



a Hydratight® brand

Commercial & Military Aircraft Maintenance Tools



The Sweeney brand is a recognised leader in professional aerospace tooling, offering total design and production capabilities.

The Sweeney brand of aerospace tooling has been a part of Hydratight since 1999, but has led in the design, development and manufacture of specialised aircraft and engine maintenance tools and equipment for over 60 years.

All Sweeney products are manufactured in a modern 3,600 square meter machine shop in Antigo, Wisconsin, USA. Standard product lines range from torque multipliers and engine borescope turning tools to lifting fixtures and engine ground support equipment.

Hydratight works in partnership with the world's leading Original Equipment Manufacturers (OEMs). Using the latest computer technology and market leading development facilities, we continue to push back the boundaries of technology to provide fast, accurate and reliable solutions to critical assembly problems.

Our people are the key to our success—Hydratight's staff are qualified, competent, innovative and able to work closely with customers to ensure a total understanding of their requirements.

Hydratight's extensive bolting and machining services include:

- Torque and tension on-site bolting equipment
- On-site portable machining equipment
- Product sales, rental and technical support
- Product service and training
- Bespoke design and tool production

Hydratight is proud to be a supplier to the US Government.

DUNS: 557305146

CAGE Code: 87641

ISO 9001 (Quality Management), ISO 14001 (Environmental Management) and OHSAS 18001 (Occupational Health and Safety)



Engineering Driven Safety Focused Solutions



Commercial & Military Applications

Sweeney tools have been servicing aircraft and engines since 1901 on the models below and many legacy aircraft and engines.

Sweeney products are built to last. Our engineering and quality standards ensure our tools never fail when used as intended. Sweeney products are designed for use on the following engine models, however we can design and build customised tooling for any challenging application; see page 9 for further details.

Commercial

- High torque requirements and tooling used for assembly and teardown on the following turbofan engines:
 - CFM56
 - V2500
 - CF6
 - GE90
 - GENx
 - JT8D
 - JT9D
 - PW2000
 - PW4000
 - AE2100
 - RB211
 - TRENT

Military

- High-torque requirements for turbofan engines:
 - Pratt F100 on the F-15 and F-16
 - GE F110 on the F-16
 - GE F404 on the F-18
 - GE J85 on the F-5 and T-38
- Propeller removal assemblies on turboprop engines:
 - T56 on the C-130, E-2, & P3 Orion
- Rotor hoists and ground support equipment for:
 - T55 on the CH-47 Chinook
 - T64 on the CH-53 Super Stallion
 - T700 on the Apache, Black Hawk, Super Huey & Super Cobra



Torque Multipliers

Sweeney torque multipliers are the industry standard. These multipliers are used on aircraft both in the commercial world and military world.

Sweeney aerospace torque multipliers are high ratio, multiple reduction gear mechanisms providing a means for loosening and tightening threaded assemblies that demand very high torque values.

Each model is designed with an internal splined drive or square drive that connects to sleeve sockets which are specially designed for each application. Anchor pins are located on the back and/or front surfaces for versatility of anchoring.

At the heart of the Sweeney offering is the model 8200, the multiplier of choice for commercial and military applications up to 12,000 ft-lbs (16,262 Nm).

Specifications	UOM	8105 [▲]	8200 [▲] / 8200DS* / 8210**	8300C
Rated output capacity	in-lbs	36,000	144,000	360,000
	ft-lbs	3,000	12,000	30,000
	Nm	4,067	16,262	40,675
Anchor pin center-to-center	in	10.5		
	mm	266.7		
Anchor pins		1" (25 mm) diameter, 1" (25 mm) long		
Weight	lbs	31	54	195
	kg	14.06	24.49	88.5
Length	in	14.94	17.91	32.75
	mm	379	455	832
Width	in	12.75	12.5	20.5
	mm	324	318	521
Height	in	6	7.53	9.88
	mm	152	191	251
Torque ratio		8:1	11.1:1	42:1
Input drive		3/4" (19 mm) square female		
Output drive		Internal spline, 43 teeth 8/16 pitch		

[▲] NSN Part numbers Model 8105: 5120-00-406-3037, Model 8200: 5120-00-377-9652

* Model 8200DS (double spline) also available

** Digital read out

The model 8100 is no longer available. All 8100 torque multipliers should be replaced by the 8200.



Model 8105



Model 8200/8200 DS



Model 8210



Model 8300

Models 8112 and 8111 and Torque Multiplier Accessories

For moderate to heavy-duty torque solutions, Hydratight offers a wide selection of Sweeney accessories that increase ease of use as well as extend the range of applications.

Sweeney models 8112 and 8111 incorporate an automatic brake system that inhibits reverse torque from the multiplier's output being transferred to the multiplier's input drive. These models are also equipped with a primary input drive for high torque/low speed use, as well as a secondary input for low torque/high speed applications.

