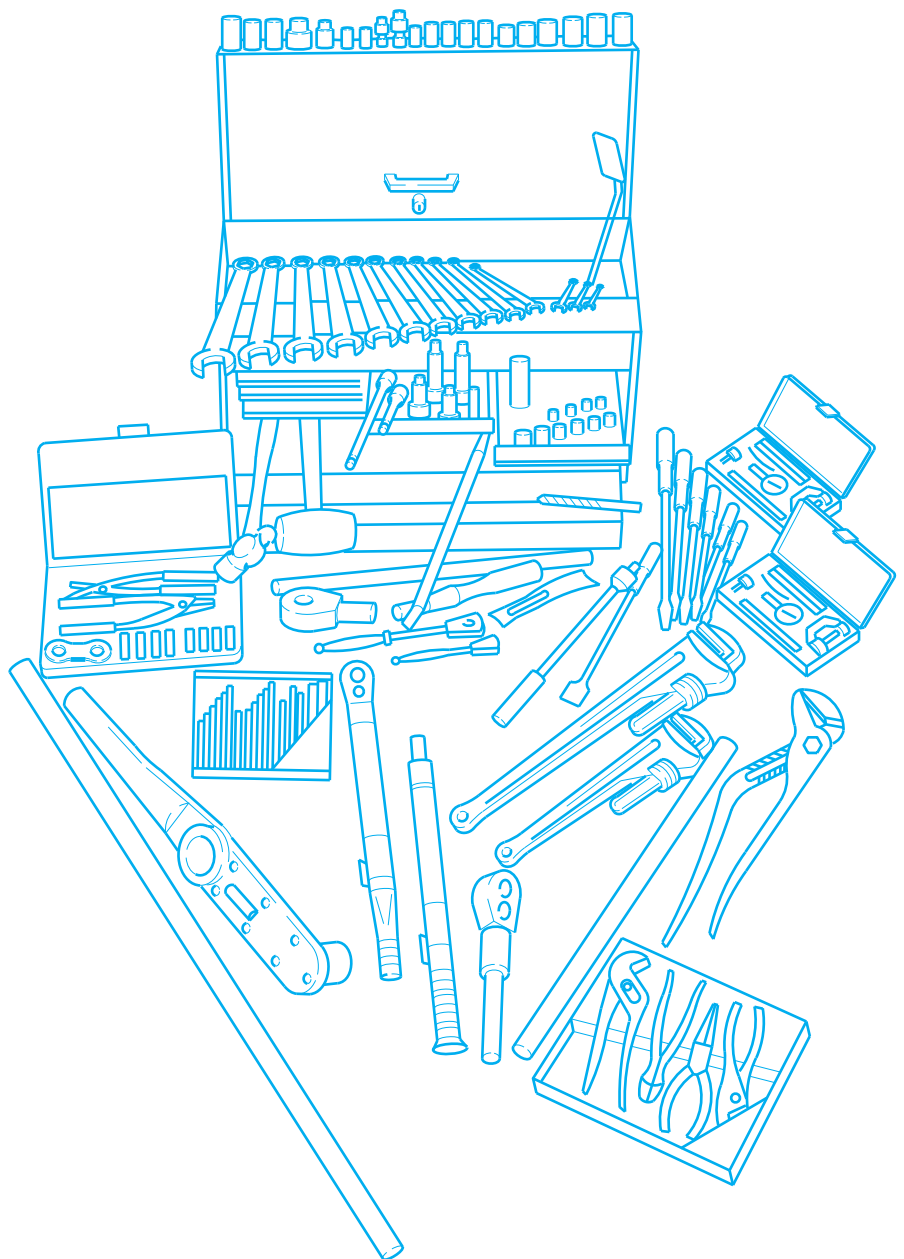


GE Power & Water
Distributed Power

Waukesha* gas engines

Special Tools Catalog

form 398-8
8th edition



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Waukesha gas engines

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Waukesha, Wisconsin 53188
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INTRODUCTION AND USE OF THIS CATALOG

Engine technology is changing at a very rapid pace driven by lean combustion and computer monitoring. The right tools are important because they allow the engine technician to perform his job in a professional and timely manner. These changes in technology and productivity requirements mandate the need for specialized tools.

Recognizing these needs, Waukesha has compiled and cataloged many specialized tools.

Waukesha Parts Operations markets the special purpose tools listed in this catalog. All inquiries regarding price and delivery should be directed to your authorized Waukesha Distributor or participating OEM.

Tools are grouped together according to engine type. In addition, there is a General Tools section. Tools listed in this section can be applied to multiple engine model series.

Special Tools Applications – The application tables list the Special Tools required for the proper service of Waukesha engines. General hand tools required for service are available in kit form and are listed at the beginning of tool section for each engine family.

General Tools – This section contains special tools that apply to more than one Waukesha engine model series. Tools are represented by an illustration and description on usage.

275GL / ATGL Tools – This section contains special tools that are specific to the 275GL / ATGL engine series. Tools are represented by an illustration and description on usage.

VHP Tools – This section contains special tools that are specific to the VHP engine series. Tools are represented by an illustration and description on usage.

APG 1000/16V150LTD Tools – This section contains special tools that are specific to the APG 1000/16V150LTD engine series. Tools are represented by an illustration and description on usage.

APG 2000/3000 Tools – This section contains special tools that are specific to the APG 2000/3000 engine series. Tools are represented by an illustration and description on usage.

VGF Tools – This section contains special tools that are specific to the VGF engine series. Tools are represented by an illustration and description on usage.

Intermediate Series Tools – This section contains special tools that are specific to the H2476G, F1905G, F817G, L3712G and F1197G engine models.

Appendix A – This section cross-references tool part number to page number.

Appendix B – This section cross-references tool description to page number.

NOTE: These lists are for reference only. For the most up-to-date lists see the “Engine Support Requirements” section on the GE Distributed Power web portal.

VHP TOOLS

SPECIAL TOOLS APPLICATIONS

G/GS/GSID	GL/GLD	SERIES FOUR	PART NUMBER	NAME
	X		474007	Prechamber Collet – L5108GL
	X		474036	Spark Plug Carrier Tool
	X	X	494217	Compression Tester/Adapter
X	X	X	494287	Valve Adjusting Wrench
	X		494290	Prechamber Removal Tool
X	X		474031	Valve Spring Compressor (Non CSA)
X	X		474033	Valve Spring Compressor (GL CSA)
		X	474034	Valve Spring Compressor (Series Four)
		X	474038	Valve Seat Extractor (Series Four)
		X	474040	Valve Bridge Guide Tool (Series Four)
X	X	X	474046	Valve Guide Reamer
X	X	X	495327	Valve Stem Seal Installer
X	X	X	495328	Intake Valve Seat Installer (TL82981)
		X	495329	Exhaust Valve Seat Driver (TL82982)
		X	495330	Bridge Guide Pin Driver (TL84308)
X	X	X	474044	Valve Guide Straightness Gauge
X	X	X	474000	Camshaft Dummy Gear
X	X	X	474005	Stop Sleeve
X	X	X	474013	Water Pump Kit
X	X	X	474025	Pick-up Location Guide/Cam Bearing Rollout Tool
X	X	X	474041	9-3/8 in. Piston Ring Expander (*)
X	X	X	474042	8-1/2 in. Piston Ring Expander (*)
X	X	X	494085	8-1/2 in. Bore Ring Compressor (*)
X	X	X	494206	9-3/8 in. Bore Ring Compressor (*)
X	X	X	494284	8-1/2 in. Sleeve Plate (*)
X	X	X	494286	9-3/8 in. Sleeve Plate (*)
X	X	X	494364	Main Bearing Roll-Out Tool (Inline Only) (*)
X	X		494365	Main Bearing Roll-Out Tool (Angle Drilled)
X	X	X	494366	Main Bearing Roll-Out Tool (T-Drilled)
X	X		499233	Cylinder Sleeve Removal Kit
X	X	X	495350	Spark Plug Sleeve Seat Resurfacer
X	X	X	474018	VHP Gas Piston Puller – 9-3/8 in. Bore (*)
X	X	X	474019	VHP Gas Piston Puller – 8-1/2 in. Bore (*)
X	X	X	474001	Camshaft Bearing, Roll-Out Tool
X	X		474003	Reducer
	X		474008	Spark Plug Carrier Remover Tool
	X		474023	CSA Spark Plug Carrier Tool
X	X		474012	Valve Guide Reamer T-Handle
	X		490049	Prechamber Removing Collet
X	X	X	495336	Valve Guide Removal and Installation Tool – Arbor
X	X		495497	Valve Guide Removal and Installation Tool – Guide
		X	495498	Valve Guide Removal and Installation Tool – Guide



G/GS/GSID	GL/GLD	SERIES FOUR	PART NUMBER	NAME
X	X		494305	Valve Seat Grinding Stone Current Wide Bridge Heads – 30° (*)
X	X	X	494280	Valve Seat Grinding Stone Seat Angle Stone – 30° (*)
X	X	X	494014	Valve Seat Grinding Stone Seat Angle Stone – 20° (*)
		X	494331	Valve Recession Gauge
X	X	X	476073	Cylinder Sleeve Top Puller Plate – 8-1/2 in. (*)
X	X		474022	Ignition Timing Disc Adjustment Tool
X	X	X	494344	Pilot Tool
X	X		494267	Extension Tool
X	X		494268	Socket – 1-5/16 in. (*)
X	X	X	494266	Socket – 1 in. (*)
X	X	X	494234	Cylinder Deglazing Hone Tool (*)
X	X	X	494236	Cylinder Deglazing Hone Tool (*)

* Depending on the engine model, only one of the listed tools is required.



APG 1000/16V150LTD TOOLS

SPECIAL TOOLS APPLICATIONS

PART NUMBER	NAME
472075	Piston Ring Expander
472076	Piston Ring Compressor
472077	Valve Stem Seal Installer
472080	Connecting Rod Guide Pin
472081	Connecting Rod Bearing Alignment Tool
472082	Turbocharger Water Connection Fitting Wrench
472083	Piston Extraction Tool
472086A	Spark Plug Sleeve Holder
472087	Main Bearing Roll-Out Tool
472088	Hydraulic Pump
472089	Valve Seat Extractor Tool
472090	Replacement Pins for the Valve Seat Extractor (472089)
472091	Cylinder Head Lifting Tool
472092	Valve Seat Insertion Installation Tool
472093	Valve Guide Installation Tool
472094	Cylinder Sleeve Puller
472095	Connecting Rod Bushing Removal Tool
472096	Four Valve Spring Compressor Tool
472117	Spark Plug Sleeve Tool
472102	Exhaust Gas Analyzer
472108	Sensor, O ₂ (for 472102)
472109	Sensor, NO, 0 – 3,000 ppm (for 472102)
472110	Sensor, NO ₂ , 0 – 500 ppm (for 472102)
472103	Crankshaft Seal Driver
475075	Spark Plug Extension Puller
472101	Hand Tool Kit
475072	Digital Manometer
475073	Infrared Thermometer
494338	Timing Light
494215	Compression Tester
494217	Compression Tester Adapter
475078	Hand-Held Oscilloscope
494272	Torque Wrench 3/4 in. (*)
494273	Torque Wrench 1/2 in. (*)
–	Torque Wrench 3/8 in. (*) (**)
495350	Spark Plug Sleeve Seat Resurfacers
495564	Depth Gauge Kit
475076	Borescope
472118	Recess Tube Tool
472002	Crankcase Spreader
472132	Cylinder Liner Pusher/Clamp
472133	Cylinder Liner Puller
Continued on next page.	



