

Travis Installation Manual

Non-Welded Mechanically Attached Fittings

Installation Manual

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Safety



Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personnel injury or property damage during system operation. Travis cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and or system operation. Contact Travis when in doubt as to the safety precautions and operations. Only trained personnel with certified Travis installer training cards are permitted to operate the tooling.



To avoid personal injury keep hands/fingers away from crimping head and moving parts during operation. Keep face at a position away from the tool and in an area that allows for visual operation of the tool and crimping process.



Before operating tool perform a visual inspection of Travis swaging tool including the power unit and head assembly for any possible cracks, damage or tool wear.



Never operate the Travis tool without the head assembly properly engaged to the power unit as improper engagement can damage the tool.



Wear proper PPE when operating hydraulic and crimping equipment.



The system and pump pressure must not exceed the Travis Tooling maximum allowable operation pressure of 10,000 PSI/690 bar. Never set the relief valve pressure on any pump high then 10,000 PSI/690 bar. Higher settings may result in equipment damage and or personal injury.



Check and secure hose connections before operating the Travis swaging tool. Make sure hose is not kinked or bent. Assembly all equipment properly before operation. Check and secure hose connections before operation the Travis swaging tool.



Certain Travis tooling can be heavy. Take care when lifting and transporting the tools. Do not lift the Travis Tooling equipment by the hose or swivel couplers. Use the carrying handles or other means to handle the tooling in a safe manner.



Travis Tooling is to only be serviced by a qualified Travis technician. For repair and service contact the Authorized Travis Dealer for more information. **DO NOT ATTEMPT TO SERVICE THE TOOL.** Tooling is to be serviced every 10,000 cycles or 5 years (whichever comes first) and is the responsibility of the owner to contact the local Travis Dealer for Tooling Service Assistance.



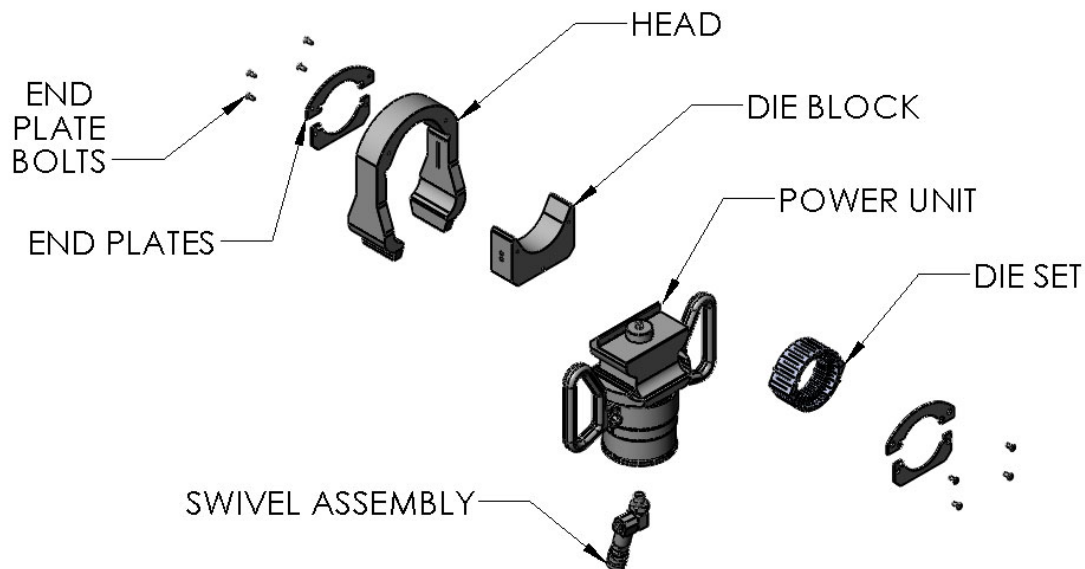
Immediately stop operation of the equipment if any parts show wear or damage. Contact your local Travis Dealer for part replacement and or tooling service.

