is placed between the gearbox and the motor. COTS gearboxes usually will not need this, but it may not be a bad idea with a RedLine motor.

PRIOR USAGE

Not Used

ME

Category

AndyMark

Supplier*

am-3650

Part Number

FINAL NOTES

This likely will only be useful if we create a custom gearbox or use a RedLine motor.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

AM14U3 End Plate

The AM14U3 End Plate is from the KoP Drive Base Kit from 2016-7. The 2014-2015 Drive Base Kits had similar parts. The holes are the correct size for 10-32 bolts. It has two rows of holes along the top 1" apart and one row on the bottom. The holes are ½" apart.

PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm used part of an AM14U3 End Plate to hold its 256:1 P60 gearbox and RS-775-18 motor.

Climber | Heart of the Beast | 2017

The Heart of the Beast used part of an AM14U3 End Plate to hold its 256:1 P60 gearbox and 775pro motor.

Shooter | Heart of the Beast | 2017

The Heart of the Beast's shooter had a part of an AM14U3 End Plate to guide fuel into the shooter. It was agitated with a PG71 gearbox run by an AndyMark RS-775. The second row of holes on the top was cut off to even the sides.

ME

Category

AndyMark

Supplier*

am-2953a

Part Number

FINAL NOTES

The AM14U3 End Plate is useful for raising parts up ≈1". The holes will need to be drilled out to accommodate ¼-20 bolts.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

AM14U3 Inside Plate

This is the inner plate from the AM14U3 Drive Base Kit.

PRIOR USAGE

Not Used

Category

Supplier*

am-2952a

Part Number

FINAL NOTES

Outside of creating a AM14U3 drive base, this part has few uses. One possible use is using the large holes to hold flanged bearings (as they are meant to on the drive base).

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

AM14U3 Outer Plate

This is the outer plate from the AM14U3 Drive Base Kit.

PRIOR USAGE

Not Used

ME

Category

AndyMark

Supplier*

am-2951a

Part Number

FINAL NOTES

Outside of creating a AM14U3 drive base, this part has few uses. One possible use is using the large holes to hold flanged bearings (as they are meant to on the drive base).

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Churro Shaft

Churro Shafts are useful for low-stress hex shafts. If the shaft will be under significant stress, use VEX ThunderHex shafts instead. AndyMark has generic 3' silver churro shafts, but for $8.50 more, you can get it anodized in black, blue, gold, purple or red. The ¼" bore can be threaded with thread-forming screws. Use a 500EX Hex hub to connect sprockets or pulleys to the shaft for power transfer from a motor. Use FR8ZZ-HexHD bearings to connect to static support structures.

PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm used a churro shaft as an axle for its arm and as a shaft for its intake. The axle shaft was replaced with a ThunderHex shaft after it bent.

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber was braced with a churro shaft along with ThunderHex shafts.

ME

Category

AndyMark

Supplier*

am-3101-3

Part Number

FINAL NOTES

You can use churro shafts for low-stress axles, but high-stress axles should use ThunderHex shafts.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

L-Bracket for AM14U2&3

PRIOR USAGE

ME

Category

AndyMark

Supplier*

am-2954

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

L-Mount Bracket for AM14U Family

The L-Mount bracket is useful for mounting small items vertically on c-channel or a kit chassis. The holes are 1 inch apart horizontally and one inch apart vertically (top holes are ½ inch apart vertically). This makes mounting on c-channel very easy. The holes are sized for 10-32 bolts.

PRIOR USAGE

Gear Mechanism (Original) | Sparky | 2016

The Heart of the Beast had a L-Mount bracket holding the 256:1 P60 gearbox, RS-550 and SPARK motor controller for the first gear mechanism.

ME

Category

AndyMark

Supplier*

am-2794

Part Number

FINAL NOTES

Holes will need to be drilled out to accommodate ¼-20 bolts.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

REV 1" Extrusion

REV 1” Extrusion is from the REV Robotics Extrusion building system. There are slots along each side that fit #10 hardware. It is recommended to use the bolt head in the slot and the nut outside. Standard nylock nuts will not fit into the slot, only standard nuts and low-profile nylock nuts.

PRIOR USAGE

Not Used

ME

Category

REV ROBOTICS

Supplier*

REV-21-1000

Part Number

FINAL NOTES

When paired with the REV 1” Linear Motion Kit, these can be transformed into a telescoping arm or lift. Hardware and brackets from the 15mm Extrusion system will not work with this. There is a kit for a two-stage lift (REV-25-1238) and a third-stage extension (REV-25-1239) available to create a simple lift system.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

REV 15mm Extrusion

REV 15mm Extrusion is from the REV Robotics Extrusion building system. There are slots along each side that fit M3 hardware. It is recommended to use the bolt head in the slot and the nut outside. Nylock nuts will not fit into the slot.

PRIOR USAGE

Not Used

Category

Supplier*

am-2915

Part Number

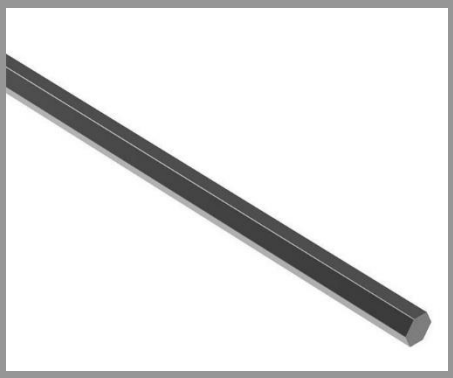
FINAL NOTES

When paired with the REV 15mm Linear Motion Kit, these can be transformed into a telescoping arm or lift. This was designed for FTC, so it should be used only in small applications. REV 1" Extrusion can be used for large lifts. Hardware and brackets from the 1" Extrusion system will not work with this.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Stock, 1/2 Hex

This is a 1/2" hex shaft. It is not a ThunderHex shaft because this does not have a hole down the middle and the corners are rounded on ThunderHex shafts.



PRIOR USAGE

Not Used

Category

Supplier*

217-2753

Part Number

FINAL NOTES

ThunderHex will be more useful than this in most applications because of the hole in them.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Stock, 1/2 Round Tube

This shaft stock has a 1/2" OD and a 1/4" ID.

PRIOR USAGE

Not Used

Category

Supplier*

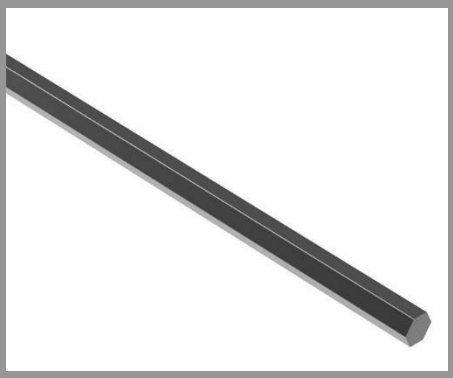
217-2762

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Stock, 3/8 Hex



PRIOR USAGE

ME

Category

VEX PRO

Supplier*

217-2754

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Stock, 3/8 Round Tube

PRIOR USAGE

ME

Category

VEX PRO

Supplier*

217-5519

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Shaft Stock, 8mm Keyed

PRIOR USAGE

ME

Category

G

Supplier*

30F795

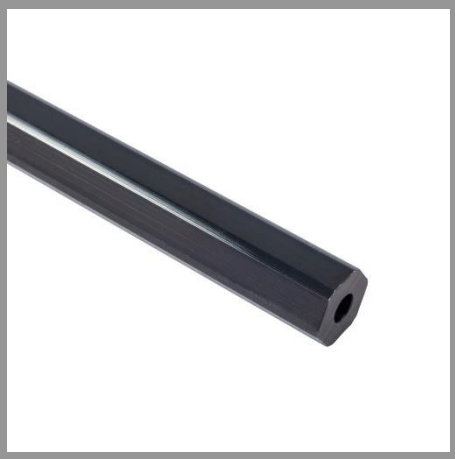
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

ThunderHex Shaft

These 1/2" hex shafts are very strong and will withstand large forces that would bend standard aluminum churro shafts. These are strong enough to be used for cantilevered drivetrain shafts in a West Coast style drivetrain. If the shaft will be under very little bending stress, a cheaper churro shaft can be used. The ¼" bore can be threaded with thread-forming screws.



PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm used a churro shaft as an axle for its arm and as a shaft for its intake. The axle shaft was replaced with a ThunderHex shaft after it bent.

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber was braced with a churro shaft along with ThunderHex shafts.

Category

Supplier*

217-2017

Part Number

FINAL NOTES

Use a 500EX Hex hub to connect sprockets or pulleys to the shaft for power transfer from a motor. Use FR8ZZ-HexHD bearings to connect to static support structures.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaBlock Kit and WCP Cam

VersaBlocks work with VersaFrame and a WCP Cam to allow adjustments to a drivetrain to make the chains or belts tight. The cam is placed as shown in the picture.

PRIOR USAGE

Not Used

Category	Supplier*
VersaBlock	217-3432
WCP Cam	217-3431
Part Number	

FINAL NOTES

VersaBlocks work with 1x2x.1" tube stock.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Angle Stock

VersaFrame is a versatile building system. These angles are 1x1" and 2x2". The holes are spaced 1" apart along the length of the stock. The rows on the 2" stock are 1/2" apart, with the second row offset by 1/2".

PRIOR USAGE

Not Used

Category	Supplier*
1x1x.09"	217-4109
2x2x.09"	217-4110

Part Number

FINAL NOTES

The holes can use 5/32" rivets or #8 bolts. They can be drilled out for larger hardware.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Bearing Mounts

VersaFrame is a versatile building system. There are three types of bearing mounts: face, end and side. They can hold 1.125" OD bearings.