PART NUMBER	NAME
472056	Camshaft Bearing Removal and Installation Kit
472134	Valve Recession Tool
495759	Biogas Diagnostic Tool
740269	ECU Interface Cable
Other items that should be on-site:	
475029	O-Ring Lubricant
489341	High Temperature Fluorinated Grease

* Not required if purchasing Hand Tool Kit. Included in Kit 472101. These are special small-head wrenches to fit inside the inspection covers.

** Must be purchased as part of Kit 472101.



APG 2000/3000 TOOLS

SPECIAL TOOLS APPLICATIONS

PART NUMBER	NAME
472102	Exhaust Analyzer
473025	Hydraulic Jack
473027	Hydraulic Ram – 20 Ton
476000	Connecting Rod Bearing Installation Tool
476001	Upper Serration Cushion
476002	Connecting Rod Hydraulic Jacks
476003	Hydraulic Cylinder Head Jack Tool (Fixture/Stud Extensions/Hydraulic Jacks with Manifold)
476005	Ignition Timing Disk Adjustment Tool
476006	Anti-Polishing Ring Removal Tool
476007	Wrench for Preheating Resistor
476008	Prechamber Removal Tool
476009	TDC Checking Gauge
476010	Connecting Rod and Piston Assembly Lifting Tool
476011	Damper Lifting Device
476012	Stud for Damper Removal
476013	Cylinder Head Lifting Device
476014	Connecting Rod Installation Tool
476016	Piston Ring Expander Tool
476017	Oil Filter Before Turbocharger
476018	Pin for Flywheel and Damper Extractor
476021	Camshaft Mounting Device
476022	Idle Gear Inner Bushing Extractor Tool
476023	Camshaft Timing Device
476024	Idle Gear Outer Bushing Extractor Tool
476026	Valve Seat Installation Tool (without guide)
476027	Valve Seat Installation Tool (with guide)
476028	Valve Guide Installation Tool
476029	Valve Guide Removal Tool
476030	Valve Spring Compressor Tool
476031	Intake/Exhaust Valve Seat Puller
476034	Water Connection Installation Tool
476067	Piston Ring Compressor Tool
476068	Prechamber Check Valve Removal Tool for Valve 3341561 (*)
476069	Prechamber Check Valve Removal Tool for Valve 3342634 (*)
476070	Lower Serration Cushion
476071	M36 Stud Driver
476072	Spark Plug Removal Wrench
476073	Cylinder Sleeve Puller Top Plate
476074	Main Bearing Removal and Installation Tool
476076	Damper Fluid Testing Kit

* Indicates parts where only one option is to be purchased. Check the bill of material for correct application.



PART NUMBER	NAME
476077	Single Cylinder Head/Main Bearing Replacement Jack
476078	Camshaft Bushing Position Tool
476079	Camshaft Bushing Extractor Tool
476080	Thermocouple Removal Wrench
476084	Slide Hammer
494284	Cylinder Sleeve Puller Bottom Plate
494498	Piston Pin Snap Ring Pliers
499233	Cylinder Sleeve Removal Kit
	Ethernet Crossover Cable
A292539	Hydraulic Pump Kit
495229	Alignment Tool
495402	Compression Tester
495403	Compression Tester Adapter (rigid 14 mm)
495350	Spark Plug Sleeve Seat Resurfacers
495576	Cylinder Sleeve Installation Kit
Overhaul	
476035	Extension Tube, Camshaft Mounting Device
476036	Driver, Camshaft Mounting Device
476037	Guide, Camshaft Mounting Device
476038	Support, Camshaft Mounting Device
476039	Plate, Camshaft Mounting Device
476040	Nylon Plate, Camshaft Mounting Device
476041	Head Guide, Camshaft Mounting Device
476042	Center Guide, Camshaft Mounting Device
476043	Stopper, Camshaft Mounting Device
495557	Rod Journal Protector
Tools needed for properly lifting 12V/18V220GL (engine only)	
476081	Engine Lifting Spreader Bar
476083	Engine Lifting Bracket Kit
Service parts for selected tools	
472995	Seal Kit for 476003A Cylinder Head Main Bearing Jacks
476002A	Single Connecting Rod Replacement Jack (for 476002)
476003A	Single Replacement Jack (for 476003)
476004	Seal Kit for 476002 Connecting Rod Jacks
Hand tools for servicing APG 2000/3000	
476075	Hand Tool Kit
Additions	
475072	Digital Manometer
475073	Infrared Thermometer
494338	Timing Light
494215	Compression Tester
494217	Compression Tester Adapter
475078	Hand-Held Oscilloscope



APG 2000/3000 TOOLS

SPECIAL TOOLS APPLICATIONS

PART NUMBER	NAME
475019	Torque Wrench Kit 3/4 in. and 1 in.
494273	Torque Wrench 1/2 in.
	Torque Wrench 3/8 in.
<i>Other items that should be on-site:</i>	
475029	O-Ring Lubricant
489341	High Temperature Fluorinated Grease
495407	OraSeal Non-Hardening Sealant



GL/GLD – VEE	GSI/GSID – VEE	G – INLINE	GSI/GSID – INLINE	GL/GLD – INLINE	PART NUMBER	NAME
X	X	X	X	X	472065	Spark Plug Carrier Holder
X	X				472070	Veet Detonation Sensor Tool (Vee only)
			X	X	472073	Inline Detonation Sensor Tool
X	X	X	X	X	472074	Rocker Arm Cover Remover Tool (CSA only)
X	X	X	X	X	472004	Valve Seat Driver
X	X	X	X	X	472077	Valve Stem Seal Installer
X	X	X	X	X	472008	Valve Guide Extractor
X	X	X	X	X	472009	Valve Guide Driver
X	X	X	X	X	472010	Valve Seat Extractor
X	X	X	X	X	472096	Valve Spring Compressor
X	X	X	X	X	472015	Rocker Arm Stand/Manifold Nut Wrench
		X		X	472017	Lower Spark Plug Tube Socket
X	X	X	X	X	472035	Valve Guide Pilot
X	X	X	X	X	472044	Valve Seat Grinding Wheel
X		X	X	X	472068	Spark Plug Tube Removal Tool
X	X	X	X	X	472002	Crankcase Spreader
X	X	X	X	X	472007	Piston Puller
		X	X	X	472011	Camshaft Bushing Press
X	X	X	X	X	472012	Connecting Rod Bushing Press
		X	X	X	472023	Damper Flange Socket
		X	X	X	472024	Camshaft Pilot
X	X	X	X	X	472030	Guide Pin Kit
X	X	X	X	X	472048	VGF Crankshaft Seal Driver
X	X				472055	Camshaft Pilot Tool
X	X	X	X	X	472056	Camshaft Bearing Removal and Installation Kit
X	X	X	X	X	472057	Main Bearing Roll-Out Tool
X	X				472066	Damper Flange Socket
		X	X	X	472067	Water Pump Jam Nut Socket
X	X	X	X	X	472071	Water Pump Impeller Puller
X	X	X	X	X	472072	Cylinder Sleeve Puller
X	X	X	X	X	472075	Piston Ring Expander
X	X	X	X	X	472076	Piston Ring Compressor
X	X	X	X	X	495350	Spark Plug Sleeve Seat Resurfacet
X	X	X	X	X	472132	Cylinder Liner Pusher/Clamp
X	X	X	X	X	472133	Cylinder Liner Puller
X	X	X	X	X	472134	Valve Recession Tool
X	X	X	X	X	427078	VGF Hand Tool Kit
X	X	X	X	X	494245	Flexible Cylinder Hone



275GL / ATGL TOOLS

SPECIAL TOOLS APPLICATIONS

AT INLINE	AT25 VEE	AT27 VEE	275GL/ GL +	PART NUMBER	NAME
			X	472082	Turbocharger Water Connection Wrench
X	X	X	X	472996	Compression Tester Adapter
	X	X	X	473005	Gear Backlash Adjustment Tool
X	X	X	X	473016	Prechamber Remover Kit
	X	X	X	473030	Damper Plug Removal Tool (*)
	X	X	X	473035	Vibratech Damper Test Kit (*)
X	X	X	X	494215	Compression Tester
X	X			494538	Prechamber Remover Kit
X	X	X	X	A292539	Hydraulic Pump Kit
X	X	X	X	A292693	Damper Sample Container
X	X	X	X	292583	Valve Seat Installer
X	X	X	X	292630	Cylinder Head Lifting Eye
X	X	X	X	A292511	Water Guide Sleeve Remover
X	X	X	X	A292669	Valve Seat Remover
X	X	X	X	AA292579	Valve Spring Compressor
X	X	X	X	AA293268	Cylinder Head/Main Bearing Hydraulic Fixture
X	X	X	X	292779	Connecting Rod Nylon Guide Pin
X		X	X	296492	Anti-Polishing Ring Remover - Current Wide Groove
X	X			472990	Piston Ring Compressor (AT25GL)
X		X	X	473001	Piston Lifting Tool (AT27GL)
X		X	X	473002	Sleeve Puller Installer (AT27GL)
X	X	X	X	473010	Stud Installer
X	X	X	X	473017	Piston Ring Compressor (AT27GL)
X	X	X	X	473018	Piston Ring Expander (AT27GL)
X	X	X	X	473019	Anti-Polish Ring Removal Tool
X	X			473031	Piston Ring Expander Pliers (AT25GL)
X	X	X	X	473033	Camshaft Gear Adjusting Tool
X	X	X	X	473034	Camshaft Gear Pump Kit
X	X	X	X	494498	Piston Ring Retainer Plier
X	X	X	X	A292587	Main Bearing Turning Device
X	X	X	X	A292591	Thrust Bearing Turning Device
X	X	X	X	A292683	Crankshaft Deflection Gauge
X	X	X	X	A292696A	Connecting Rod Bearing Installation Tool
	X	X	X	A292704	Connecting Rod Hydraulic Jacks (set of 2)
	X	X	X	A292804	Camshaft Mounting Device
X				A295322	Camshaft Mounting Device
X	X	X	X	A292848	Pump Gear Disassembly Tool
X	X			AA292593	Sleeve Puller Installer (AT25GL)
X	X	X	X	AA292699	Connecting Rod Bushing Removing Tool
X	X	X	X	AA295135	Main Bearing Cap Lifting Tool

Continued on next page.