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Travis Swaging Tool Parts and Equipment

WARNING

TOOL TO BE OPERATED BY QUALIFIED TRAINED PERSONNEL ONLY. REFER TO TRAVIS INSTALLATION MANUAL FOR PROPER OPERATING METHODS AND SAFE PRACTICES. DUE TO HIGH SWAGING FORCES, HEAD AND UPPER SECTION OF POWER UNIT MUST BE FULLY ENGAGED AND FLUSH ON BOTH SIDES. PARTIAL ENGAGEMENT MAY CAUSE TOOL FAILURE. SWIVEL AND QUICK CONNECT ASSEMBLY MUST BE INSTALLED PROPERLY BEFORE OPERATION OF PUMP. MAXIMUM ALLOWABLE OPERATING PRESSURE MUST NOT EXCEED 10,000 PSI / 690 BAR.



1. Travis swage tooling is meant to be used with all swage connectors fitting the parameters of Travis swage inspection gauges. The operation of the tooling by means of an external hydraulic supply to swage the Travis fittings into place on matching bus and cable connectors.
2. Select appropriate swage die set, apply swage lube to the bottom surface of the dies and landing areas of the Die Block and Head then insert (1) half of die set into die block and (1) half of die set into head. Attach endplates with bolts ensuring the tabs of the swage dies are located in the open slots of the endplates. Note that MSDS information for swage lube is available upon request and prolonged skin contact should be avoided although it is non-hazardous.
3. Check to ensure that the swage dies are located properly within the endplates and can move freely when pushed down.
4. Follow the above process when changing swage die sets for other sizes.
5. Used dies are to be inspected for debris and cleaned if required. Clean with pressurized air, soft brush or hand cloth removing all old swage lube and debris within the die slots and other surfaces.

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Travis Swaging Tool Pump Requirements

1. The hydraulic pumps used for operation of the Travis tooling must be capable of producing up to but not exceeding 10,000 PSI/690 bar and have internal relief valve to prevent pump from producing more than 10,000 PSI/690 bar within the Travis Tools.
2. Power operated pumps must operate in hold-to-run mode (hydraulic supply only as long as push-button or pedal is activated, hydraulic Stop or release when push-button or pedal are released).
3. The hydraulic hose and quick connectors joining the pump to the Travis Tooling must be rated for use with a 10,000 PSI/690 bar Pump.

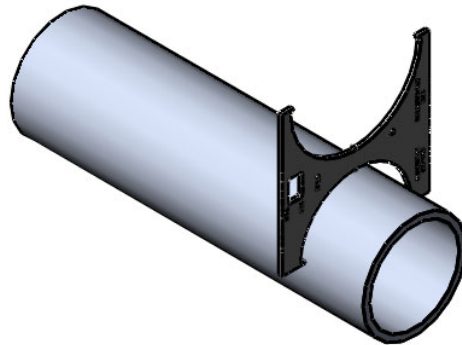
Pumps offered by Travis Pattern & Foundry for use with the Travis Tooling		
Part Number	Description	Weight lbs
PE172	110 Volt Electric Pump	45 lbs
Power Crimper	110 Volt Electric Pump w/ custom Travis Kit	50 lbs

Travis Kit (Part Number "Power Crimper") includes

- PE172 110 Volt Electric Pump.
- Automatic Pressure Switch.
- 10' Non-conductive hydraulic hose.
- 2.5" DIA Dial Pressure Gage.
- Fittings pre-installed to work with all Travis Swage Tools.

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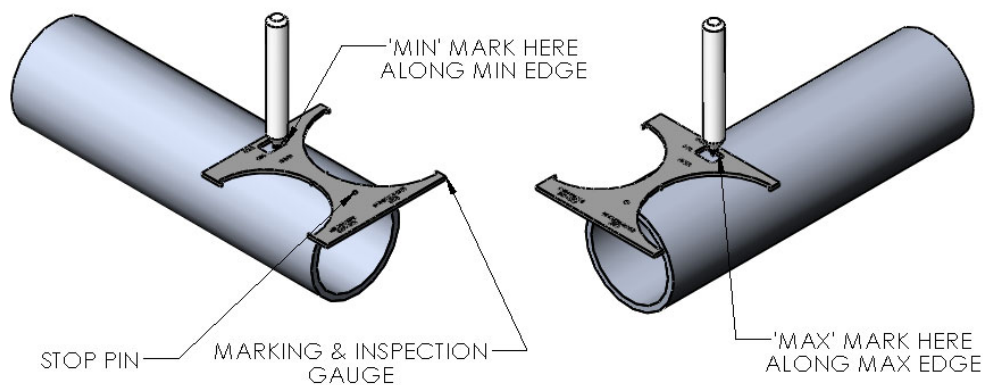
Verify Diameter of Pipe and Connector



- Minimum Pipe (NO-GO) gauge must not fit over any point 360 degrees around the pipe. The area of the pipe to be inspected is the location where the fitting is intended to be installed.