PRIOR USAGE

Not Used

Category	Supplier*
Face	217-4183
End	217-3554
Side	217-3553
Part Number	

FINAL NOTES

The face bearing mount has two bearing holes and can be cut in half for use as two single bearing mounts.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame C-Channel Stock

VersaFrame is a versatile building system. This c-channel comes in 1x1x1x.09" and 1x2x1x.09". The holes are spaced 1" apart along the length of the stock. The rows on the 2" side of the stock are 1/2" apart, with the second row offset by 1/2".

PRIOR USAGE

Not Used

Category	Supplier*
1x1x1x.09"	217-4107
1x2x1x.09"	217-4108

Part Number

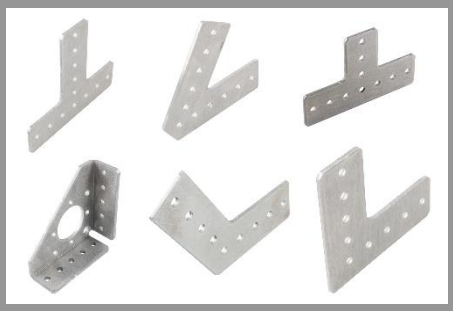
FINAL NOTES

The holes can use 5/32" rivets or #8 bolts. They can be drilled out for larger hardware.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Gusset

VersaFrame is a versatile building system. There are angle gussets in angles from 30 to 150°, t-gussets, + gussets, and corner gussets. Their holes are every 1/2". Corner gussets can also mount VersaPlanetary gearboxes.



PRIOR USAGE

Not Used

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

The difference between VersaChassis gussets and VersaFrame T gussets is that the chassis gussets have a shorter perpendicular section. The corner gusset is pictured bottom left.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Gusset Part Numbers

Angle Gussets

Angle (°)	Part Number
30	**217-3555**
45	**217-3552**
60	**217-3551**
90	**217-3548**
120	**217-4181**
135	**217-3556**
150	**217-4180**

Other Gussets

Name	Part Number
VersaChassis Gusset	**217-3557**
Corner Gusset	**217-4238**
T Gusset	**217-3547**
+ Gusset	**217-3550**

VersaFrame Plastic Tube Stock

VersaFrame is a versatile building system. This stock is made out of plastic, making it lighter but also weaker. It comes in 1x1x.1" and 1x2x.1". This tube stock has holes every one inch along two opposing sides, the 1" sides on the 1x2" stock.

PRIOR USAGE

Not Used

Category	Supplier*
1x1x.1"	217-5851
1x2x.1"	217-4819
Part Number	

FINAL NOTES

This should only be used for low-stress subsystems that will not experience large amounts of force.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Tube Stock, 1x1x.1”

VersaFrame is a versatile building system. This tube stock has holes every one inch along two opposing sides, and a pilot groove along the middle of the other two sides. The holes are designed for 5/32” rivets or #8 screws. They can be drilled out to fit larger hardware.

PRIOR USAGE

Not Used

ME

Category

VEX PRO

Supplier*

217-4104

Part Number

FINAL NOTES

This size of tubing is useful above the drivetrain for subsystems and support structures.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Tube Stock, 1x1x.04"

VersaFrame is a versatile building system. This tube stock has holes every one inch along each side, with perpendicular sides offset by 1/2". The holes are designed for 5/32" rivets or #8 screws. They can be drilled out to fit larger hardware.

PRIOR USAGE

Not Used

ME

Category

VEX PRO

Supplier*

217-3426

Part Number

FINAL NOTES

This stock has thinner walls than the standard .1" stock. Thus it is best used for low- to medium-stress applications above the drivetrain.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame Tube Stock, 1x2x.1"

VersaFrame is a versatile building system. This tube stock has holes every one inch along two opposing sides, and three pilot grooves 1/2" apart on the other two sides. The holes are designed for 5/32" rivets or #8 screws. They can be drilled out to fit larger hardware.

PRIOR USAGE

Not Used

ME

Category

VEX PRO

Supplier*

217-3453

Part Number

FINAL NOTES

This size of tubing is useful for the drivetrain chassis.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaFrame VP Mounts

VersaFrame is a versatile building system. These VersaPlanetary mounts can mount them in the face of a tube stock, parallel to the tube stock or on the side of the tube stock.

PRIOR USAGE

Not Used

Category	Supplier*
1" Parallel Mount	217-4178
2" Parallel Mount	217-4179
Side Mount	217-4239
Face Mount	217-3627
Part Number	

FINAL NOTES

There are two versions of the parallel mount so that you can connect to a 1" or a 2" side.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

M

Motors

775pro Motor

The 775pro motor is an air-cooled DC motor. It was designed as an improved version of the standard RS-775 motor. It is said to have the power of a CIM in a smaller package. A pinion needs to be pressed onto the shaft to transfer power to the gearbox it is connected to. It can be used with a BaneBots P60 or a VEX VersaPlanetary gearbox. The mounting holes are for M4 screws and the shaft is for 5mm ID pinions.

PRIOR USAGE

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber was run by a 775pro motor with a 256:1 P60 gearbox connected to the climber shaft with #35 chain. It was controlled by a Talon SR motor controller. The first motor seemed to be burnt out after the end of the 10,000 Lakes regional, but we suspect it was the PDP breaker because the inside of the motor did not show any signs of damage.

Shooter | Heart of the Beast | 2017

The Heart of the Beast's shooter was run by a 775pro motor connected to a 1:1 VEX VersaPlanetary gearbox with a Talon SRX Mag Encoder stage and an 8mm output shaft. It was controlled by a Talon SRX that was connected via its data port to the encoder.

Category

Supplier*

217-4347

Part Number

FINAL NOTES

If drilling near the motor is necessary, cover the open holes with tape or some other cover to protect the inside from swarf. Be careful to not break off the tabs when connecting or removing wires from the motor. Soldering wires onto the tabs is the best way to connect the power.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

AndyMark 775 RedLine Motor

The AndyMark 775 RedLine Motor is a new 775-class motor. It has about the same power as a VEX 775pro. As far as the specifications go, RedLine and 775pro motors seem to be interchangeable.

PRIOR USAGE

Not Used

Category

Supplier*

am-3775

Part Number

FINAL NOTES

There is an encoder kit designed for the RedLine, which could give it an advantage over the 775pro. Use a vent spacer if mounting to a custom gearbox.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

AndyMark 9015 Motor

The AndyMark 9015 motor is a RS-5xx series motor. The main difference between it and a BaneBots RS-550 is that the 9015's output shaft is knurled, rather than smooth. The mounting holes fit M3 screws. The 9015 is technically a CIM motor, because it is manufactured by CCL Industrial Motors, Ltd.

PRIOR USAGE

Not Used

Category

Supplier*

am-0912

Part Number

FINAL NOTES

The 9015 motor is useful in applications that use RS-550 motors, but because the shafts are knurled, we haven't used them.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

BAG Motor

BAG Motors are the modern replacement for the old Globe motors. The power wires are built-in. A 4mm ID pinion must be pressed onto the shaft to transfer power to the gearbox. BAG Motors are compatible with VersaPlanetary gearboxes.

PRIOR USAGE

Not Used

Category

Supplier*

217-3351

Part Number

FINAL NOTES

BAG Motors are useful for arms, intakes, etc.

We have gotten one BAG Motor in each KoP since 2013, so we do not need more until we use those.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIM Motor

CIM motors are the most powerful motors legal in FRC. They have been around since 2002. The shaft is 8mm in diameter with a 2mm keyway. When adding the gear to connect to a Toughbox Mini, use three washers, the gear (with the key), another washer and then the 8mm ring. This ensures it will not rub against the gearbox housing and that the key will not fall out.

PRIOR USAGE

Drive Train | Recyclops | 2015

Recyclops' drive train was run by four CIM motors, each connected to its own CIMple gearbox which was then connected to one of the Mecanum wheels.

Drive Train | Sparky | 2016

Sparky had four CIM motors, two per side, that were connected to Toughbox Mini gearboxes.

Drive Train | Heart of the Beast | 2017

The Heart of the Beast uses two CIM Motors each connected to a 5.95:1 Toughbox Mini gearbox for the gear mechanism side wheels.

Shooter (Prototype) | Heart of the Beast | 2017

The Heart of the Beast's first prototype of a shooter was run by a CIM motor connected to a 1:1 VersaPlanetary gearbox with an encoder. This motor was then replaced with a 775pro to give the shooter a higher RPM.

Category

Supplier*

Wiki

am-0255

Part Number

FINAL NOTES

CIM motors are very hard to burn out and are a good choice for a drive train. If space is a problem, use a MiniCIM (lower torque, same RPM). CIMs and MiniCIMs can be combined in a gearbox. CIM stands for CCL Industrial Motor; CCL stands for Chiaphua Components Limited. We get enough of these in the KoP each year that we usually do not buy any.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Dynamo Brushless Motor

The Dynamo Brushless Motor and Controller is the first brushless motor ever legalized in FRC. Brushless motors have much more torque for speed, are more efficient, last longer and use less power. The only drawback is that they are much more expensive, thus every one is an investment. The controller for the motor is integrated, thus the motor can be connected directly to the RoboRIO. The 2018 FRC software will give teams the ability to control the motor.

PRIOR USAGE

Not Used

Category

Supplier*

am-3740

Part Number

FINAL NOTES

The output shaft is 8mm and can be used with any CIM-compatible gearbox.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

MiniCIM Motor

The MiniCIM motor is exactly what its name implies, a mini CIM motor. With 2/3 the power and the same output RPM, the MiniCIM can replace a CIM in a lower-power subsystem (giving you more CIMs to use on the drivetrain).