AT INLINE	AT25 VEE	AT27 VEE	275GL/ GL +	PART NUMBER	NAME
X	X			C292774	Piston Lifting Tool (AT25GL)
X	X	X	X	495350	Spark Plug Sleeve Seat Resurfacers
X	X	X	X	475076	Deluxe Engine Borescope Kit
X				A295140	Connecting Rod Hydraulic Jacks (set of 2)
X	X	X	X	A292514	Head/Main Bearing Hydraulic Jack
X	X	X	X	494447	Seat Grinding Stone
X	X	X	X	494448	Valve Guide Pilot
X	X	X	X	473046	Admission Valve Puller
X	X	X	X	494497	Tommy Bar Tool
X	X	X	X	472944	Main/Head Jack Repair Kit
X	X	X	X	472995	Hydraulic/Connecting Rod Repair Kit
X	X	X	X	473024	Expanding Rod for Collets
		X	X	473044	Hand Tool Kit (275GL/ATGL)
X	X	X	X	A292669	Valve Seat Removing Tool
X	X	X	X	A295137	Main Bearing Turning Device
X	X	X	X	A295138	Thrust Bearing Turning Device

Note: Hand Tool Kit 473004 is recommended as the best method to obtain the needed hand tools and torque wrenches.

* Depending on engine model, verify the application before ordering.

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GENERAL TOOLS

SPECIAL TOOLS APPLICATIONS

VHP	VGf	APG 1000	APG 2000/3000	AT/275GL	PART NUMBER	NAME
X	X				475033	Spark Plug Gapping Kit
X	X			X	494421	Spark Plug Gapping Tool
X	X				494422	Spark Plug Gapping Tool
X	X	X	X	X	475006	Spark Plug Spreading Tool
X	X				475008	Spark Plug Wrench
X	X	X	X	X	475035	Socket Extension
X	X	X		X	475037	Spark Plug Wrench
X	X	X		X	475065	Spark Plug Thread and Seat Cleaner (18 mm / 13/16 in. Reach)
X	X			X	494087	Spark Plug Thread and Seat Cleaner (18 mm / 1/2 in. Reach)
			X		494088	Spark Plug Thread and Seat Cleaner (14 mm)
X	X	X	X	X	495350	Spark Plug Sleeve Seat Resurfer
X	X	X	X	X	475075	Spark Plug Extension Puller
X	X			X	475077	Ignition Analyzer
X	X	X	X	X	475031	Torquing Device
X					474016	V-Belt Tension Tester
X	X	X	X	X	475073A	Infrared Thermometer
X	X	X	X	X	475074	Infrared Thermometer
X	X	X	X	X	475007	Oxygen Analyzer – 110V
X	X			X	475032	CEC Ignition Tester
X	X	X	X	X	494357	Oxygen Analyzer – 110V
X	X	X	X	X	475068	Oxygen Analyzer – 220V
X	X	X	X	X	475069	Oxygen Analyzer – 220V
X	X	X	X	X	494346	Exhaust Probe – 5-1/2 in.
X	X	X	X	X	494345	Exhaust Probe – 9 in.
X	X	X	X	X	494360	Exhaust Analyzer Accessory Kit
X	X	X	X	X	475015	Filters
X	X	X	X	X	475076	Deluxe Engine Borescope Kit
X	X	X	X	X	475023	Light Source
X	X	X	X	X	475022	DC Battery Pack
X					475026	Regulator Adjuster
X	X	X	X	X	475072	Smart Manometer
X	X	X	X	X	475038	Pi Tape
X		X	X	X	475039	Oxygen Sensor Socket
X	X	X	X	X	475064	Digital Thermometer
X	X	X		X	494215	Compression Tester
X	X				494217	Compression Tester Adapter (18 mm)
X	X	X	X	X	494227	Timing Light – 110V
X	X				494338	Timing Light

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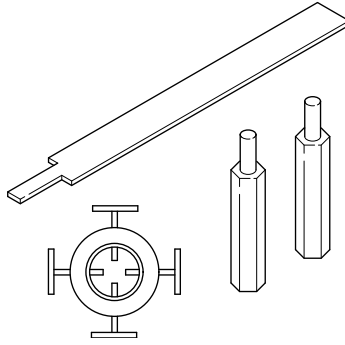
GENERAL TOOLS

SPECIAL TOOLS APPLICATIONS

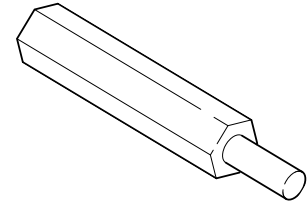
VHP	VGF	APG 1000	APG 2000/3000	AT/275GL	PART NUMBER	NAME
X	X	X	X	X	475071	Timing Light – 220V
X	X	X	X	X	494258	Slack Tube Manometer
X	X	X	X	X	495564	Depth Gauge Kit
X	X	X	X	X	494272	Torque Wrench
X	X	X	X	X	494273	Torque Wrench
X	X	X	X	X	475019	Torque Wrench Kit and Case
	X	X	X		475066	Adjustable Hook Spanner Set
X	X	X	X	X	494276	Hand-Held Digital Tachometer
X	X	X	X	X	475070	Valve Seat Grinder (220V, 50Hz)
X	X	X	X	X	494277	Valve Seat Grinder (110V, 60Hz)
X	X	X	X	X	494278	Valve Seat Dial Gauge
X	X	X	X	X	494283	Magnaflux Dye Penetrant Test Kit
X	X	X	X	X	494288	Dial Indicator Kit
X	X	X	X	X	489698	Crankshaft Deflection Gauge
X	X	X	X	X	494292	Crankshaft Deflection Gauge
X	X	X	X	X	475078	Hand-Held Oscilloscope
X		X	X	X	489943	ESM* Remote Programming Tool Kit
X	X	X	X	X	495229	Generator Alignment
X		X			472102A	Exhaust Analyzer
X	X	X	X	X	494385	Seal Removal Tool
			X	X	494498	Piston Pin Snap Ring Pliers
X	X	X	X	X	475029	O-Ring Lubricant
X	X	X	X	X	489341	High-Temperature Fluorinated Grease
X	X	X	X	X	740269	Computer to ECU Interface Cable, 8 ft (2.4 m)
X	X	X	X	X	740269D	Computer to ECU Interface Cable, 25 ft (7.6 m)
X	X	X	X	X	740269E	Computer to ECU Interface Cable, 50 ft (15.2 m)
X	X	X	X	X	740269F	Computer to ECU Interface Cable, 100 ft (30.4 m)

GENERAL TOOLS

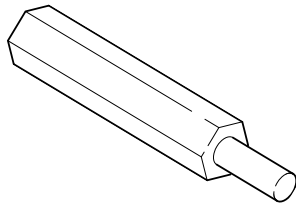
The tools in this section of the catalog can be applied to more than one Waukesha engine model series. Tools for specific engine model series can be found in their respective sections.


Spark Plug Gapping Kit
Tool No. 475033

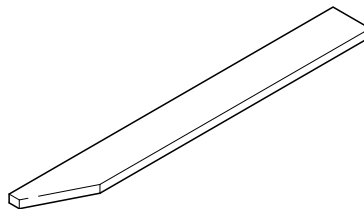
Contains all the tools required to set the gaps on a Champion RM77N 18 mm spark plug. Included in the kit is a gap setting tool for closing the gaps, a gap spreading tool and two gap setting gauges (0.010 in. and 0.020 in.).


Spark Plug Gapping Tool
Tool No. 494421
(0.010 – 0.013 GL)

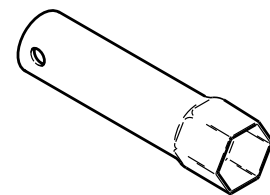
Designed to gap the Champion spark plugs with four side electrodes. Slips over the center electrode and the side electrodes are bent into the tool, gapping the plug to specification. Not recommended for gapping used plugs.


Spark Plug Gapping Tool
Tool No. 494422
(0.018 – 0.022 Standard)

Designed to gap the Champion spark plugs with four side electrodes. Slips over the center electrode and the side electrodes are bent into the tool, gapping the plug to specification. Not recommended for gapping used plugs.

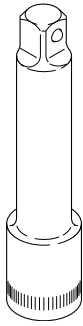

Spark Plug Spreading Tool
Tool No. 475006

This tool spreads the side electrodes. It is especially handy on Champion RM77N four electrode plugs.


Spark Plug Wrench
Tool No. 475008

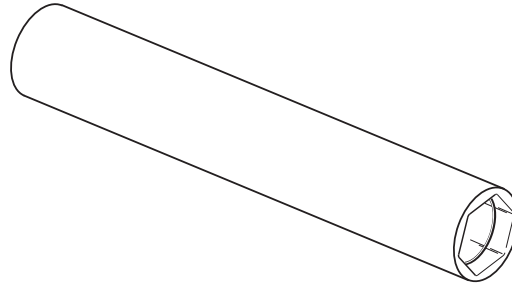
Custom designed plug socket (with 10 in. pinned extension) for CSA, shielded ignition spark plugs (7/8 in. hex). It grabs the plug's inside diameter at the upper end. This tool fits the following plugs: Shielded, CSA (integral coils).





Socket Extension
Tool No. 475035

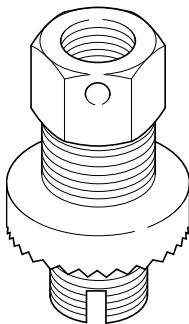
A 1/2 in. drive 5 in. pinned extension for use with spark plug socket 475037, and other 1/2 in. drive sockets.



Spark Plug Wrench
Tool No. 475037

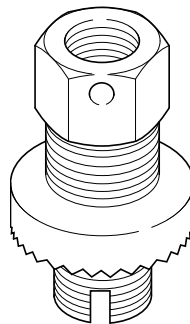
A 15-1/2 in. long, 1/2 in. drive, black oxide coated socket for use with standard 7/8 in. diameter hex plugs. Its O-ring on the inside diameter grips the hex of the plug. This socket will clear the previous VHP "pencil-sized" extensions (207927A), and plugs whose insulator boot (740011) remains attached to the plug's porcelain insulator. This socket supersedes the following sockets: 167164E, 475009, 474015. The ATGL engine also requires use of a 10 in. extension with locking pin to clear the valve cover retaining nuts. Use P/N 475008 for integral coil spark plug.