Note: If this criteria is not met, then a new location on the existing line that is acceptable must be used or the pipe cannot be used and new material is required. Pipe that does not meet the required dimension may not properly operate after crimping.

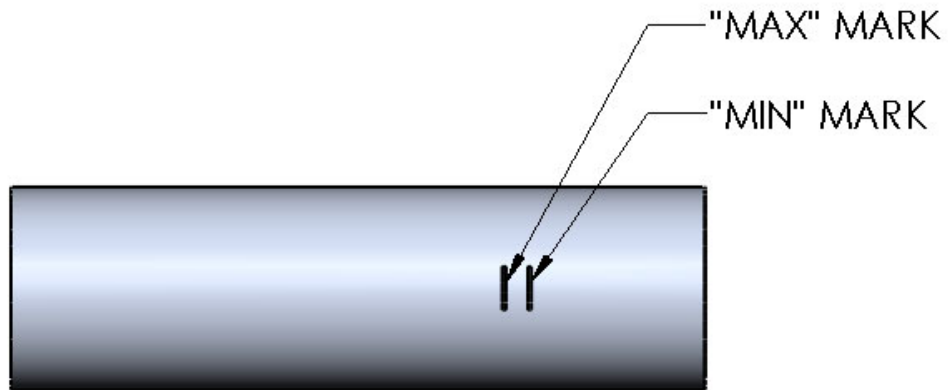
Pipe Marking



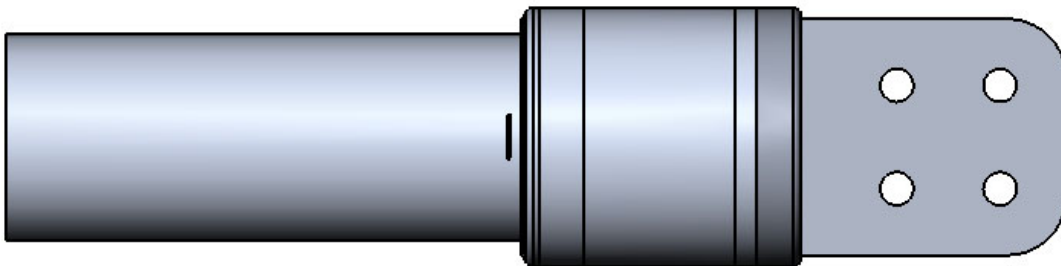
<ul style="list-style-type: none">• Position the inspection gauge on the pipe with the pin stop pressed up against the pipe end as shown.	<ul style="list-style-type: none">• Make the 'MIN' mark on the pipe along the min edge of the rectangle cutout.	<ul style="list-style-type: none">• Make the 'Max' mark on the pipe along the max edge of the rectangle cutout.
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Fitting Position and Alignment



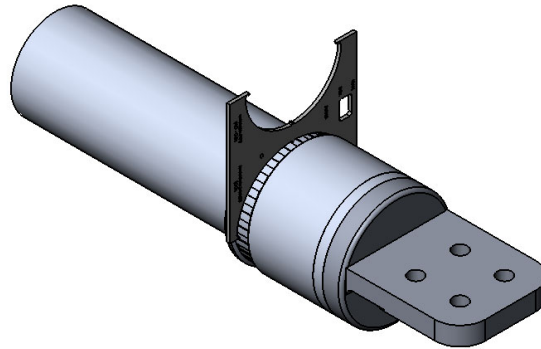
- "MIN" and "MAX" marks after using Travis inspection gauge.