PRIOR USAGE

Drivetrain | Heart of the Beast | 2017

Our original drivetrain consisted of four MiniCIMs, one for each gearbox. This was later changed to two MiniCIMs for each of the back wheels and a CIM for each of the front wheels.

Category

Supplier*

Wiki

217-3371

Part Number

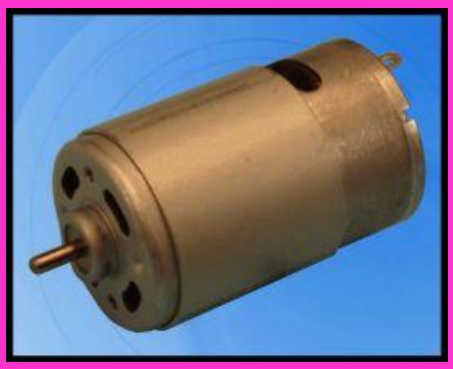
FINAL NOTES

Using MiniCIMs in a drivetrain is a bad idea because of their lower power output. Technically, you could replace every CIM with two MiniCIMs, but then you are using twice as many PDP ports for only a 33% increase in power. Using CIMs is an easier option. For other subsystems, the MiniCIM is a viable option.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

RS-550 Motor

BaneBots RS-550 motors are useful for subsystems that don't require much torque and need a lot of speed. The motor should be connected to either a P60 or a VersaPlanetary gearbox. The mounting screw holes accept M3 screws. If the motor spins the wrong way, switching the coded value is easier than resoldering the wires.



PRIOR USAGE

Intake | Sparky | 2016

Sparky had a RS-550 motor running a 4:1 P60 gearbox running its intake.

Gear Mechanism (Original) | Heart of the Beast | 2017

The Heart of the Beast had a RS-550 motor running a 256:1 P60 gearbox moving its original gear mechanism.

Category

Supplier*

Wiki

M5-RS550-12

Part Number

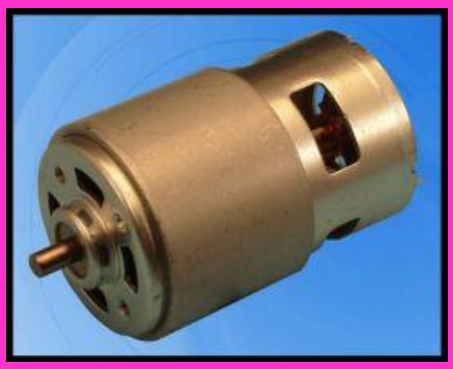
FINAL NOTES

RS-550 motors are small and fast with little torque. They can be attached to a 3:1, 4:1 or 5:1 first stage gearbox, allowing gear reductions up to 672:1.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

RS-775-18 Motor

The RS-775 motor is a small but powerful 18V motor (the 12V version was discontinued). It has about the same power as a 775pro or RedLine motor. The RS-775 can interface easily with a BaneBots P60, VEXpro VersaPlanetary or AndyMark 57 Sport gearbox.



PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm was moved by a RS-775 motor controlled by a SPARK motor controller.

Category

Supplier*

Wiki

M7-RS775-18

Part Number

FINAL NOTES

The RS-775 is a powerful motor that can be used in high speed and (with a gearbox) high torque subsystems.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Throttle Motor

Throttle motors are small and nearly useless in FRC. The power connection tabs are on the side with the output shaft, it has a weird star-shaped output shaft, and there are no COTS gearboxes that can use it. Most who want to utilize it must 3D print a gearbox. We have gotten Throttle Motors in each KoP since 2013 (2 in 2012, 4 in 2013-4, 2016-7, and 8 in 2015). We reduced our stock down to four at the end of the 2017 season.

PRIOR USAGE

Not Used

Category

Supplier*

N/A

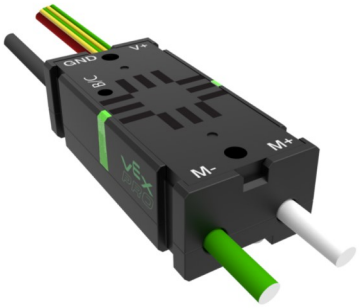
Part Number

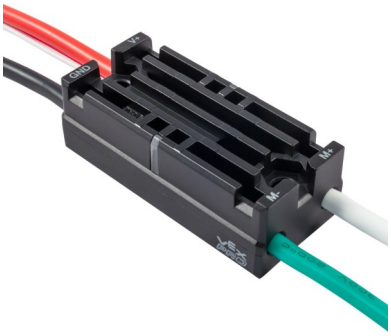
FINAL NOTES

Don't use the throttle motor unless if you are creating a custom gearbox for one. But even that's not worth the time. Use something else.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

MC





Motor Controllers

SPARK

SPARK motor controllers are similar to Talons and Talon SRs, but with the main difference that you are able to plug limit switches directly into the motor controller, requiring no extra code. The SPARK is useful for subsystems requiring limits.

PRIOR USAGE

Arm | Sparky | 2016

Sparky's arm was driven by a SPARK.

Gear Mechanism (Original) | Heart of the Beast | 2017

The original gear mechanism on The Heart of the Beast used a SPARK.

Category

Supplier*

Wiki

REV-11-1200

Part Number

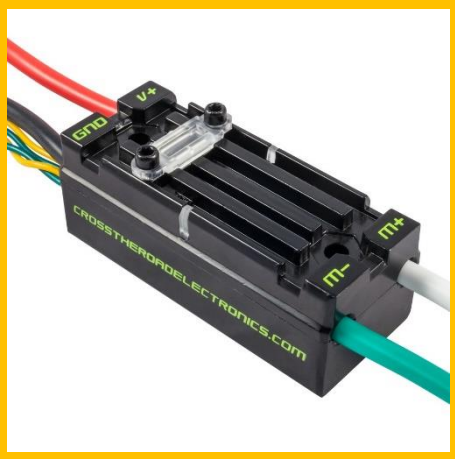
FINAL NOTES

SPARKs are very useful when controlling a subsystem that needs limitations on its travel. The forward limit (signaled as positive from RoboRIO) is closest to the power out terminals.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon SRX

The Talon SRX is a CAN Bus controlled motor controller. It was introduced into FRC in 2015. It has a power input side and a power output side. The power in is denoted by red and black wires while the power out is denoted by green and white wires. The wires are labeled on the case. There are two pairs of twisted green and yellow CAN wire on the power input side. The Talon SRX also has a data port to plug in sensors. The port has a plastic cover that keeps debris out and keeps the plug in.



PRIOR USAGE

Drive Train | Sparky | 2016

Sparky's drive train consists of four Talon SRX controllers.

Drive Train | Heart of the Beast | 2017

The Heart of the Beast has six Talon SRXs controlling its drive motors.

Shooter | Heart of the Beast | 2017

The Heart of the Beast has a Talon SRX controlling its shooter. The shooter has a SRX Magnetic Encoder that is directly connected to the Talon SRX data port.

Category

Supplier*

Wiki

217-8080

Part Number

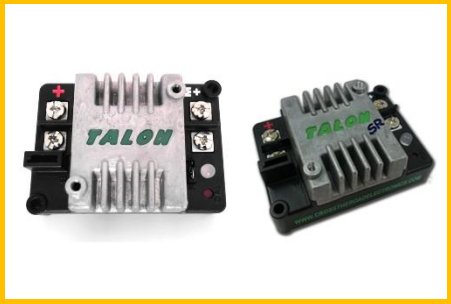
FINAL NOTES

The Talon SRX is loaded with features, but is quite expensive. The Talon SRX CAN code library is not in WPILIB in 2017, it must be downloaded from CTR-Electronics.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Talon/Talon SR

Talon SRs are useful where you just need a small-ish motor controller without the fancy features of a SPARK or Talon SRX. The Talon SR replaced the Talon after one year of production. There are few differences between the two models. Both are legal in FRC (as of 2017). They are both discontinued as the Talon SRX has taken their place in the Talon line. There is a jumper next to the indicator light to switch between coast and brake mode.



PRIOR USAGE

Arm - Intake | Sparky | 2016

Sparky's ball intake was controlled by a Talon SR (connected to a RS-550 with a 16:1 P60).

Agitator | Heart of the Beast | 2017

The Heart of the Beast's agitator was controlled by a Talon SR that was set to be on whenever the robot was enabled (connected to a RS-775 with PG71 gearbox).

Climber | Heart of the Beast | 2017

The Heart of the Beast's climber was controlled by a Talon SR (connected to a 775pro with a 256:1 P60).

Intake | Heart of the Beast | 2017

The Heart of the Beast's intake was controlled by a Talon SR (connected to a RS-775-18 with a 4:1 P60).

Shooter | Sparky – Demo | 2017

When prototypes of the shooter were added to Sparky, a Talon SR was used to control them because we didn't need to read the encoder speed, which would have required a Talon SRX.

MC

Category

Supplier*

Wiki

N/A

Part Number

FINAL NOTES

The Talon SR can have a 40mm fan mounted on the top, but this should not be necessary in most applications. There is a "B" on the case that lets you know which way the PWM cable is inserted (black wire near "B"). The light flashes different colors based on the signal it is getting. The output has a "M" next to it. As always, reverse polarity will destroy it.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Victor 884

The Victor 884 is the oldest legal motor controller in FRC. It uses PWM signals from the RoboRIO to control its output voltage to a motor. Introduced in 2003 to replace the Victor 883, it has been legal ever since but has not been provided in the KoP since 2012. In 2013, the Victor 888 took the 884's place in the KoP. The Victor SP was introduced in 2015 and also uses PWM.