NOTE: Use P/N 475041 for replacement O-rings.



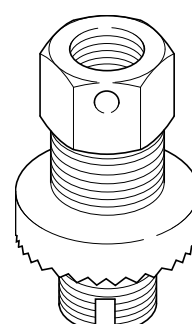
Spark Plug Thread and Seat Cleaner (18 mm / 13/16 in. Reach)
Tool No. 475065

Serves engines with 18 mm threads and 13/16 in. reach spark plugs. Current production engines are: all VGF, all ATGL and VHP GL (with 13/16 in. reach spark plug carriers).



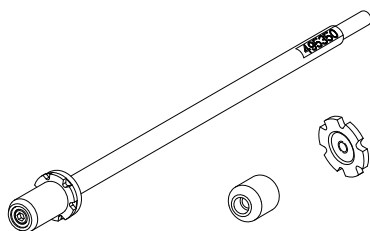
Spark Plug Thread and Seat Cleaner (18 mm / 1/2 in. Reach)
Tool No. 494087

Serves engines with 18 mm threads and 1/2 in. reach spark plugs. Current production engines are: VHP, G and GSI. Previous VHP GL and previous ATGL engines, if equipped with 1/2 in. reach carrier.



Spark Plug Thread and Seat Cleaner (14 mm)
Tool No. 494088

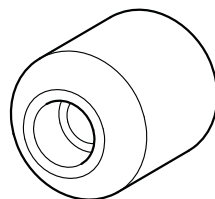
Cleans both the threads and seat to ensure good heat transfer between spark plug and cylinder head.



Spark Plug Sleeve Seat Resurfacers

Tool No. 495350

This tool is used to remove deposits from the spark plug sleeve seat of various cylinder heads after removing the sleeve. This kit includes pads and pilots for all models.



Replacement Pilots for Spark Plug Sleeve Seat Resurfacing Tool

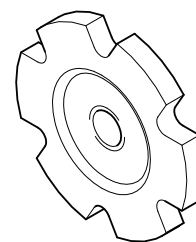
Listed are the replacement parts for the Spark Plug Sleeve Seat Resurfacing Tool 495350.

495572 - APG 1000/2000/3000, VGF

495571 - VHP

495573 - ATGL/275GL Sleeve

495574 - ATGL/275GL Head



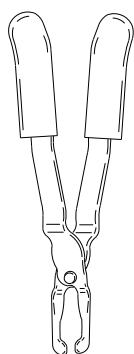
Replacement Pads for Spark Plug Sleeve Seat Resurfacing Tool

Listed are the replacement parts for the Spark Plug Sleeve Seat Resurfacing Tool 495350. Sold in bags of 10.

495570 - APG 1000/2000/3000, VGF

495569 - VHP, ATGL/275GL sleeves

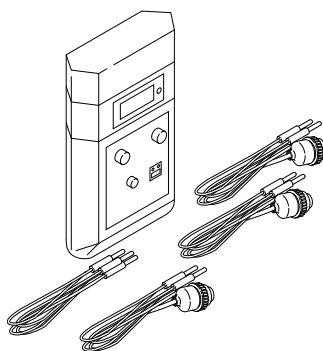
495568 - ATGL/275GL heads



Spark Plug Extension Puller

Tool No. 475075

Used for removing spark plug extensions from all Waukesha engines that feature the flange mounted coil.

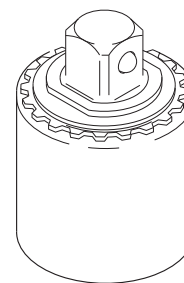


Ignition Analyzer

Tool No. 475077

Hand-held battery operated analyzer ideal for diagnosing problems with solid state ignition modules, ignition generators, coils, shielded and unshielded ignition harnesses, and ignition powered instrumentation. Detects problems such as high voltage insulation breakdown, low secondary output and coil primary resistance.

NOTE: Not available for sale in the European Union (EU)



Torquing Device

Tool No. 475031

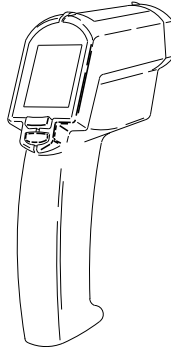
Small torque adapter that fits on 1/2 in. drive tools. This tool may be preset to any value in its range limit of 50 ft-lb. Handy for torquing spark plugs.





V-Belt Tension Tester
Tool No. 474016

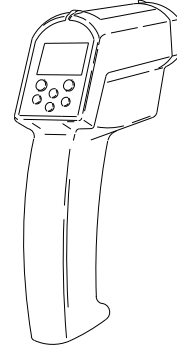
V-belt tension tester for jacket water pump, auxiliary water pump, etc.



Infrared Thermometer
Tool No. 475073A

Adjustable emissivity, visible and audible high alarm, 1% accuracy, graphic display, current and maximum temperature, 16-point laser circle and hard case.

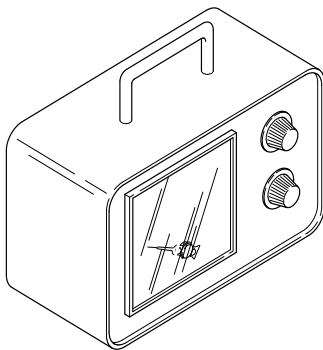
-30° to 900°C (-25° to 1600°F)



Infrared Thermometer
Tool No. 475074

More economical option. Emissivity preset at 0.95, maximum temperature range only and hard case.

-32° to 400°C (-25° to 750°F)

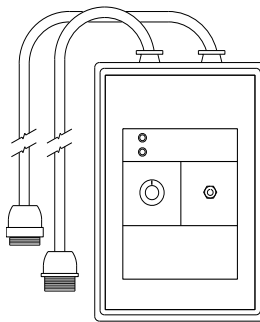


Oxygen Analyzer – 110V
Tool No. 475007

Necessity for GL engines, catalyst equipped and air/fuel ratio controlled engines. Applicable to all gas engines, for exact setting of air/fuel ratio and diagnosing engine problems. Measuring scales: 2, 15 and 25% concentration. Rechargeable, battery operated, internal pump.

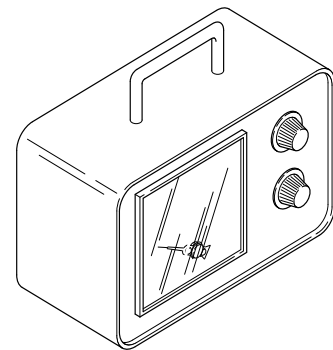
NOTE: Not available for sale in the European Union (EU)

Replacement Oxygen Cell
Tool No. 494388



CEC Ignition Tester
Tool No. 475032

For testing CEC ignition systems on all Waukesha ignition modules. Powered by ignition modules. Tests both ignition's input section (magnet wheel, Hall Effect pickup, power and wiring to ignition module), and output section (from ignition coils to spark plugs). Does more than the Hall Effect pickup tester.

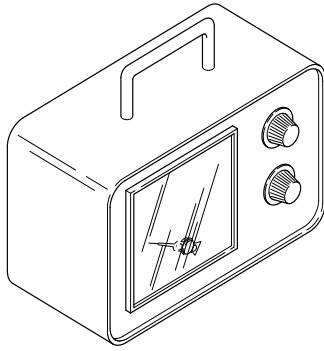


Oxygen Analyzer – 110V
Tool No. 494357

Necessity for GL engines, catalyst equipped and air/fuel ratio controlled engines. Applicable to all gas engines, for exact setting of air/fuel ratio and diagnosing engine problems. Measuring scales: 2, 15 and 25% concentration.

Replacement Oxygen Cell
Tool No. 494388

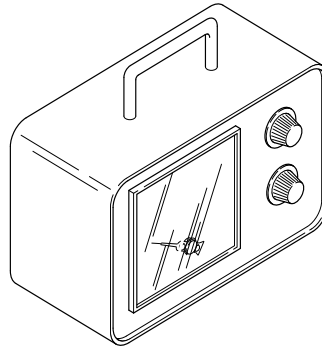




Oxygen Analyzer – 220V
Tool No. 475068

Necessity for GL engines, catalyst equipped and air/fuel ratio controlled engines. Applicable to all gas engines, for exact setting of air/fuel ratio and diagnosing engine problems. Measuring scales: 2, 15 and 25% concentration.

Replacement Oxygen Cell
Tool No. 494388

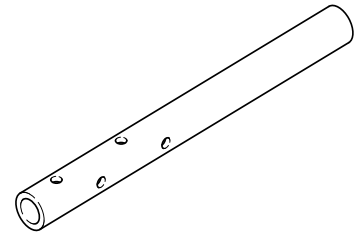


Oxygen Analyzer – 220V
Tool No. 475069

Necessity for GL engines, catalyst equipped and air/fuel ratio controlled engines. Applicable to all gas engines, for exact setting of air/fuel ratio and diagnosing engine problems. Measuring scales: 2, 15 and 25% concentration. Rechargeable, battery operated, internal pump.

NOTE: Not available for sale in the European Union (EU)

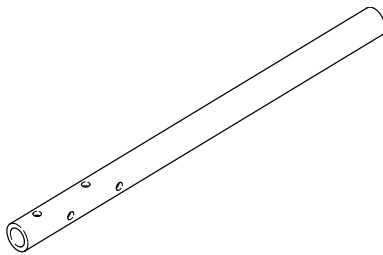
Replacement Oxygen Cell
Tool No. 494388



Exhaust Probe – 5-1/2 in.
Tool No. 494346

The use of an exhaust probe is mandatory when taking an exhaust sample. Probe can deteriorate and break after extended use and should be replaced.

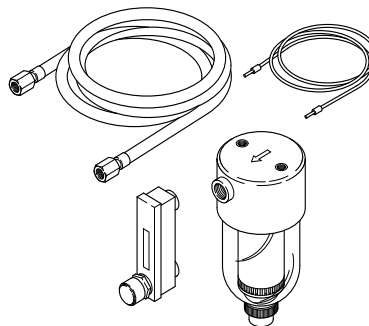
494346 is specifically for NA, VHP and smaller gas engines.



Exhaust Probe – 9 in.
Tool No. 494345

The use of an exhaust probe is mandatory when taking an exhaust sample. Probe can deteriorate and break after extended use and should be replaced.