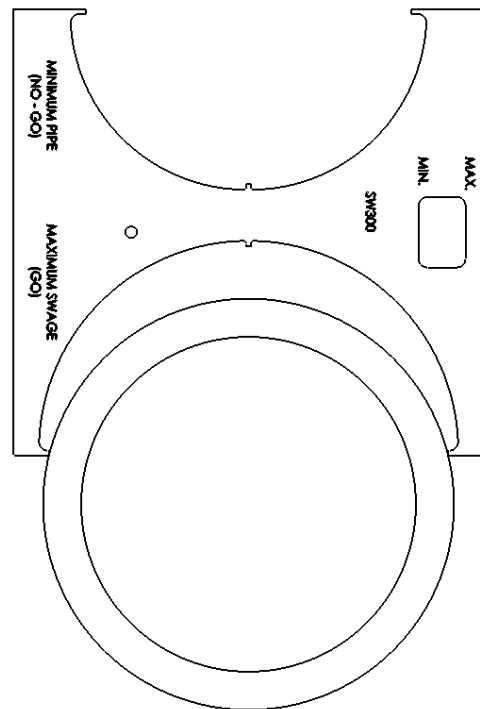
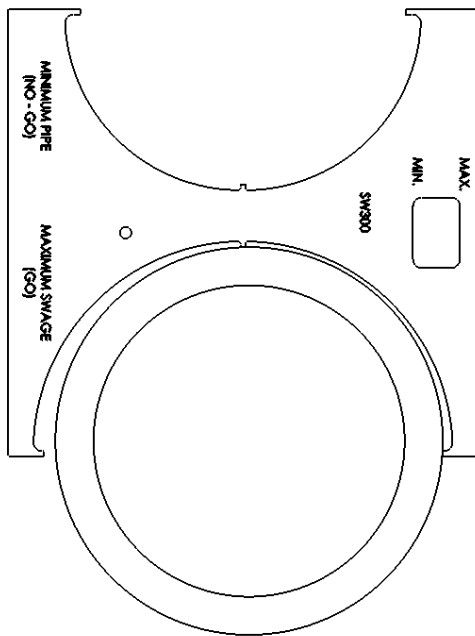
- Slide fitting over pipe until edge of sleeve is between the "MAX" and "MIN" marks.

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Swage Inspection & Assembly



- Each swaged area must be checked with the corresponding inspection gauge.
- The inspection gauge must fit freely around each swaged area at two locations 90 degrees apart from each other.