PRIOR USAGE

Category

Supplier*

N/A

Wiki

Part Number

FINAL NOTES

Victor 884 controllers are large (relatively) and require a fan to cool the circuits. A better option would be to use a smaller Talon/Talon SR or Victor SP, all of which use PWM signals to control a motor.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Victor 888

The Victor 888 was introduced in 2013 to replace the Victor 884. It uses PWM signals to control the output voltage to a motor. It was then replaced by the Victor SP, but is still legal.

PRIOR USAGE

Category

Supplier*

Wiki

N/A

Part Number

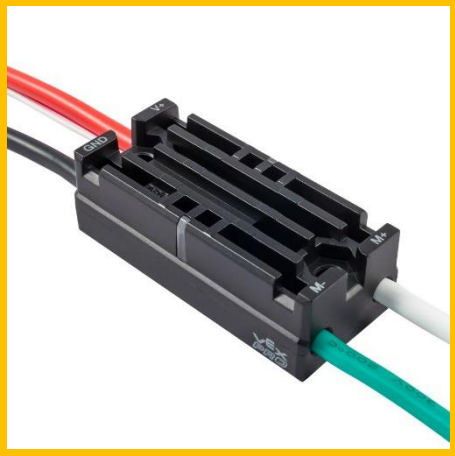
FINAL NOTES

The Victor 888 is large (relatively), and a smaller controller like a Talon/Talon SR or Victor SP should be used.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Victor SP

The Victor SP is a PWM-controlled motor controller that is similar in size to the Talon SRX. The power in is denoted by red and black wires while the power out is denoted by green and white wires. The wires are labeled on the case. There is a PWM wire on the power input side.



PRIOR USAGE

Not Used

MC

Category

Supplier*

217-9090

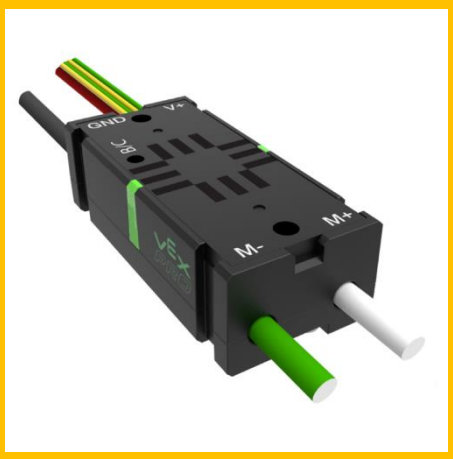
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Victor SPX

The Victor SPX is a CAN Bus or PWM controlled motor controller. It has a power input side and a power output side. The power in is denoted by red and black wires while the power out is denoted by green and white wires. The wires are labeled on the case. There are two pairs of twisted green and yellow CAN wire on the power input side with connectors attached.



PRIOR USAGE

Not Used

Category

Supplier*

217-9191

Part Number

FINAL NOTES

The Victor SPX is not for sale quite yet, but would be a good replacement for the Talon SR controllers we have used. These have many of the code features that Talon SRXs have (such as following) because they can be controlled by CAN.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PN

Pneumatic Parts

Flow Control Valve (Meter Out)

Meter-out valves slow the flow of air from the cylinder to the tubing (i.e. the air is pushed out of the cylinder). These help slow down pneumatic actuations which can help keep parts from breaking. This specific valve comes with thread lock on the threads. The specific valve commonly used is 1/8" NPT to ¼" tubing. If it is not required, use a regular 90° 1/8" NPT to ¼" tubing fitting.

PRIOR USAGE

Gear Mechanism (New) | Heart of the Beast | 2017

The Heart of the Beast uses a meter-out valve to slow the speed of the arm's actuation out.

PN

Category

Automation Direct

Supplier*

FVS14-18N

Part Number

FINAL NOTES

These can be helpful, but if not necessary use a regular 90° fitting instead.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

NPT Fitting, Adapter

This fitting will convert a 1/8" NPT female port to a 1/4" NPT female port. This is necessary for the emergency relief valve, which has a 1/4" male connection.

PRIOR USAGE

This part is used to connect the emergency relief valve to the 1/8" NPT ports used by the rest of the pneumatic components on the robot.

PN

Category

Automation Direct

Supplier*

BFMFR-14N-18N

Part Number

FINAL NOTES

Be sure to use Teflon tape on the male ends of the connections if it is not pre-installed.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

NPT Fitting, Female Tee

This fitting has three connections for 1/8 NPT male connectors (usually a straight fitting).

PRIOR USAGE

Commonly used near the compressor to connect different components to the compressor

PN

Category

Automation Direct

Supplier*

BFFT-18N

Part Number

FINAL NOTES

Be sure to remember Teflon tape if the male connector does not come with any or it has been worn down.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

NPT Fitting, Plug, 1/4"

These fittings will plug a 1/4" NPT hole that is not being used.

PRIOR USAGE

Not Used

Category

Supplier*

BFHHP-14N

Part Number

FINAL NOTES

Be sure to use Teflon tape with these, as it does not come pre-installed.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

NPT Fitting, Plug, 1/8"

These fittings will plug a 1/8" NPT hole that is not being used.

PRIOR USAGE

Usage Uncertain

Category

Supplier*

BFHHP-18N

Part Number

FINAL NOTES

Be sure to use Teflon tape with these, as it does not come pre-installed.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

NPT Fitting, Straight

This is used to connect two 1/8" NPT female ports together.

PRIOR USAGE

Used usually near the compressor where multiple NPT Female Tees are connected together.

Category

Supplier*

BFMC-18N

Part Number

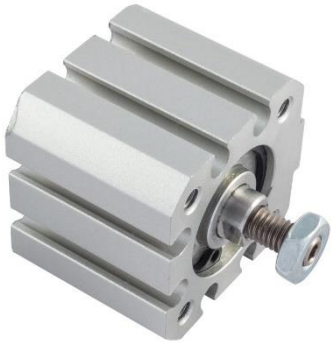
FINAL NOTES

Be sure to use Teflon tape with these, as it does not come pre-installed.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Pancake Pneumatic Cylinder

This pneumatic cylinder has a ½" stroke and is used with VEX 2-CIM and 3-CIM Ball Shifters.



PRIOR USAGE

Not Used

Category

Supplier*

217-2778

Part Number

FINAL NOTES

Connecting the cylinder shaft to the shifter shaft can be difficult. Unscrew the nut slightly until you are able to squeeze the coupler on.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Pneumatic Exhaust Silencer

Pneumatic Exhaust Silencers do exactly what their name implies, silencing the sound of air being released from a pneumatic system. If one of these is used with a manual release valve, I recommend having a second manual release valve nearby without one to allow all air to escape (open the one with the silencer first, unless if you are trying to scare someone).

PRIOR USAGE

Pneumatics | Sparky – Testing | 2017

When Sparky was being used to test new gear mechanisms, the exhaust assembly had a valve with a silencer and another valve nearby without.

Pneumatics | Heart of the Beast | 2017

The Heart of the Beast used the exhaust assembly that was used on Sparky.

Category

Supplier*

SBF-18N

Part Number

FINAL NOTES

Silencers are a good addition to a pneumatic system, as they lower the noise from the pneumatics when air is released. Remember to use Teflon tape.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Pneumatic Tubing

If you want to move pressurized air from one end of the robot to the other, or to a moving part, use pneumatic tubing. You technically could use rigid fittings for everything, but that is probably a waste of money and Teflon tape.

PRIOR USAGE

Pneumatics | Recyclops | 2015

Recyclops used pneumatics, and thus used pneumatic tubing.

Pneumatics | Sparky – Testing | 2017

Sparky was testing pneumatic mechanisms, and thus used pneumatic tubing.

Pneumatics | Heart of the Beast | 2017

The Heart of the Beast used pneumatics, and thus used pneumatic tubing

PN

Category

Automation Direct

Supplier*

PU14YEL100

Part Number

FINAL NOTES

This is ¼" OD tubing. I have listed yellow because it is one of our team colors and all the colors cost the same.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC Fitting, Union Cross

This PTC fitting can connect four tubes together in a cross formation.

PRIOR USAGE

Not Used

Category

Supplier*

UX14

Part Number

FINAL NOTES

These probably will only be useful if there is a tube that needs two branches split from it perpendicularly or needs to be split three ways.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC Fitting, Union Elbow

This fitting will connect two tubes at a 90° angle.

PRIOR USAGE

Not Used

Category

Supplier*

UL14

Part Number

FINAL NOTES

These likely will not be useful as one tube can travel the full length in most cases, not requiring a connection in the middle. These could be used in tight spaces where the tube's bend radius is too large for the curve.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC Fitting, Union Straight

This fitting connects two tubes collinearly.

PRIOR USAGE

Not Used

Category

Supplier*

US14

Part Number

FINAL NOTES

These fittings will likely only be useful if we are reusing old pieces of tubing that are not long enough to travel the full length between connections.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC Fitting, Union Tee

These fittings connect three tubes in a t-formation.

PRIOR USAGE

These were used whenever a tube needed to be split into two branches.

Category

Supplier*

UT14

Part Number

FINAL NOTES

These are useful for splitting a tube into two separate branches, but another option would be a Y fitting. Both are useful in different places, depending on what direction the branches need to travel in.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC Fitting, Union Y

This fitting splits a tube into two parallel branches.