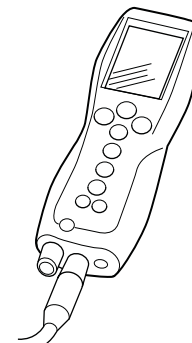
494345 is specifically for turbocharged VHP engines.



Exhaust Analyzer Accessory Kit
Tool No. 494360

This kit contains all the various items needed for exhaust analysis. This kit includes: case, fittings, hoses, probes, water trap, flow meter, etc.

NOTE: This kit does include the digital thermometer (P/N 475064), but does NOT include an analyzer(s).



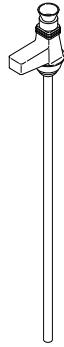
Exhaust Analyzer
Tool No. 472102A

Four-gas (CO , O_2 , NO and NO_2) analyzer used for the air/fuel setup and emission testing of engines. Includes all sensors, high-temperature sampling probe and storage case.

NOTE: Not available for sale in the European Union (EU)

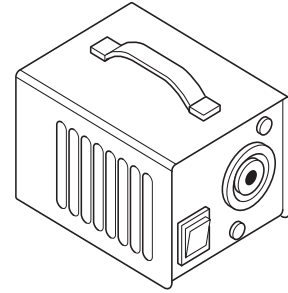
**Filters****Tool No. 475015**

Replacement filter tubes (box of 10) for emissions accessory kit, 494360.

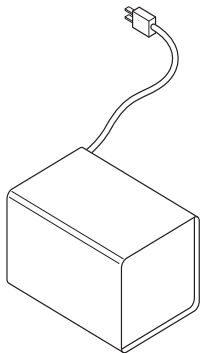
**Deluxe Engine Borescope Kit****Tool No. 475076**

Rigid borescope with swinging prism (45 – 115°) and effective length of 24-3/4 in. (63 cm). For all engines. Includes AC/DC light source and cables for field and photographic work. Brighter light allows faster shutter speeds and clearer pictures. All borescope products are special order items. Allow 4 – 6 weeks for delivery.

NOTE: No battery included. For DC operation, purchase DC Battery Pack 475022 separately.

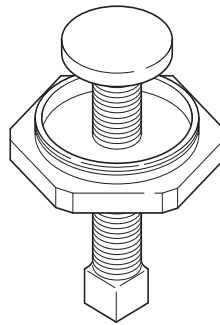
**Light Source****Tool No. 475023**

High-powered 120-volt light source and 72 in. (182 cm) cable for use with bore scope 475076. Can be used as DC light source using optional DC battery pack 475022.

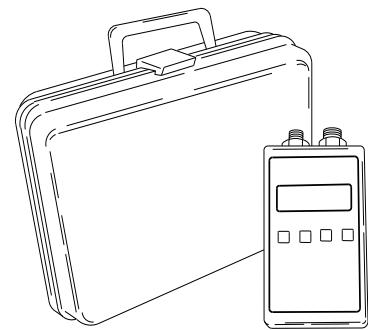
**DC Battery Pack****Tool No. 475022**

For use with 475023 light source.

NOTE: Not available for sale in the European Union (EU)

**Regulator Adjuster****Tool No. 475026**

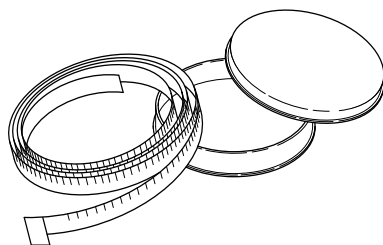
External adjustment tool for Fisher 99 series regulators. Allows adjustment without loss of turbo boost pressure.

**Smart Manometer****Tool No. 475072**

Microprocessor-based, pressure-sensing device that can measure gauge, differential, absolute or vacuum pressures, and be scaled to English or metric units for pressure.

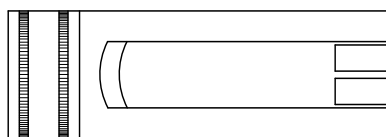
NOTE: Not available for sale in the European Union (EU)





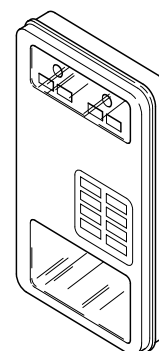
Pi Tape
Tool No. 475038

Circumference tape for measuring diameters to 0.001 in. It consists of a narrow metal ribbon with graduations that are read like a vernier scale. The tape measures 2 – 12 in. diameters. Round aluminum storage case included.



Oxygen Sensor Socket
Tool No. 475039

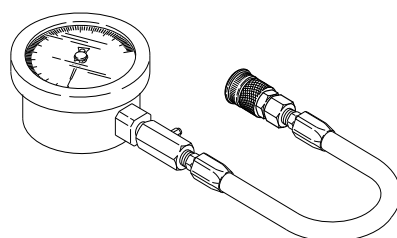
Cut-away socket for installation and removal of rich burn oxygen sensors.



Digital Thermometer
Tool No. 475064

Portable, hand-held, digital thermometer for reading J and K type thermocouples. Displays temperatures in degrees Fahrenheit or Celsius. Features include two thermocouple inputs, delta T function, hold function and record min/max function. Included is one extension cord each for J and K thermocouples. Included with P/N 494360 exhaust analyzer kit.

NOTE: Not available for sale in the European Union (EU)



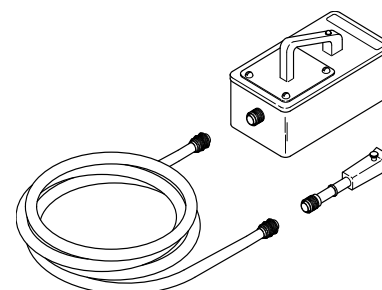
Compression Tester
Tool No. 494215

Dial registers from 0 to 250 psi in 5 lb increments. Adapters 494216, 494217 or 472996 are required for use.



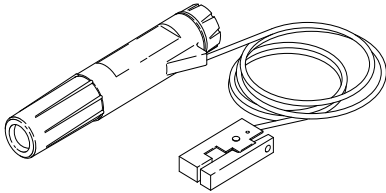
Compression Tester Adapter (18 mm)
Tool No. 494217

For use with 494215 gauge. Fits F1197, F1905, H2475, H2476, L3711, L3712, VHP, VGF.



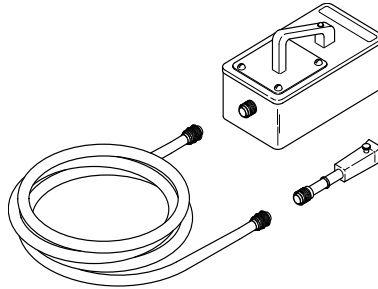
Timing Light – 110V
Tool No. 494227

CSA Class I, Group D, Div. 2 timing light approved for hazardous installations. It will plug into a Waukesha explosion proof receptacle. Includes 30 ft cord and charger. Special order item requires 12 week delivery.



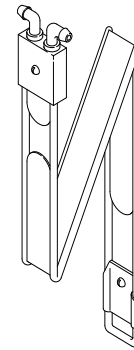
Timing Light
Tool No. 494338

This light is recommended because it can be triggered from primary breaker and breakerless magneto wiring. It is driven by two ordinary D-size flashlight batteries mounted inside the timing light. 10 ft cord included.



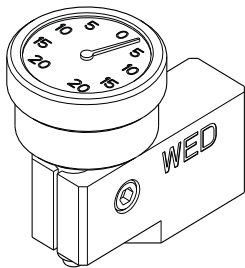
Timing Light – 220V
Tool No. 475071

CSA Class I, Group D, Div. 2 timing light approved for hazardous installations. Includes 30 ft cord and charger. Special order item requires 12 week delivery.



Slack Tube Manometer
Tool No. 494258

36 in. – may be used with water or mercury for setting gas pressures, checking turbo boost, crankcase pressure, etc.

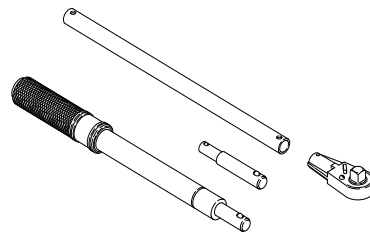


Depth Gauge Kit
Tool No. 495564

Direct reading gauge for measuring cylinder sleeve protrusion above the fire deck.

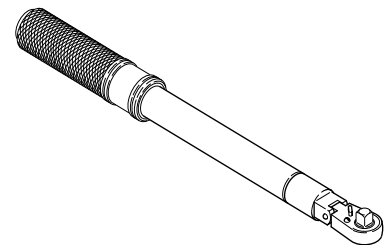
Includes: Base 495565

Gauge 495566



Torque Wrench
Tool No. 494272

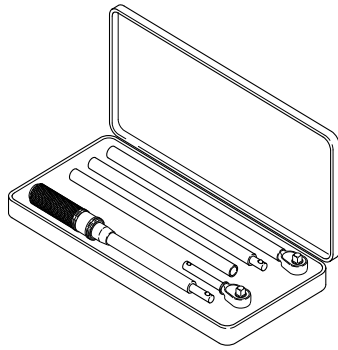
3/4 in. drive, click type, 200 to 600 lb capacity. Detachable 32-tooth rotation head.



Torque Wrench
Tool No. 494273

1/2 in. drive, click type, 40 to 250 lb capacity.

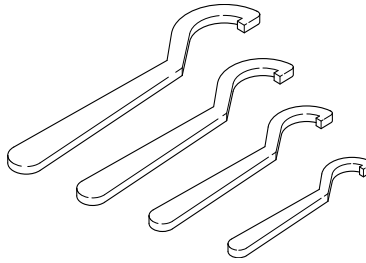
NOTE: All torque wrenches are also available in metric readings.



Torque Wrench Kit and Case
Tool No. 475019

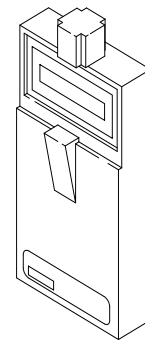
Manufactured exclusively for Waukesha. Eliminates the need for purchasing multiple torque wrenches to cover the wide range of torque values required for the VHP Series engines. Contains two torque assemblies using a common handle.

Torque ranges: 3/4 in. drive 200 – 600 ft-lb, and 1 in. drive 300 – 900 ft-lb



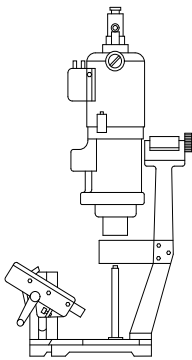
Adjustable Hook Spanner Set
Tool No. 475066

This four-piece Spanner wrench kit (with storage bag) for Deltec carburetor equipped engines. Wrenches used to loosen/tighten the various sized locknuts on Main Adjusting Screw (MAS).