Specifications	UOM	8112 [▲]	8111E
Rated output capacity	in-lbs	600,000	1,000,000
	ft-lbs	50,000	83,333
	Nm	67,791	112,985
Anchor pin center-to-center	in	15.25	22
	mm	387.35	558.8
Anchor pins		1" (25 mm) diameter, 1" (25 mm) long	1.5" (38 mm) diameter, 1" (25 mm) long
Weight	lbs	270	395
	kg	122.5	179
Length	in	34.28	32.5
	mm	871	826
Width	in	24.19	27.69
	mm	614	703
Height	in	10.19	10.19
	mm	259	259
Torque ratio		65:1	125:1
Input drive		3/4" (19 mm) square female	
Output drive		Internal spline, 43 teeth 8/16 pitch	

▲ NSN Part numbers Model 8112: 5120-00-222-5001

Slings are available for the 8100 and 8200 series of multipliers. These slings attach directly to the multipliers and aid in the lifting and positioning of the tools during use. Also available are work handles with extendible arms which provide increased leverage and ratchet adapters which turn a standard breaker bar into a ratchet.

Part No.	Description	Specification information
81002	Sling	Used on models 8100 and 8200
81046	Adaptor	Adapts splined multipliers to 2-7/8" (73 mm) female hex
86511L	Socket	Allows customers to produce own sockets and power with Sweeney splined multipliers
67	Ratchet Adaptor	Input: 3/4" (19 mm) square female Output: 3/4" (19 mm) square male
63	Work Handle	Length: telescopes from 18"-30" (457.2 mm-762 mm) Output: 3/4" (19 mm) square male
53	Torque Wrench	Output: 1/2" (12.7 mm) square male Adjustable: 30-250 ft-lbs (40-339 Nm)

Note: For manual operation in applying torque, models 53, 63 and the 67 hand tools may be used with models 8200, 8111, 8112 and the 8300.



Model 8112



Model 8111



81002 Sling

Input Torque Multipliers

The Sweeney 8202 series provides additional multiplication to make those difficult torque procedures even easier. Input torque is reduced by an additional 6.5:1 ratio.

8202A Pneumatic Torque Multiplier

The model 8202A Air Torque Multiplier is designed to provide controlled air operation of model 8105, 8200, 8111, 8112 and 8300 torque multipliers.

Specifications	UOM	8202A
Maximum input air	psig	90
	bar	6.2
Output direct drive (1:1)	in-lbs	2,256
	ft-lbs	188
	Nm	255
Output reduced speed drive (6.5:1)	in-lbs	15,060
	ft-lbs	1,255
	Nm	1,661

Weight

8202-45 torque multiplier	lbs	11
	kg	5
8202-90 gearbox & airmotor	lbs	11
	kg	5
8106-90A air control kit	lbs	3
	kg	1.4
Model 8202A (total weight)	lbs	25
	kg	11.3
Anchor pins	1" (25 mm) diameter 1" (25 mm) long	

NSN part number for the 8202A: 5130-01-211-2188



Model 8202A with Model 8300

8202-290 Mechanical Torque Multiplier

The model 8202-290 provides controlled operation of model 8105, 8200, 8111, 8112 and 8300 torque multipliers. The manually operated unit eliminates the need of reacting the input torque and holds torque through an anti-backlash device.

Specifications	UOM	8202-290
Output direct drive (1:1)	in-lbs	2,256
	ft-lbs	188
	Nm	255
Output reduced speed drive (6.5:1)	in-lbs	15,060
	ft-lbs	1,255
	Nm	1,661

Weight

8202-45 torque multiplier	lbs	11
	kg	5
4600-285 Ratchet	lbs	4
	kg	1.81
Model 8202-290 (total weight)	lbs	17
	kg	7.7

NSN part number for the 8202-290: 5120-01-364-9523



Model 8202-290 with Model 8200

Digital Torque Multiplier

The Sweeney Digital Torque Multiplier Series was developed to perform high tolerance bolt up and break out operations within the Aero, Industrial and Oil and Gas industries.

For increased control and operation the torque multipliers within this series are equipped with a high resolution 177.8 mm (7") display. During use relevant measuring values appear on screen including torque, angle of turn as well as a graph depicting torque over time. Values appear in full colour, large format type enabling the operator to easily view and interpret data. The icon based menu driven system is controlled using an ultra-sensitive touch screen which responds to input even when gloves are worn.

When an operation is complete all data is stored on the device for future export using the available USB port or can be emailed out when connected to WiFi. Each user can create a separate login profile which will keep all recorded job data separate if needed.