PRIOR USAGE

Not Used

Category

Supplier*

UY14

Part Number

FINAL NOTES

These are useful for splitting a tube into two separate branches, but another option would be a Tee fitting. Both are useful in different places, depending on what direction the branches need to travel in.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC-NPT Fitting, Branch Tee

This fitting is similar to a PTC Tee fitting, but has a NPT fitting on the perpendicular connection.

PRIOR USAGE

Not Used

Category

Supplier*

MBT14-18N

Part Number

FINAL NOTES

These fittings could be useful near the compressor, where the tubes have to travel to multiple locations. These would save space by reducing the use of NPT Straight and Tee Fittings with PTC-NPT Straight Fittings to generate the same effect.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC-NPT Fitting, Elbow

These fittings have a NPT and a PTC fitting at a 90° angle.

PRIOR USAGE

Gear Mechanism (New) | Heart of the Beast | 2017

The Heart of the Beast's pneumatic cylinders used elbow fittings to minimize the space used by the tubing.

Category

Supplier*

ME14-18N

Part Number

FINAL NOTES

These fittings are useful if you don't need to control the air flow and using a straight fitting would cause the tubing to interfere with the operation of the robot.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC-NPT Fitting, Run Tee

This fitting is similar to a PTC Tee fitting, but has a NPT fitting on one of the collinear connections.

PRIOR USAGE

Not Used

Category

Supplier*

MRT14-18N

Part Number

FINAL NOTES

These fittings could be useful near the compressor, where the tubes have to travel to multiple locations. These would save space by reducing the use of NPT Straight and Tee Fittings with PTC-NPT Straight Fittings to generate the same effect.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC-NPT Fitting, Straight

These fittings are especially useful for connecting tubes to female NPT connection points (such as on a cylinder).

PRIOR USAGE

Used mainly in places such as connecting tubes to regulators and the compressor, etc.

Category

Supplier*

MS14-18N

Part Number

FINAL NOTES

If, because the tube travels straight out from the connection point, the tube interferes with the robot's performance, a PTC-NPT Elbow Fitting may be more appropriate.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

PTC-NPT Fitting, Y

This is similar to a straight fitting, but has two PTC outputs.

PRIOR USAGE

Not Used

Category

Supplier*

MY14-18N

Part Number

FINAL NOTES

These fittings could be useful near the compressor, where the tubes have to travel to multiple locations.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

SMC Connector and Cable

This cable is used with solenoid manifold solenoids. It is connected to a PCM. A double solenoid requires two cables.

PRIOR USAGE

Not Used

Category

Supplier*

217-2950

Part Number

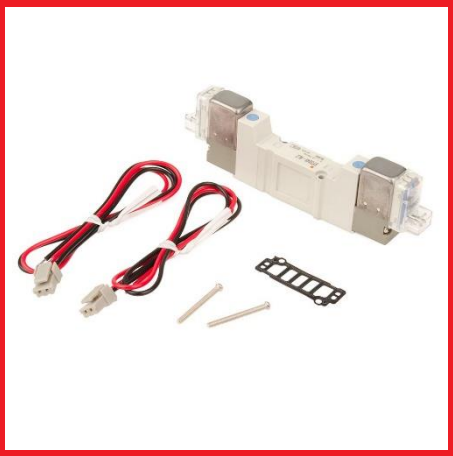
FINAL NOTES

Always check the cable connections on both ends before each match. The wires are small enough that the PCM cannot hold onto them under strong forces.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

SMC Manifold Double Solenoid Valve

These double solenoid valves are used with solenoid manifolds.



PRIOR USAGE

Not Used

Category

Supplier*

217-2948

Part Number

FINAL NOTES

Make sure the seal is not leaking, else the system may experience a lack of sufficient pressure.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

SMC Manifold Single Solenoid Valve

These single solenoid valves are used with solenoid manifolds.

PRIOR USAGE

Not Used

Category

Supplier*

217-3233

Part Number

FINAL NOTES

Make sure the seal is not leaking, else the system may experience a lack of sufficient pressure.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Solenoid Manifold Blank Station Kit

Solenoid Manifold Blank Station Kits are used to seal empty stations on solenoid manifolds.

PRIOR USAGE

Not Used

PN

Category

VEX PRO

Supplier*

217-2949

Part Number

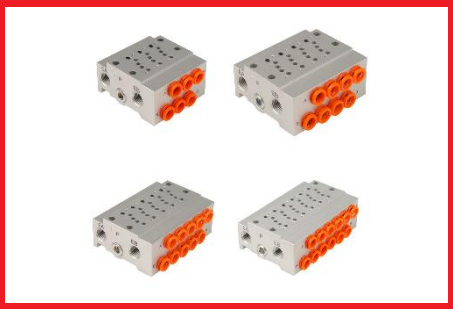
FINAL NOTES

Be sure the seal does not leak, otherwise the system will experience a lack of sufficient pressure.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Solenoid Manifold

Solenoid Manifolds are used to organize and consolidate the pneumatic solenoids in one place on the robot. VEXpro sells 3, 4, 5 and 6 station manifolds. They are used with single solenoids (217-3233) and double solenoids (217-2948). Blank Station Kits (217-2949) are used to seal extra stations that aren't connected to a solenoid.



PRIOR USAGE

Not Used

Category

Supplier*

217-2951 (3 Station) **217-2953 (5 Station)**
217-2952 (4 Station) **217-2954 (6 Station)**

Part Number

FINAL NOTES

A solenoid manifold could have been extremely helpful with the Heart of the Beast, as the solenoids were zip tied wherever there was room. If we use pneumatics in the future, I recommend these.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Solenoid, Double, Mead

This is a double solenoid (meaning that the two outputs are controlled separately). The ports require 1/8" PTC-NPT fittings to connect to pneumatic tubing. There is one input, the middle hole on the side with 3, and two outputs on the opposite side. The two remaining holes are exhausts. Be sure that all connections are properly sealed.

PRIOR USAGE

Gear Mechanism (New) | Heart of the Beast | 2017

The Heart of the Beast's pneumatic gear mechanism used two double solenoids to control the in and out of the arm and the in and out of the gear gripper.

PN

Category

AndyMark

Supplier*

am-3324

Part Number

FINAL NOTES

The main advantage of a double solenoid valve is that the cylinder it is controlling will hold its position after power is cut. One disadvantage is that it requires two PCM ports.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Solenoid, Single, Mead

This is a single solenoid (meaning that the two outputs are controlled by one signal). The ports require 1/8" PTC-NPT fittings to connect to pneumatic tubing. There is one input (labeled P), and two outputs (labeled A & B). The two remaining holes are exhausts. Be sure that all connections are properly sealed.

PRIOR USAGE

Not Used

Category

Supplier*

am-3323

Part Number

FINAL NOTES

The main advantage of a single solenoid valve is that the cylinder it is controlling will revert to its 'home' position after power is cut. It also only requires one PCM port.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VIAIR 90C Compressor

The 90C compressor is used to fill the robot's air tanks with pressurized air. It has a flow rate of 0.88 cubic feet per minute at 0 psi. It vibrates a lot and thus should be mounted away from any electronics.

PRIOR USAGE

Pneumatics System | Recyclops | 2015

Recyclops used a 90C compressor to power its pneumatics.

Pneumatics System | Heart of the Beast | 2017

The Heart of the Beast used a 90C compressor to power its pneumatics.

Category

Supplier*

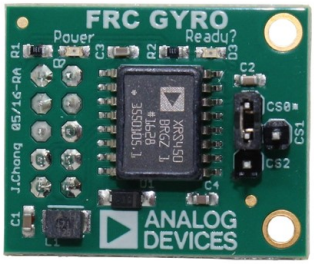
am-2005

Part Number

FINAL NOTES

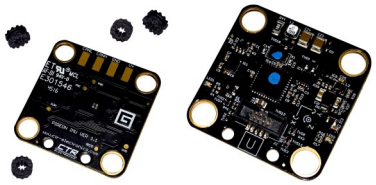
Be sure that you connect the wires correctly, reversing the polarity will damage it. It becomes hot when it is running so don't touch it after a match. Use the vibration isolators to reduce the effect of its vibration. The tubing connected to the compressor is under the highest pressure in the system and thus needs to be checked after each match.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.


FRC GYRO
Power
Ready?
ANALOG
DEVICES

S


PIXY
open source hardware



Sensors

ADXRS450 Gyro

The ADXRS450 gyro is able to be plugged directly into the SPI port of the RoboRIO. If it needs to be moved to another part of the robot, use a SPI cable. This gyro was included in the 2017 KoP. It is able to sense rotation around an axis normal to itself.

PRIOR USAGE

Electrical Board | Heart of the Beast | 2017

The Heart of the Beast had an ADXRS450 gyro added, but has not been used yet. It was added to the center of the robot and was connected to the RoboRIO with a 5' SPI cable.

Category

Supplier*

am-3555

Part Number

FINAL NOTES

The ADXRS450 gyro is easy to wire. SPI cables can be used to move the gyro away from the RoboRIO.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Axis M1011 Camera

Axis cameras are ethernet cameras. This means that they connect to the RoboRIO via a cat5e ethernet cord. This will require a network switch on the robot because unlike the cRIO, the RoboRIO has only one ethernet port. The power cord connects with a barrel connector that is smaller than barrel connectors used on other FRC devices (OM5P-AN/AC radio, Ethernet Microcontroller, etc.) The camera has a base that allows it to be aimed. One of our cameras is broken and cannot connect to a base.