Hand-Held Digital Tachometer
Tool No. 494276

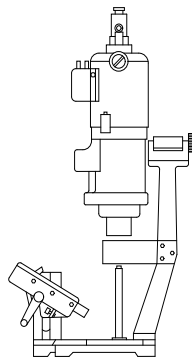
Measurement capability 50 to 30,000 rpm accuracy $\pm$ rpm. Optical type.



Valve Seat Grinder (220V, 50Hz)
Tool No. 475070

Eccentric grinder, diamond dresser, stand, necessary wrenches and a metal box.

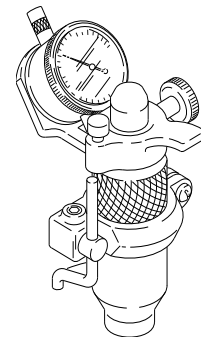
With this tool, the grinding wheel has two rotary motions. Grinding wheel speed is 3800 rpm, while making an eccentric motion of 15 rpm at the same time, resulting in "point" grinding. Use of this tool is the only factory-approved service method. Pilots and grinding wheels required.



Valve Seat Grinder (110V, 60Hz)
Tool No. 494277

Eccentric grinder, diamond dresser, stand, necessary wrenches and a metal box.

With this tool, the grinding wheel has two rotary motions. Grinding wheel speed is 3800 rpm, while making an eccentric motion of 15 rpm at the same time, resulting in "point" grinding. Use of this tool is the only factory-approved service method. Pilots and grinding wheels required.

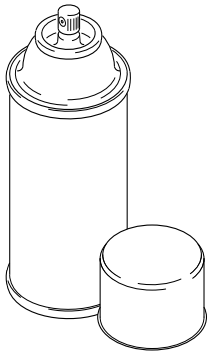


Valve Seat Dial Gauge
Tool No. 494278

Graduated in thousandths to show at a glance the accuracy of the valve seat after grinding.

Pilot required for use.

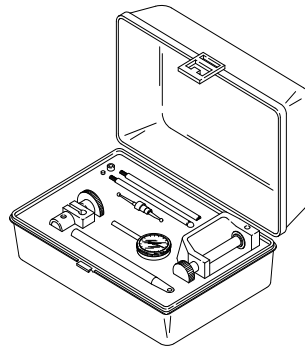




Magnaflux Dye Penetrant Test Kit
Tool No. 494283

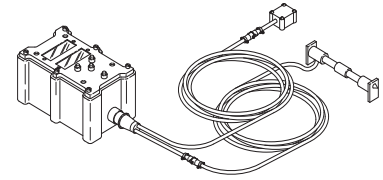
Simple spray can application detects cracks in engine components.

Kit consists of four cans of cleaner, two cans of penetrant, and two cans of developer, plus instructions and carrying case.



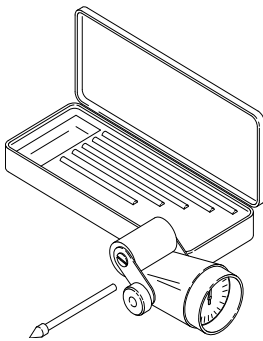
Dial Indicator Kit
Tool No. 494288

Measures in thousandths. Many uses including checking crankshaft end play, gear backlash and engine alignment.



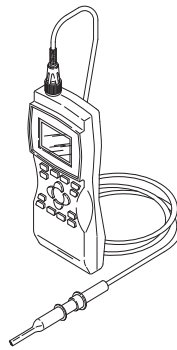
Crankshaft Deflection Gauge
Tool No. 489698

Measures the amount of crankshaft flexing. This is necessary for engines on spring isolators. The digital indicator is normally outside of the engine. A 15 ft cable provides power and signal connections to the measuring head. Accuracy is 0.05 mils plus 2% of reading. This gauge is battery-powered and metric.



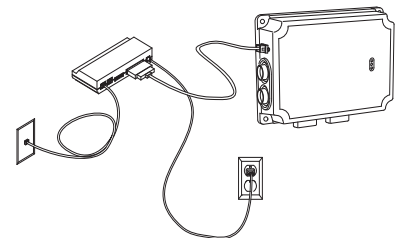
Crankshaft Deflection Gauge
Tool No. 494292

This is a mechanical type analog instrument similar to a dial indicator. This kit has many extensions to accommodate any size crankshaft (graduated in inches).



Hand-Held Oscilloscope
Tool No. 475078

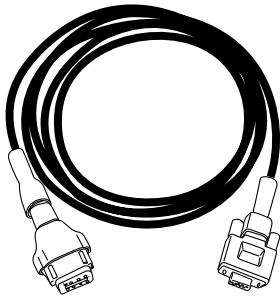
This handy, easy-to-use, low-cost scope has an LCD display, high sensitivity down to 0.1 mV, full auto setup function, 10 mHz sampling rate, 27 DVM readouts with x10, 5mV to 20mV/div, 200ns to 1 hour/div time base, and more. Battery powered. AC adapter and hard-shell case included.



ESM Remote Programming Tool Kit
Tool No. 489943

This kit includes the phone modem, phone line, power cables, the modem to the ECU and the instruction sheet.

NOTE: Not available for sale in the European Union (EU)



Computer to ESM / ECU Interface Cable

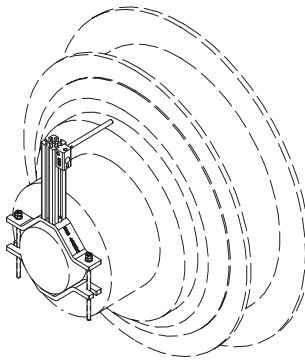
This cable is used to connect a computer to the ESM/ECU when using the Electronic Service Program (ESP) to set parameters, view or reset codes, or utilize any other ESP features. Available in 25 ft, 50 ft or 100 ft lengths.

740269 - Computer to ECU Interface Cable, 8 ft (2.4 m)

740269D - Computer to ECU Interface Cable, 25 ft (7.6 m)

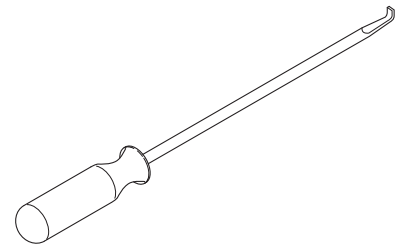
740269E - Computer to ECU Interface Cable, 50 ft (15.2 m)

740269F - Computer to ECU Interface Cable, 100 ft (30.4 m)



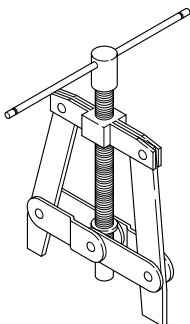
Generator Alignment Tool No. 495229

This tool is used to align generators to Waukesha engines. It may also work on pumps, compressors and competitor units. Includes two indicators and swivel clamps.



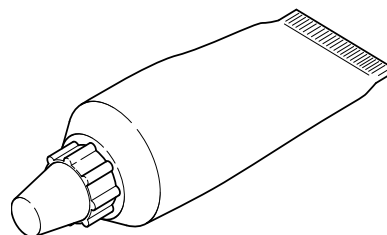
Seal Removal Tool Tool No. 494385

Removes the seal under the prechamber, admission valves and spark plug holders. Also good for removing valve seats from liquid nitrogen.



Piston Pin Snap Ring Pliers Tool No. 494498

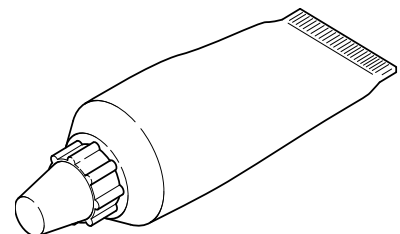
This plier is sized right for the large piston pin retaining clip.



O-Ring Lubricant Tool No. 475029

This lubricant is Waukesha-approved and recommended for all O-rings.

See latest edition of *Service Bulletin* 6-2560 for details. 2 oz tube.



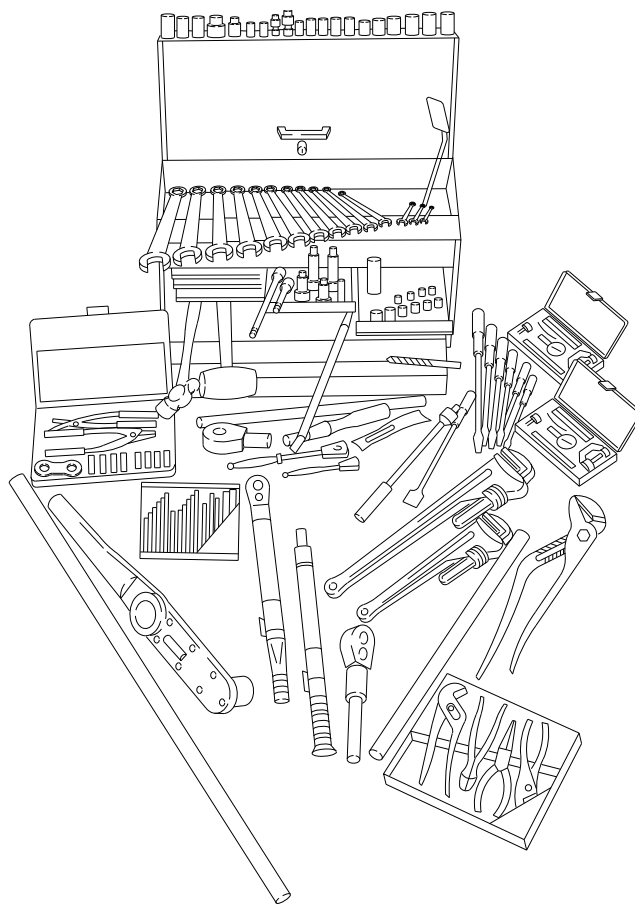
High-Temperature Fluorinated Grease Tool No. 489341

This dielectric grease is used on ignition systems at the spark plug insulator and boot.



275GL / ATGL TOOLS

The tools in this section are specific to the 275GL & ATGL engine series.


275GL / ATGL Hand Tool Kit
Tool No. 473044

Professional-quality hand tools are simply unavailable in many parts of the world.

Many ATGL customers who intend to do their own service and repair want to have the necessary tools on location, but do not desire to invest in more than is necessary.

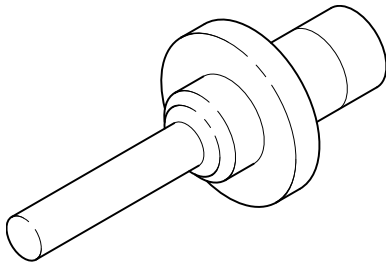
In response to these needs, Waukesha has developed a kit of specially selected, professional-quality tools necessary for the repair and maintenance of ATGL series engines.