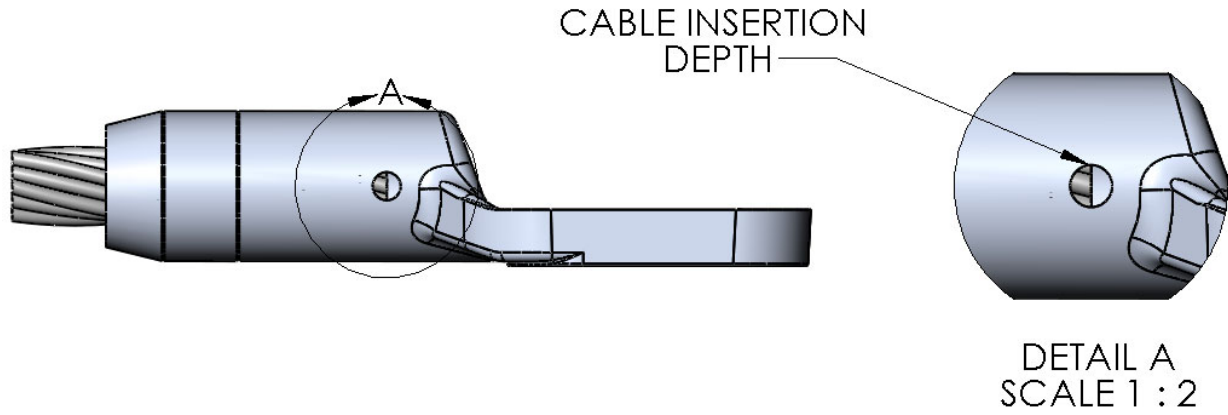


<ul style="list-style-type: none"> • 2 Point Contact, 90 degrees apart • Acceptable Swage 	<ul style="list-style-type: none"> • 2 Point Contact, 180 degrees apart • Indicates that diameter of fitting is oversized and need re-crimping
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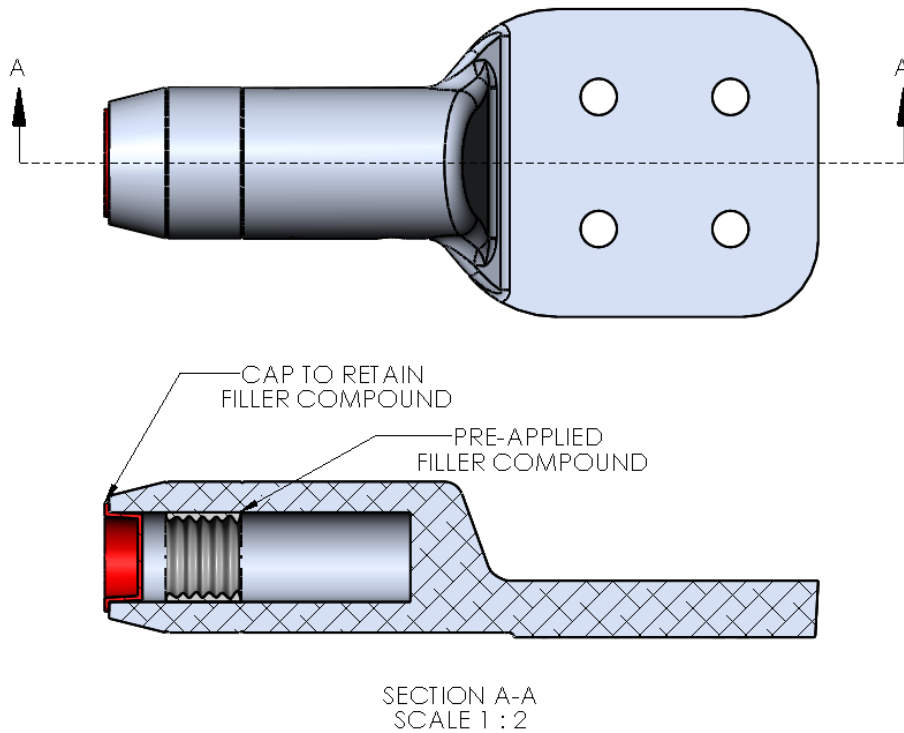
- If any swaged area does not pass the inspection gauge the fitting must be re-swaged.
- It may be required to re-swage, rotate the tool 90 degrees and re-swage in certain situations.
- After re-swaging, fitting must be checked with the inspection gauge as per the above process.

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Fitting Position, Alignment, and Filler Compound



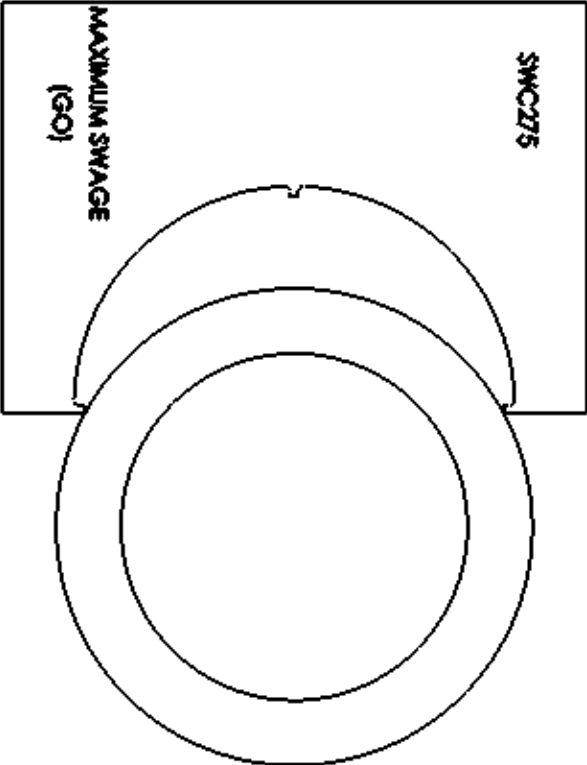
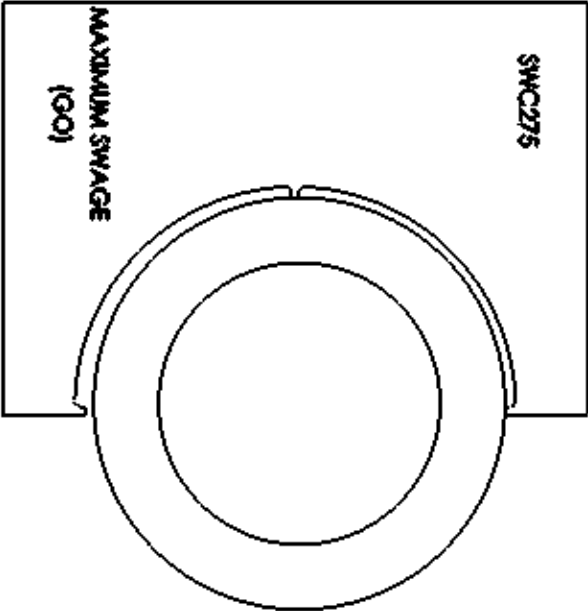
- Cable must be inserted until seen by inspection/weep hole.