PRIOR USAGE

Not Used

Category

Supplier*

N/A

Part Number

FINAL NOTES

KnightKrawler has recommended the use of Axis cameras instead of USB (LifeCam) cameras because the RoboRIO doesn't like to cooperate with USB cameras at times. Also, LED rings can be attached to the large rectangular Axis camera more easily than to the LifeCam camera.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Bumper Switch

Bumper switches function the same as limit switches: when they are depressed the signal is raised to high. The cable is pre-attached and has a male end, which is good for SPARKs, but will need to be connected to a female-female cable to connect to the RoboRIO. There is a slot on each side for mounting.

PRIOR USAGE

Arm | Sparky | 2016

A bumper switch was used to limit Sparky's arm's movement.

Category

Supplier*

276-2159

Part Number

FINAL NOTES

Bumper switches are good when the moving part that needs to be stopped will move until it nearly hits another part. They are more robust than limit switches.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CIMcoder

The CIMcoder is an encoder that can be mounted on the output end of a CIM. It shortens the amount of the shaft you can use, but has the same mounting holes.

PRIOR USAGE

Not Used

Category

Supplier*

am-3314a

Part Number

FINAL NOTES

If you want to measure the output RPM of a CIM without using a full VersaPlanetary with Encoder, CIM Adapter and CIM Output, then this is what you should use. This would have been used in 2017 for the shooter, but it was out of stock at the time.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

CMUcam5 (Pixy) Camera

The CMUcam5, or Pixy, is a very powerful vision tracking camera and processor. You are able to easily teach it seven unique items, plus more "color code" items (that part is complicated). There is a Mini USB type B port to connect to a computer, and a 10 pin port that connects via any of the available protocols (SPI, I2C and UART Serial), which are set via PixyMon, the Pixy's computer-based configuration program. There is a small cord that comes with the Pixy to connect it to an Arduino. PixyMon is available for Windows, MacOS and Linux.

PRIOR USAGE

Electronics Board | Sparky – Testing | 2017

Between our regionals we tried to get the Pixy to direct an autonomous routine, with little success. Many different connection protocols were tried.

Category

Supplier*

am-3477

Part Number

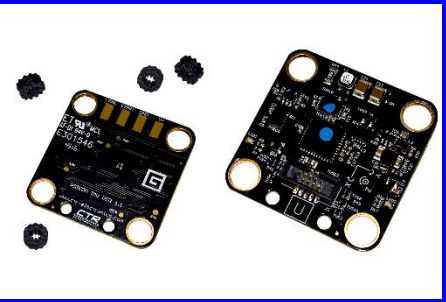
FINAL NOTES

Connecting to a Java-based RoboRIO is currently difficult, requiring custom code. More research needs to be done by our team to figure out how to use it well. Connecting to a C++-based RoboRIO is much easier.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Gadgeteer Pigeon IMU

This sensor has 9 degrees of freedom with a 3-axis magnetometer, accelerometer and gyroscope. It can connect to a Talon SRX via its data port.



PRIOR USAGE

Not Used

Category

Supplier*

217-5670

Part Number

FINAL NOTES

This sensor is highly praised by teams and would be especially useful in autonomous and with field-oriented robot control.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Grayhill 63R Encoder

This encoder is recommended by VEX for its 2 CIM Ball Shifter and Single Speed, Double Reduction gearboxes.

PRIOR USAGE

Not Used

Category

Supplier*

GH3070-ND

Part Number

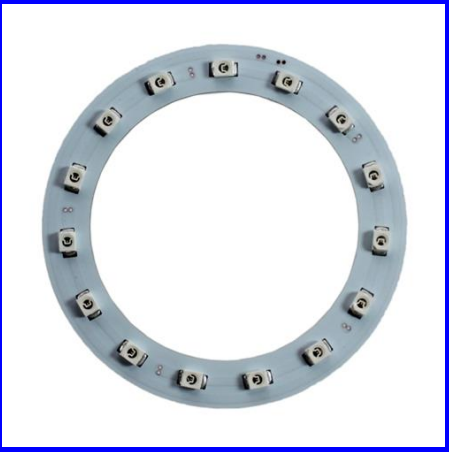
FINAL NOTES

This encoder produces a standard 2-bit quadrature code. Look at the documentation for pinouts. The pins can then be connected to a Talon SRX via a Talon SRX Universal Breakout Board for transmission to the RoboRIO.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

LED Ring, Green

This green LED ring is great for vision tracking as it fits around most camera lenses used in FRC. The green light reflected back by retroreflective tape can then be detected by the camera and processed by the RoboRIO or another microprocessor. The LEDs turn on when power is applied, and turn off when it is removed. They are 12V LEDs and can be powered by the 12V/500mA port on the VRM.



PRIOR USAGE

Electronics Board | Heart of the Beast | 2017

A LED ring similar to this one was added to each camera at the beginning of the season to be used for vision tracking. They were not used in competition and were subsequently removed.

Category

Supplier*

am-3597

Part Number

FINAL NOTES

These rings typically come with very small wires. These wires can be replaced with 22AWG CAN wire, which is easier to work with. Just pull off the old wires and solder the new wires to the pads.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

LED Ring, White

This white LED ring has 15 LEDs in a 60mm circle. The green LED ring is probably better for vision tracking.

PRIOR USAGE

Not Used

Category

Supplier*

am-3596

Part Number

FINAL NOTES

These rings typically come with very small wires. These wires can be replaced with 22AWG CAN wire, which is easier to work with. Just pull off the old wires and solder the new wires to the pads.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Limit Switch

VEX Limit Switches come with the switch and cable pre-installed. There is also a slot below the switch for mounting. The cable has a male end, which is good for SPARKs, but will need to be connected to a female-female cable to connect it to the RoboRIO.

PRIOR USAGE

Arm | Sparky | 2016

We attempted to use a VEX limit switch to stop the arm's movement.

Category

Supplier*

276-2174

Part Number

FINAL NOTES

VEX Limit Switches are better than the KoP switches because they come with the wires attached, making the wiring much easier.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Microsoft Lifecam HD-3000

The Microsoft Lifecam HD-3000 is a USB camera that is commonly used by FRC teams. Its long USB cord allows it to be placed almost anywhere on the robot and its magnetic Universal Attachment Base allows it to be zip tied to most places. If the blue light to the left of the HD is on, it is powered and is connected.

PRIOR USAGE

Arm | Sparky | 2016

A Microsoft Lifecam was placed behind the arm to give the driver a view of boulders in front of the robot.

Gear Mechanism (Original) | Heart of the Beast | 2017

The original gear mechanism had a Microsoft Lifecam positioned to its left to give the driver a view of gears in front of the robot.

Shooter | Heart of the Beast | 2017

The shooter had a Microsoft Lifecam positioned to its left to provide vision tracking for the shooter. It was not used and was subsequently removed.

Gear Mechanism (New) | Heart of the Beast | 2017

The new gear mechanism had a Microsoft Lifecam positioned behind and above it on a support shaft to give the driver a view of gears in front of the robot.

Category

Supplier*

am-3025

Part Number

FINAL NOTES

Team 2052, KnightKrawler, has recommended using ethernet cameras like the Axis M1011 Camera instead of the Microsoft Lifecam because the RoboRIO sometimes does not cooperate with USB cameras. This is apparent because before the beginning of every match, the camera must be unplugged and plugged back in once communication has been established.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Miniature Basic Switch

The Miniature Basic Switch, more commonly known as a limit switch, sends a signal when its button is depressed by its lever. These are listed under their formal name to differentiate them from VEX Limit Switches.

PRIOR USAGE

Tote Mechanism | Recyclops | 2015

The tote mechanism on Recyclops attempted to use limit switches to control its movement and prevent it from travelling too far.

Category

Supplier*

Kit of Parts

N/A

Part Number

FINAL NOTES

Use VEX Limit Switches before using these. VEX Limit Switches come with wires pre-installed, making them an ideal drop-in sensor. These, however, require three female connectors added to wires to connect them to the controller. And don't ask me which male connector is which, I don't know.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Photoelectric Sensor

PRIOR USAGE

Category

Supplier*

N/A

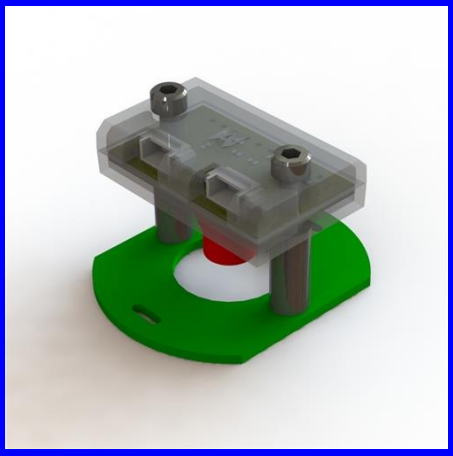
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

RedLine Encoder Kit

This kit connects a AM Mag Encoder to the back of an AndyMark 775 RedLine Motor.



PRIOR USAGE

Not Used

Category

Supplier*

am-3773

Part Number

FINAL NOTES

This product will not be available until late January.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

SRX Mag Encoder

The SRX Mag Encoder is a rotary sensor that senses the rotation of a diametrically polarized magnet nearby. The data port is compatible with Talon SRX Data Cables and can connect directly to a Talon SRX. The Talon SRX library directly supports the encoder. The magnet is 1/4" in diameter and 1/2" long.

PRIOR USAGE

Shooter | Heart of the Beast | 2017

The shooter on the Heart of the Beast used a VersaPlanetary Integrated Encoder, which uses a SRX Mag Encoder, to measure its rotational velocity.