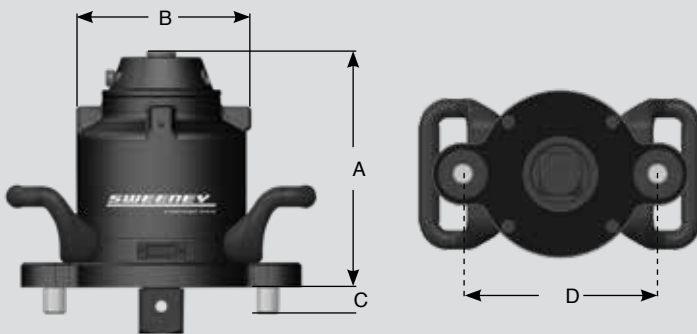
Features

- Output accuracies of +/- 0.4% full scale
- Ergonomic handles aid in positioning
- 177.8 mm (7") full color high resolution monitoring screen
- Battery powered monitoring screen with 8hr run time
- Accurate digital angle of turn readings
- Available measuring units include Nm, Ncm, lb ft, lb in, oz in, kNm, klb ft, kg m, kg cm
- Forward and rear facing cameras for capturing pictures and video

*A base model tablet without WiFi and camera features is also available



Check monitoring screen with relevant torque operation values



Specifications

	Max Output		Max Input		Torque Ratio	Input Sq. Size	Output Sq. Size	Overload Protection	Anti-Backlash
	ft-lbs	Nm	ft-lbs	Nm					
8510D	1000	1356	196	266	5.1:1	1/2	3/4	No	Yes
8550D	5000	6780	189	256	26.5:1	1/2	1-1/2	Yes	Yes

Dimension

	A - Height		B - Width		C - Reaction Stick Out		D - Reaction Points		Weight	
	in	mm	in	mm	in	mm	in	mm	lb	kg
8510D	5.1	129.5	4.4	112	0.53	13.5	3	76.2	14.5	6.6
8550D	7.6	192.9	5.6	142.3	0.86	21.9	7	177.8	32	14.5

Turbine Engine Digital Turning Tool

Providing a safe, controlled, cost effective way to rotate turbine engines during borescope inspection.

Features

- Borescope operator can control turbine rotation
- Automatic blade counting
- Flag blades for quick return to review
- Adjustable torque limit to 150 ft-lbs (203 Nm)—this is the most torque available from any turnover tool
- Most commercial and military engines loaded in engine library
- Motor is designed to fit all previous versions of Sweeney engine interface adapters
- Automatic/manual modes
- Variable speed and pause interval

Benefits

- Reduces inspection time
- Improves accuracy in positioning turbines for inspection
- New motor control technology will allow unprecedented accuracy (0.006 degrees) in positioning blades
- Quick set up—integrated carry case is designed to hold the unit with all the cables attached, so you can just pull out the motor/adaptor pendant and you are ready to go
- USB port on controller allows connectivity to laptops to download inspection reports for storage or print
- Pendant is light and easy to use; it is shaped to fit in one hand or hung close by to be read by the operator
- Torque overload sensor shuts down operation if excessive torque occurs, which can protect expensive components from damage
- Foot control for hands-free operation



DTT motor installed on a gear box

For more information, please visit hydratight.com

Specifications	UOM	SWE189DTT
Total system weight	lbs	35
	kg	15.9
System container dimensions	in	10 x 18 x 24
	mm	254 x 457 x 610
Power input	Vac	85–260
	Hz	47–440
	W Max	200
Speed		Continuously variable from 20 degrees/min to 360 degrees/min
Direction		Bi-directional with backlash compensation adjustable by user
Torque		User selectable 30–150 ft-lbs (40.67–203 Nm)
Acceleration/deceleration		0.2 s minimum, 5 s maximum incrementally adjustable

Hydratight provides Sweeney turning tool adapters for all models in the engine families listed below. If there is an adapter requirement for an engine model not listed, Sweeney engineers will work with you to design a customised solution.

CFM56

LEAP is in development

V2500

GE

- GE90
- GenX
- CF6
- LM2500
- LM5000
- LM6000
- F110

Pratt & Whitney

- JT8D
- JT9D
- PW2000
- PW4000
- F100

Rolls-Royce

- AE2100
- RB211
- Trent

Bespoke Turbine Engine Maintenance Tools

If you have access to an existing engineering drawing or have dimensions and specifications for a required tooling application, our team will work with you to design a bespoke solution.

Machining Capability Overview

NOTE: The following list of equipment is not the complete list in the Antigo, WI manufacturing facility. It is specific equipment used to make bespoke tooling.