This kit contains 128 pieces including a 40 in. wide tool chest:

Tools include:

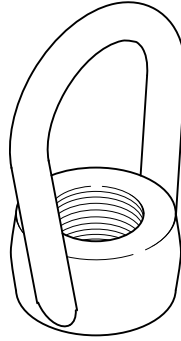
- Torque wrenches to 1,000 ft-lb
- Metric sockets in 3/8 in., 1/2 in. and 3/4 in. drive
- Ratchets and extensions
- Selected screwdrivers
- Metric wrenches
- Selected punches and chisels
- Selected pipe wrenches
- Selected adjustable wrenches
- Selected pliers
- Selected prybars
- Selected hammers





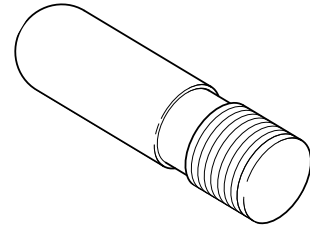
Valve Seat Insert Installation Tool
Tool No. 292583

Fitting of the intake and exhaust valve seat can be accomplished with this tool.



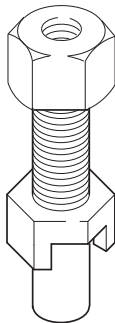
Cylinder Head Lifting Eye
Tool No. 292630

22 mm lifting eye used for lifting the cylinder head (includes two).



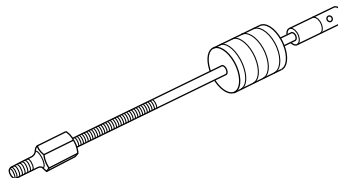
Connecting Rod Guide Pin
Tool No. 292779

Made of nylon and prevents scratching the engine cylinder sleeve when removing or replacing the connecting rod.



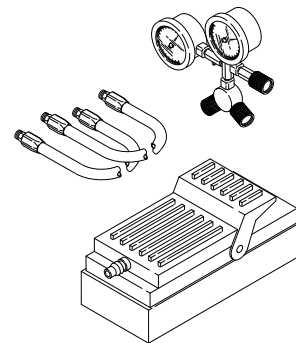
Water Guide Sleeve Disassembly Tool
Tool No. A292511

Updated puller (2015) utilizes admission valve puller 473046 to pull straight up on the water guide for easy removal.



Admission Valve Puller
Tool No. 473046

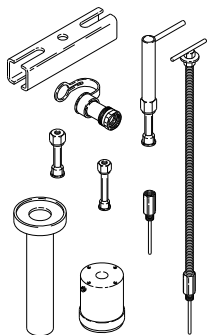
Used to remove the admission valve from ATGL/275GL cylinder heads. Replaces 495684. Also used with A292511 water guide puller.



Hydraulic Pump Kit
Tool No. A292539

This pump contains a pneumatic foot operated hydraulic pump, pressure gauges, supply air oiler, pressure regulator and hydraulic hoses.

Replacement Gauge
Tool No. 473036

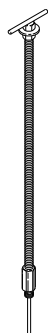


Prechamber Remover Kit
Tool No. 494538 (AT25GL)
Tool No. 473016 (AT27/275GL)

Extracts the spark plug and prechamber. Must be used with hydraulic pump kit A292539.

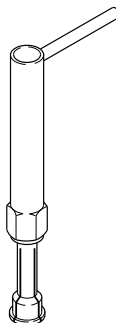
For your convenience we are offering this as a kit and supplying individual part numbers for replacement purposes (see Part Numbers 473020 through 473028).

Prechamber Remover Replacement Part Numbers			
Part Number	AT25	AT27/275GL	Description
494538	X		Prechamber Puller Kit – AT25GL
473016		X	Prechamber Puller Kit – AT27GL/275GL
473020	X	X	Threaded Screw Assembly with Exp. Rod
473022	X	X	Small Collet with Ext. Tube, 1-1/4 – 1-1/2 in.
473023	X		Large Collet, 1-1/2 – 1-3/4 in.
473032		X	Small Collet, 1-1/4 – 1-1/2 in.
473025	X	X	Hydraulic Ram Adapter
473026	X	X	Yoke
473027	X	X	20-ton Hydraulic Ram
473028	X	X	Coupler for Hydraulic Ram



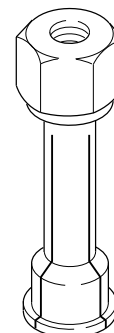
Threaded Screw Assembly with Exp. Rod
Tool No. 473020

Included in Kit 494538 and 473020.



Small Collet with Ext. Tube, 1-1/4 – 1-1/2 in.
Tool No. 473022

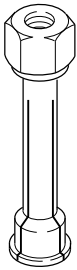
For pulling AT25/AT27/275GL ignitor sleeve, and for pulling AT27/275GL prechamber cup.



Large Collet, 1-1/2 – 1-3/4 in.
Tool No. 473023

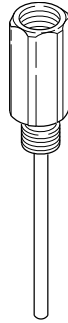
For pulling AT25GL spark plug holder.



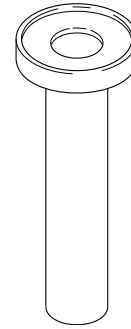


Small Collet, 1-1/4 – 1-1/2 in.
Tool No. 473032

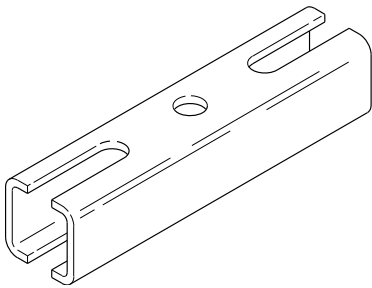
For pulling AT27GL / 275GL spark plug holder.



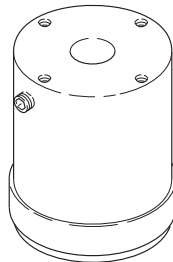
Expanding Rod for Collets
Tool No. 473024



Hydraulic Ram Adapter
Tool No. 473025

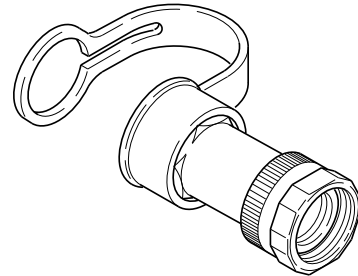


Yoke
Tool No. 473026

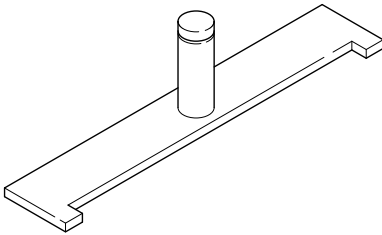


Hydraulic Ram – 20 Ton
Tool No. 473027

Must be used with Hydraulic Pump Kit A292539.

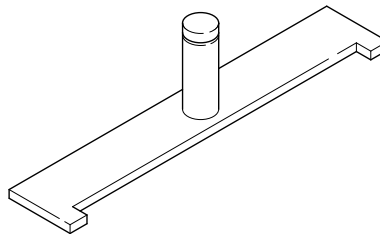


Coupler for Ram
Tool No. 473028



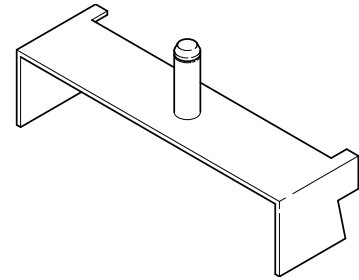
Main Bearing Turning Device
Tool No. A295137

Turns main bearing shells in and out.



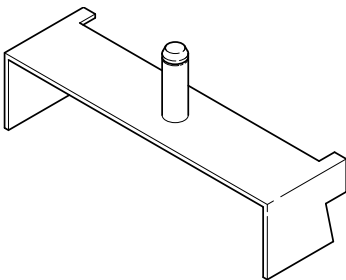
Main Bearing Turning Device
Tool No. A292587

Turns main bearing shells in and out.



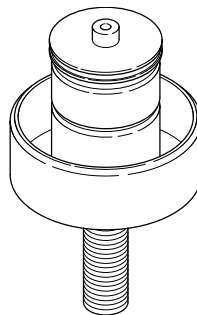
Thrust Bearing Turning Device
Tool No. A295138

Turns thrust bearing in and out.



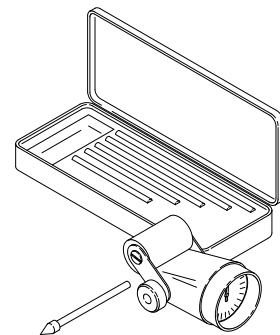
Thrust Bearing Turning Device
Tool No. A292591

Turns thrust bearing in and out.



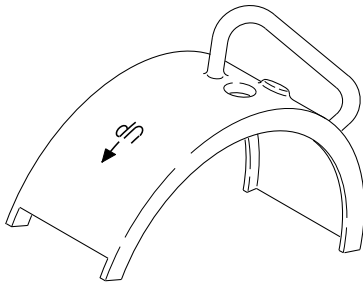
Valve Seat Insert Removing Tool
Tool No. A292669

Extracts intake and exhaust valve seats from the cylinder head.



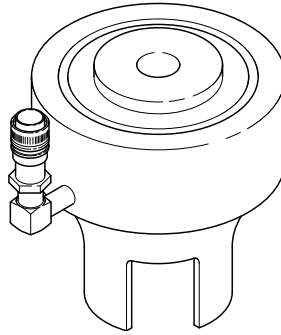
Crankshaft Deflection Gauge
Tool No. A292683

Measures crankshaft distortion caused by crankcase deflection (metric).



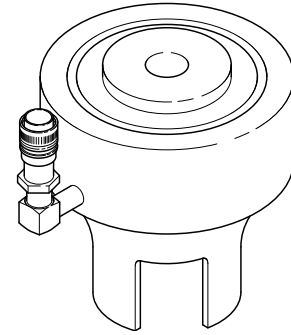
**Connecting Rod Bearing
Installation Tool**
Tool No. A292696A

Correctly positions the connecting rod bearing shells during installation.