Category

Supplier*

217-5049

Part Number

FINAL NOTES

The SRX Mag Encoder is used in VersaPlanetary Integrated Encoders and can be attached to a 2- or 3-CIM Ball Shifter with the Ball Shifter Mag Encoder Mount.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ultrasonic Rangefinder, HRLV

PRIOR USAGE

Not Used

Category

Supplier*

MB1013

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ultrasonic Rangefinder, LV

Obtained in the 2012 KoP.

PRIOR USAGE

Not Used

Category

Supplier*

MB1010

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Ultrasonic Sensor, VEX

PRIOR USAGE

Not Used

Category

Supplier*

276-2155

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VP Integrated Encoder

The VersaPlanetary Integrated encoder measures rotation inside a VersaPlanetary Gearbox. It uses a SRX Mag Encoder (included) and connects to a Talon SRX via a Talon SRX Data Cable.

PRIOR USAGE

Category

Supplier*

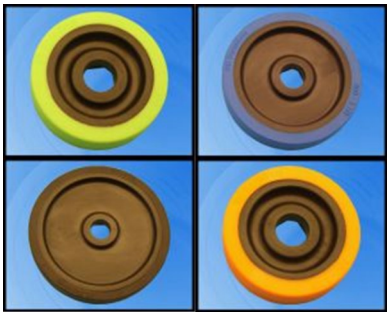
217-5046

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

W



x2

x2

Wheels

Wheel Parts

Colson Dead Hub

This hub is used with Colson wheels. The hub gets rotational power from the gearbox directly, instead of through the axle like it would with a live hub. These hubs accept two 7/8" OD bearings, one on each end. The bearings do not come with the hub, they must be purchased separately.

PRIOR USAGE

Not Used

Category

Supplier*

217-3429

Part Number

FINAL NOTES

These could be useful if we start using Colson wheels. We would then have to decide to run them live- or dead-axle (we have more experience with dead-axle at the time of writing).

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Colson Live Hub

This hub is used with Colson wheels. The hub gets rotational power from the axle, instead of from the gearbox like it would with a dead hub. The bore is 1/2" hex and will interface with churro and ThunderHex shafts.

PRIOR USAGE

Not Used

Category

Supplier*

217-3430

Part Number

FINAL NOTES

These could be useful if we start using Colson wheels. We would then have to decide to run them live- or dead-axle (we have more experience with dead-axle at the time of writing).

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Colson Performa Wheel

Colson Performa Wheels have been a part of FRC for a while. They have a good balance between traction and durability. They are commonly used on West Coast drivetrains. VEX has partnered with Colson to add ½" hex bore hubs to the wheels, making them even easier to integrate into a FRC robot. Another feature is that the wheel can be machined down into a special shape, such as for a shooter, and will not compromise the integrity of the wheel.

PRIOR USAGE

Not Used

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

Colson wheels are used by many teams, and have many uses. I highly recommend that we try these.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Colson Performa Wheels Part Numbers

½” Hex Bore

Diameter	Width	Part Number
1-5/8”	7/8”	**217-4045**
2-1/2”	1-1/4”	**217-4046**
3”	7/8”	**217-4047**
3-1/2”	1-1/4”	**217-4048**
3”	1-1/2”	**217-4050**
4”	7/8”	**217-4049**
4”	1-1/2”	**217-4052**
4”	2”	**217-4054**

1-3/16” Round Bore

Diameter	Width	Part Number
4”	1.5”	**217-4051**
4”	2”	**217-4053**

Compliant Wheel, 2"

Compliant wheels are designed for intakes. These wheels can come with holes for 3/8" or 1/2" hex shafts. The hole is only 0.3125" or 0.425", designed for an interference (tight) fit on the shaft. These are made from 35A (green), 45A (maroon) or 50A (blue) durometer silicone.

PRIOR USAGE

Not Used

Category

Supplier*

3/8 Hex: am-3571_xx

1/2 Hex: am-3462_xx

Part Number

xx:

35A – 35

45A – 45

50A – 50

FINAL NOTES

If we are using an intake to collect hard objects, softer wheels are better. Compliant wheels are even better, as they are able to conform to the shape of the object, getting more surface area to grip the object with.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Compliant Wheel, 4"

Compliant wheels are designed for intakes. There are three bore types: 8mm round, 3/8" and 1/2" hex. These are made from 35A (green), 45A (maroon), 50A (blue) or 60A (black) durometer silicone.

PRIOR USAGE

Not Used

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

If we are using an intake to collect hard objects, softer wheels are better. Compliant wheels are even better, as they are able to conform to the shape of the object, getting more surface area to grip the object with.

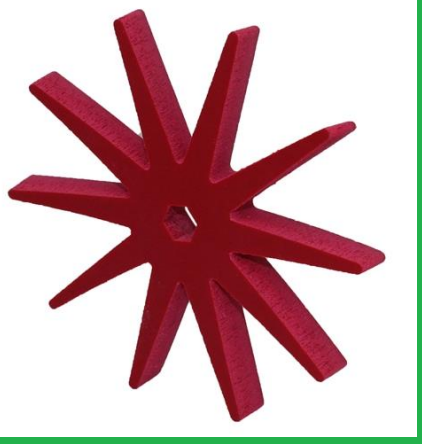
* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Compliant Wheel, 4" Part Numbers

Bore	Durometer	Part Number
8mm Round	35A	**am-3563_green**
8mm Round	45A	**am-3563_maroon**
8mm Round	50A	**am-3563_blue**
8mm Round	60A	**am-3563_black**
3/8" Hex	35A	**am-3562_green**
3/8" Hex	45A	**am-3562_maroon**
3/8" Hex	50A	**am-3562_blue**
3/8" Hex	60A	**am-3562_black**
1/2" Hex	35A	**am-3480_green**
1/2" Hex	45A	**am-3480_maroon**
1/2" Hex	50A	**am-3480_blue**
1/2" Hex	60A	**am-3480_black**

Entrapption Star

This is a 4.75", 10-spoke intake wheel. It is made of 45A durometer silicone, allowing it to slightly conform to the objects being collected. The bore is .425" hex, giving it an interference (tight) fit on a .5" hex shaft.



PRIOR USAGE

Not Used

Category

Supplier*

am-0619a

Part Number

FINAL NOTES

Depending on the objects collected in the game each year, these may be more or less useful. Multiple rows of these can increase the intake's effectiveness.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Mecanum Wheel, 4” HD

Mecanum wheels are useful to teams that wish to drive their robot in all directions without turning the robot (omnidirectional). It’s an easy way to simulate a swerve or crab drive without the technical expertise required for those drives. There are two versions of a Mecanum wheel, a right and a left. A drive needs two of each to work. They also need to be arranged in the correct configuration. Mecanum wheels are useless in pushing matches and are sometimes a negative factor elite teams take into account when choosing their partners.

PRIOR USAGE

Drive Train | Heart of the Beast | 2017

The Heart of the Beast had a set of 4" heavy duty Mecanum wheels as its drivetrain.

Category

Supplier*

Wiki

am-3067

Part Number

FINAL NOTES

Mecanum wheels can work as a drivetrain if you do not have the time and resources to create a swerve or crab drive. These specific wheels are good for intakes but can also be used for the drive train.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Mecanum Wheel, 6" HD

PRIOR USAGE

Category

Supplier*

Wiki

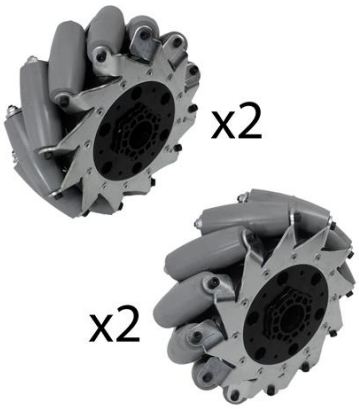
am-0732

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Mecanum Wheel, 8" HD



PRIOR USAGE

Category

Supplier*

Wiki

am-3340

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Mecanum Wheel, 10"

PRIOR USAGE

Category

Supplier*

Wiki

am-0447

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Omni Wheel, 4"

Omni Wheels are good for H-drives, Kiwi drives, and are commonly found on one or both ends of a 6- or 8-wheel West Coast Drive. Theoretically, these could be used for an intake, but it may take a while to figure out how.

PRIOR USAGE

Not Used

Category

Supplier*

am-3047

Part Number

FINAL NOTES

Use these if you are constructing a West Coast Drive, otherwise they are probably not worth the investment.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Omni Wheel, 6"

Omni Wheels are good for H-drives, Kiwi drives, and are commonly found on one or both ends of a 6- or 8-wheel West Coast Drive.

PRIOR USAGE

Not Used

Category

Supplier*

am-3154

Part Number

FINAL NOTES

Use these if you are constructing a West Coast Drive, otherwise they are probably not worth the investment.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Omni Wheel, 8"

Omni Wheels are good for H-drives, Kiwi drives, and are commonly found on one or both ends of a 6- or 8-wheel West Coast Drive.

PRIOR USAGE

Not Used

Category

Supplier*

am-0463

Part Number

FINAL NOTES

Use these if you are constructing a West Coast Drive, otherwise they are probably not worth the investment.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Stealth Wheel

Stealth wheels are small and designed primarily for FTC. They can be used as intake rollers. The durometers are as follows: green-35A, blue-50A, black-60A, grey-77A. There are 2" and 4" options with bores of 3/8" hex, ½" hex and 8mm round (no key).