- Travis swage connectors come from the factory pre-filled with filler compound (Figure 1.1). However, if filler compound is removed during handling before installation. New filler compound will have to be applied.

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Swage Inspection & Assembly



- 2 Point Contact, 90 degrees apart
- Acceptable Swage

- 2 Point Contact, 180 degrees apart
- Indicates that diameter of fitting is oversized and need re-crimping

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Trouble Shooting		
Problem	Possible Cause	Solution
Inspection gauge does not fit the pipe correctly.	Wrong size or out of tolerance pipe.	Check for the correct pipe size and also the correct inspection gauge.
Inspection gauge does not fit properly over the swage fitting.	Complete swage not performed. Improper pump pressure. Wrong die used, dirty, or worn.	Re-swage by rotating tool 90 degrees from original crimp position. Check the pump pressure. Inspect/clean dies/head.
Insertion and Inspection marks are not visible or not lined up with fitting.	Fitting improperly located on pipe before swaging.	Replace fitting.
Tool will not retract after swaging.	Hose not properly connected to the Quick Disconnect.	Remove hose and reconnect properly to the Quick Disconnect.
Hose cannot connect to Quick Disconnect of Power Unit	Pressure was not released fully after last use.	Push in the check valve plate in the hose and quick disconnect to release trapped pressure.

Tool Preventative Maintenance	
Procedure	Frequency
Check all components for deep scratches, gouges, cracks or other abnormal surface finish.	Before each use. Discontinue if noticed and contact supplier.
Check die inserts and head assemblies for foreign material or build up between die insert slots and head assembly.	Before each use. Clean with pressurized air, soft brush or hand cloth removing all old swage lube and debris within the die slots and other surfaces. Then apply new swage lube before use.
Inspect all Quick Disconnect and hose part to ensure no damage or loose threads.	Before each use. Tighten any loose threads and if any damage to part contact supplier.
Inspect/Re-calibrate Inspection Gauges.	After possible damage or based on owners gauges. Re-certification requirements. Dimensional drawings can be supplied for use by third part inspection and calibration.
Service Life Inspection/Re-certification	Every 10,000 cycles or 5 years (whichever comes first). Tool must be sent back to Travis for full life service maintenance and re-certification.

Travis Tool Matrix

Model 40 Power Unit - 40TSWPU				
Connector OD (SWC & SWCS Series)	IPS Connector (SW & SWS Series)	Travis Die Number	Travis Head	Travis Power Unit
1.00"		C100	40THD100	40TSWPU
1.25"		C125	40THD150	
1.50"		C150		
Model 55 Power Unit - 55TSWPU				
Connector OD (SWC & SWCS Series)	IPS Connector (SW & SWS Series)	Travis Die Number	Travis Head	Travis Power Unit
	1	B100	55THD150	55TSWPU
	1 1/2	B150		
1.75"		C175		
1.88"		C188		
2.00"		C200		
2.25"		C225		
Model 70 Power Unit - 70TSWPU				
Connector OD (SWC & SWCS Series)	IPS Connector (SW & SWS Series)	Travis Die Number	Travis Head	Travis Power Unit
2.75"		C275	70THD200	70TSWPU
	2	B200		
	2 1/2	B250	70THD300	
	3	B300		
	3 1/2	B350	70THD400	
	4	B400		