Milling & Lathe Equipment

- CNC and manual milling max size 635.0 mm W x 1270.0 mm L x 457.2 mm H

CNC Mills

- Hurco vertical CNC Mill: 508.0 mm W x 762.0 mm L x 457.2 mm H—24 tool capacity—machine also has 4th axis rotary head with 203.2 mm chuck
- OKK vertical CNC Mill: 635.0 mm W x 1270.0 mm L x 457.2 mm H—30 tool capacity
- Mori-Seiki vertical CNC Mill: 508.0 mm W x 787.4 mm L x 355.6 mm H—60 tool capacity
- OKK horizontal CNC Mill: 711.2 mm W x 635.0 mm L x 558.8 mm H—41 tool capacity

Manual Mills

- Vertical: 368.3 mm W x 990.6 mm H

CNC Lathe

- Mori-Seiki Lathe—254.0 mm chuck; 508.0 mm swing; 2.87 spindle bore; 20.47 between centers with live tooling on the turret

Manual Lathes

- Up to 304.8 mm chucks; up to 457.2 mm dia. over the bed and up to 304.8 mm over the cross slide
- 76.2 mm spindle bore; 1524.0 mm length

Gear & Spline Cutting

- Fellows gear shapers up to 457.2 mm P.D. Outside/Inside Diameter with 88.9 mm stroke
- Fixturing for cutting external splines on long sockets up to 1117.6 mm long
- Barber Coleman shaper with 254.0 mm P.D. external/internal and 101.6 mm stroke capability
- Barber Coleman Hob—304.8 mm max dia. with 609.6 mm between centers

Additional Equipment

- Saw capability up to 330.2 mm dia. x 6400.8 mm bar length
- Paint booth size: 1828.8 mm x 1828.8 mm x 1828.8 mm
- Sand blast size: 1219.2 mm W x 762.0 mm L x 762.0 mm H
- Full assembly and load testing capability (up to 6,000 lbs.) for the size of product defined in criteria
- Full welding capabilities (steel and aluminum) with a 1524.0 mm x 1524.0 mm table. Weldments up to 1828.8 mm x 1828.8 mm x 1219.2 mm
- Welding limitations based on subsequent machining operations that may be required. This will be limited by size of largest milling machines as noted above.

***There are many variables and the listed criteria are meant to be general in nature and to provide enough information to determine product capabilities.



Military Ground Support Equipment & Bespoke Tooling

The machining technology in our Antigo, WI manufacturing facility allows Hydratight to provide Sweeney tooling solutions on multiple aircraft models used by the US Military.

Standard and digital torque multipliers are the core products, but capabilities extend to:

- Fixtures for removing and dismantling engines or transmissions
- Hoists for helicopter rotor blade removal in the field
- Lifts and handling kits for propeller removal and installation
- Shop stands for engine and transmission storage or transportation
- Bespoke sockets, adapters, base plates and retaining nuts

Sweeney tools are used to support the following:

- High-torque requirements for turbofan engines:
 - Pratt F100 on the F-15 and F-16
 - GE F110 on the F-16
 - GE F404
- Propeller removal assemblies on turboprop engines:
 - T56 on the C-130, E-2, & P-3 Orion
- Ground support equipment and torque tools for:
 - T55 on the CH-47 Chinook
 - T64 on the CH-53
 - T700 on the Apache & Black Hawk
- Bespoke “make-to-print” tool kits for maintenance on new or legacy engines

Sweeney-Hydratight Primary & Secondary NAICS Codes

332710: Machine Shop – Aircraft Maintenance Fixtures

332216: Manufacturing - Hand Tools, Non-Edged, Non-Powered

336413: Aircraft Ground Handling & Servicing Equipment

333991: Power Driven Hand-Tools

Primary FSC Codes

1730: Aircraft Ground Support Equipment

4920: Aircraft MRO Equipment

5120: Hand Tools, Non-Edged, Non-Powered

For a list of active NSN's, please contact your local representative at aero@hydratight.com

Sweeney-Hydratight Cage Code: 87641

DUNS: 557305146



SWE 13750 Tower Hoist



8271 Lift in use



Engine stand

Torque Testing and Calibration Services

Hydratight offers full service and calibration for many models of torque wrenches including all Hydratight and Sweeney branded torque wrenches and torque testers. We are also a manufacturer service centre for many other top brand names.

Most torque tools have an industry standard recommendation of a yearly calibration cycle. Hydratight recommends sending your tools in on an annual basis to be certified and serviced.

Our repair centre offers:

- Full service inspection, lubrication and certification
- NIST traceable as found and as left paper certificates provided with each service
- Quick turnaround time
- Expedited service available (48–72 hours) upon request
- Repair estimates provided before service

Repair Facilities

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hydratight®

Our global network means that you can rely on the right people, products, and services wherever you are in the world.

Email us at: solutions@hydratight.com

Or find your local representative at:

hydratight.com/contact

Hydratight provides support through service centres (●) and authorised representatives (◆)