PRIOR USAGE

Not Used

Category

Supplier*

See Next Page

Part Number

FINAL NOTES

Stealth wheels could be useful, but I have not found an application where the cheaper and more versatile BaneBots T81 wheels can be used instead.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

Stealth Wheel Part Numbers

2” Stealth Wheels

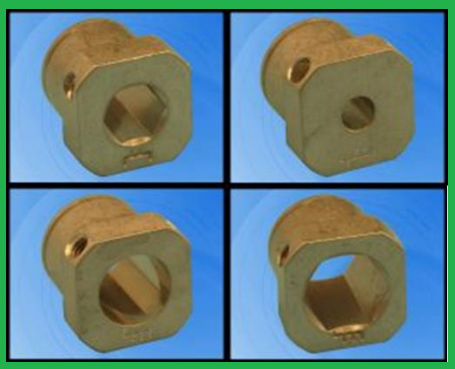
Durometer	Bore	Part Number
35A (green)	3/8” Hex	**am-3436_green**
50A (blue)	3/8” Hex	**am-3436_blue**
60A (black)	3/8” Hex	**am-3436_blk**
77A (grey)	3/8” Hex	**am-3436**
35A (green)	½” Hex	**am-3156_green**
50A (blue)	½” Hex	**am-3156_Blue**
60A (black)	½” Hex	**am-3156_Blk**
77A (grey)	½” Hex	**am-3156**
35A (green)	8mm Round	**am-3155_green**
50A (blue)	8mm Round	**am-3155_Blue**
60A (black)	8mm Round	**am-3155_Blk**
77A (grey)	8mm Round	**am-3155**

4” Stealth Wheels

Durometer	Bore	Part Number
35A (green)	3/8” Hex	**am-3435_green**
50A (blue)	3/8” Hex	**am-3435_blue**
60A (black)	3/8” Hex	**am-3435_blk**
77A (grey)	3/8” Hex	**am-3435**
35A (green)	½” Hex	**am-2648_green**
50A (blue)	½” Hex	**am-2638_Blue**
60A (black)	½” Hex	**am-2638_Blk**
77A (grey)	½” Hex	**am-2648**
35A (green)	8mm Round	**am-2647_green**
50A (blue)	8mm Round	**am-2647_Blue**
60A (black)	8mm Round	**am-2647_Blk**
77A (grey)	8mm Round	**am-2647**

T81 Hub

T81 hubs are used with T81 wheels to connect to almost any size of shaft. They have two set screws to secure the hub to the shaft. The hub has to be installed on the shaft before the wheel is installed on the hub. The c-ring is added after the wheel has been added to the hub and fits into a small notch on the hub.



PRIOR USAGE

Drive Train | Sparky | 2016

The Heart of the Beast has eight ½" hex T81 hubs on its intake.

Shooter | Heart of the Beast | 2017

The Heart of the Beast has three 8mm T81 hubs on its shooter.

Category

Supplier*

See Next Page

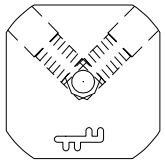
Part Number

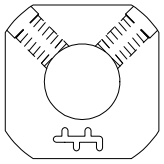
FINAL NOTES

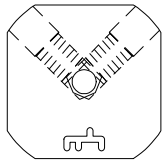
T81 hubs are versatile, with hubs in metric, inch and hex bores. The c-ring should be installed to keep the wheel on the hub (use a c-ring puller). If multiple wheels are supposed to be next to each other, the hubs should not be against each other, the wheels extend past the sides of the hub.

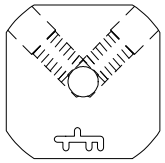
* This is who team 2855 usually purchases from. There may be other suppliers of this part.

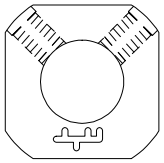
T81H
Quick Reference
DRAFT - 13 Sep 2016

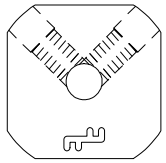

3mm
T81H-RM31

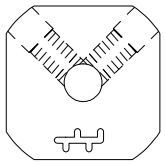

10mm
T81H-RMA1

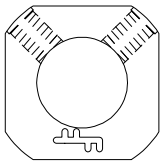

1/8
T81H-RS21

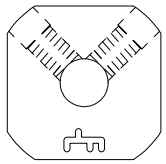

4mm
T81H-RM41

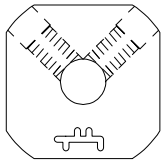

11mm
T81H-RMB1

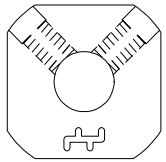

3/16
T81H-RS31

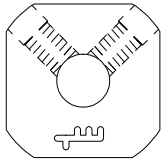

5mm
T81H-RM51

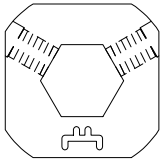

12mm
T81H-RMC1

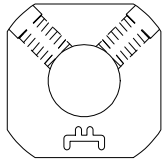

1/4
T81H-RS41

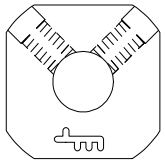

6mm
T81H-RM61

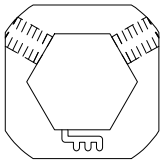

5/16
T81H-RS51

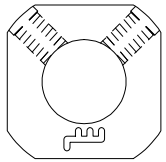

7mm
T81H-RM71

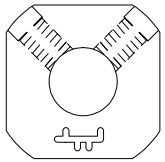

3/8 Hex
T81H-HS61

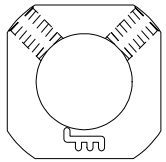

3/8
T81H-RS61

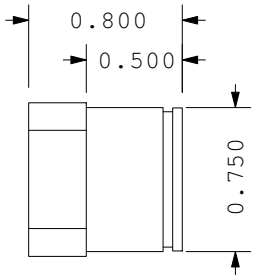

8mm
T81H-RM81

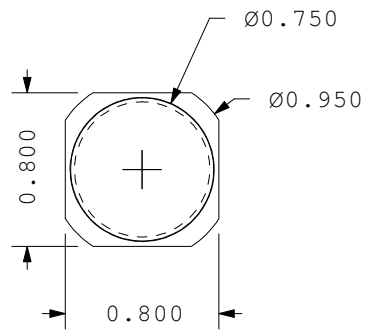

1/2 Hex
T81H-HS81


7/16
T81H-RS71


9mm
T81H-RM91

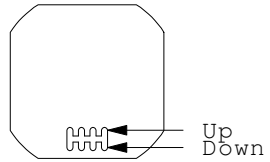

1/2
T81H-RS81



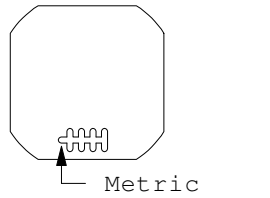


Marking

Inch
Up - On/1
Down - Off/0
Binary
1/16 in



Metric
Up - On
Down - Off
Binary
mm



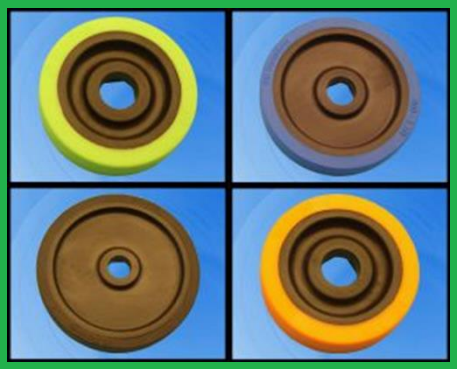
Stock Part Number:
T81H-busn

- Number of wheels
- Size (1/16in or mm)
- Unit (S=in, M=mm)
- Bore Shape (R=round, H=Hex)
- T81 HUB

Important Note:
Set Screw Holes are not fully threaded, they are oversized to the threads
Hubs are designed so that the bore can be increased by upto 1mm

T81 Wheel

T81 wheels are used primarily for intakes. They come in four durometers: 30A (Green), 40A (Orange), 50A (Blue) and 60A (Black). They come in three sizes, 2-7/8", 3-7/8" and 4-7/8". They are used with T81 hubs to connect to almost any size of shaft (inch, metric or hex). Each wheel is held onto the hub with c-rings.



PRIOR USAGE

Intake | Heart of the Beast | 2017

The Heart of the Beast has eight 2-7/8" 30A T81 wheels with ½" hex hubs on its intake.

Shooter | Heart of the Beast | 2017

The Heart of the Beast has two 2-7/8" 40A T81 wheels and one 2-7/8" 30A T81 wheel on its shooter with 8mm hubs in a 40A-30A-40A pattern.

Category

Supplier*

T81P-x9yBz

Part Number

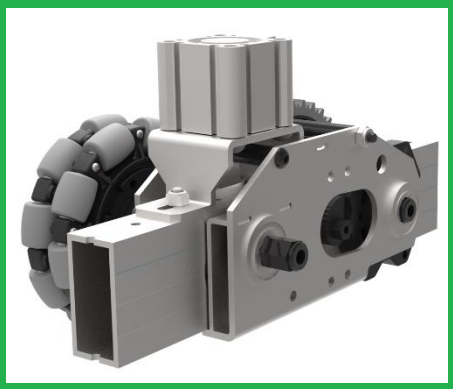
x:	y,z:
2-7/8 – 2	30A – 3,G
3-7/8 – 3	40A – 4,O
4-7/8 – 4	50A – 5,A
	60A – 5,B

FINAL NOTES

T81 wheels are versatile and can be used almost anywhere on the robot. The wide selection of hubs allow their use on designs using any size of shaft.

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaDrop



PRIOR USAGE

Category

Supplier*

217-4824
Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.

VersaWheel

PRIOR USAGE

Category

Supplier*

To Be Included in Future Version

Part Number

FINAL NOTES

* This is who team 2855 usually purchases from. There may be other suppliers of this part.