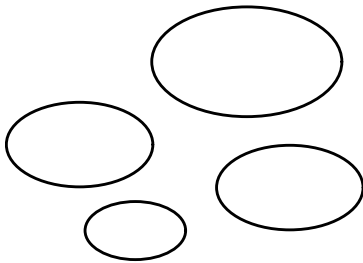
**Connecting Rod Hydraulic Jacks
(Inline engines)**
Tool No. A295140 (Set of 2)

Set of two hydraulic jacks for preloading the connecting rod studs on inline engines. Must be used with A292539 hydraulic pump kit. (4 in. tall)



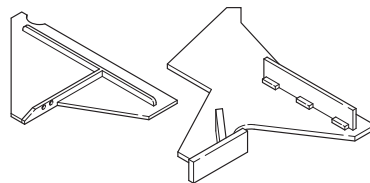
**Connecting Rod Hydraulic Jacks
(Vee engines)**
Tool No. A292704 (Set of 2)

Set of two hydraulic jacks for preloading the connecting rod studs on vee engines. Must be used with A292539 hydraulic pump kit. (6-1/4 in. tall)



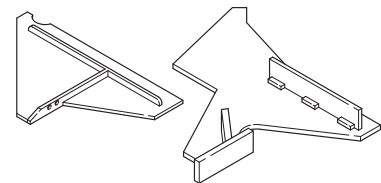
**Hydraulic/Connecting Rod
Repair Kit**
Tool No. A472995

This kit contains all hydraulic seals capable of rebuilding one connecting rod hydraulic jack for either the A292704 (vee) or A295140 (inline) connecting rod jacks.



**Camshaft Mounting Device
(Inline engines)**
Tool No. A295322 (Set of 2)

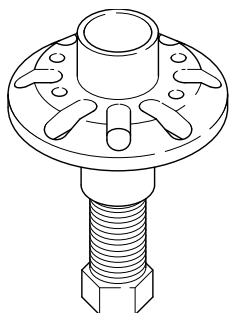
Completely removes the camshaft. The camshaft is lowered onto this tool and rolled out onto the rest notches.



**Camshaft Mounting Device
(Vee engines)**
Tool No. A292804 (Set of 2)

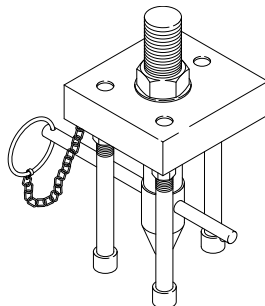
Completely removes the camshaft. The camshaft is lowered onto this tool and rolled out onto the rest notches.





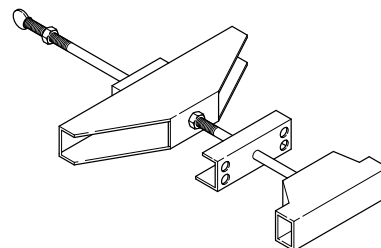
Pump Gear Disassembly Tool
Tool No. A292848

Removes the drive gear from the shaft of the oil pump, cooling water pump and the diesel fuel delivery pump.



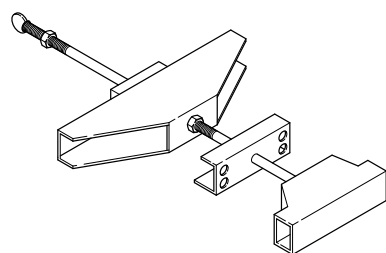
Spring Compressor
Tool No. AA292579

Used during dismantling and fitting inlet and exhaust valves.



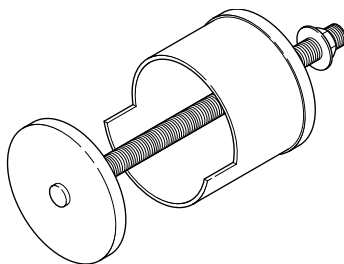
Sleeve Puller/Installer (AT25GL)
Tool No. AA292593

Removes cylinder sleeves from the crankcase.



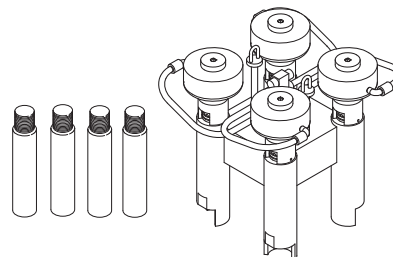
Sleeve Puller/Installer (AT27GL)
Tool No. 473002

Removes cylinder sleeves from the crankcase.



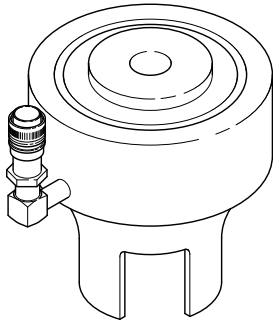
Connecting Rod Bushing Removing Tool
Tool No. AA292699

Removes the small end bearing in the connecting rod.



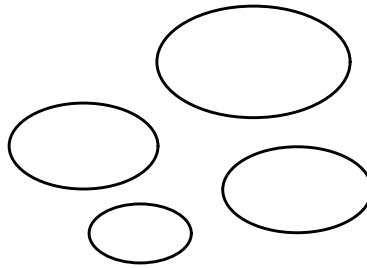
Cylinder Head Hydraulic Mounting Fixture
Tool No. AA293268

Preloads the cylinder head studs. Any two of the hydraulic jacks are removable to load the main bearing cap studs. All four cylinder head studs are preloaded together. Includes Tool No. 494497 tommy bar. Requires hydraulic pump kit A292539, sold separately.



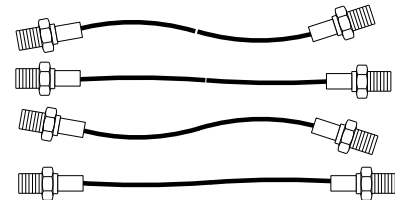
**Head/Main Bearing
Replacement Ram**
Tool No. A292514

This tool is the single replacement jack for the AA293268 cylinder head fixture. These jacks can also be used in pairs on the main bearing cap studs.



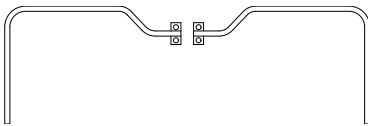
Main/Head Jack Repair Kit
Tool No. 472994

This kit contains all hydraulic seals capable of rebuilding one hydraulic jack of the AA293268 cylinder head/main bearing hydraulic fixture.



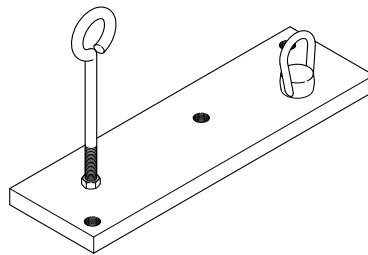
Replacement Hoses
Tool No. 473015

Four (4) replacement hoses for cylinder head hydraulic mounting fixture AA293268.



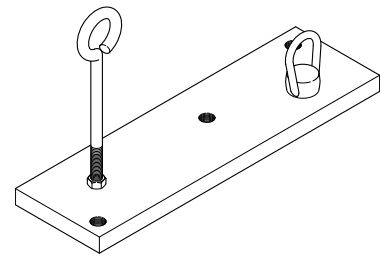
Main Bearing Cap Lifting Device
Tool No. AA295135

Lifting device for main bearing caps. Due to the weight of the main bearing caps, this tool is absolutely necessary to work on the engine safely.



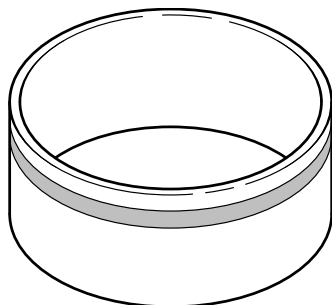
**Piston, Connecting Rod Lifting
Device**
Tool No. C292774 (AT25GL)

Lifts the piston and connecting rod during removal and installation. Includes mounting capscrews and 10 mm carbon cleaning tap.



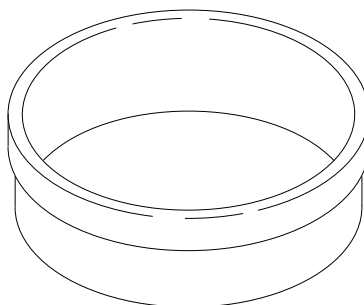
**Piston, Connecting Rod Lifting
Device**
Tool No. 473001 (AT27GL)

Lifts the piston and connecting rod during removal and installation. Includes mounting capscrews and 10 mm carbon cleaning tap.



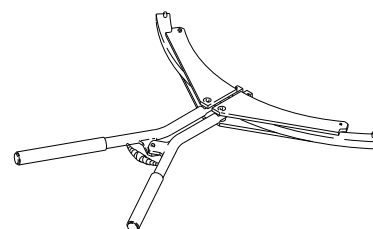
Piston Ring Compressor
Tool No. 472990 (AT25GL)

This is a solid type compressor.



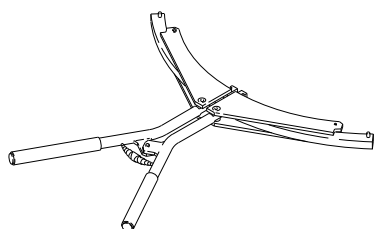
Ring Compressor
Tool No. 473017 (AT27GL)

Special ring compressor fits into the anti-polishing ring groove in the liner allowing for easier installation (necessary for production engines built after September, 1999).



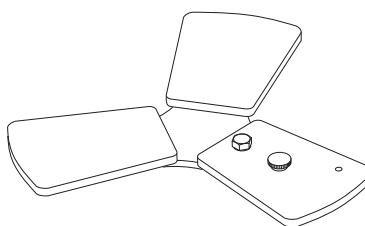
Piston Ring Expander (AT25GL)
Tool No. 473031

Prevents twisting and/or over-expanding that can lead to ring damage.



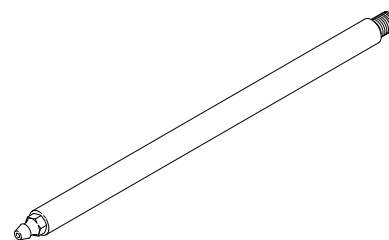
Piston Ring Expander (AT27GL)
Tool No. 473018

Prevents twisting and/or over-expanding that can lead to ring damage.



Anti-Polishing Ring Removal Tool
Tool No. 296492

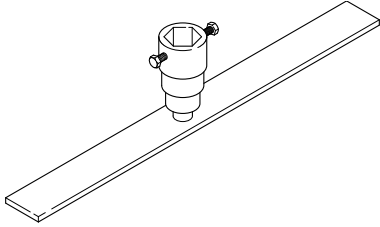
An adjustable device designed to fit into three slots in the anti-polishing ring, allowing for a firm pulling surface for easier removal of the ring. This tool is used on the current AT27GL.



Compression Tester Adapter
Tool No. 472996

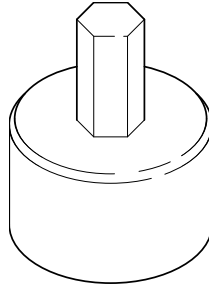
18 mm rigid (metal) adapter.





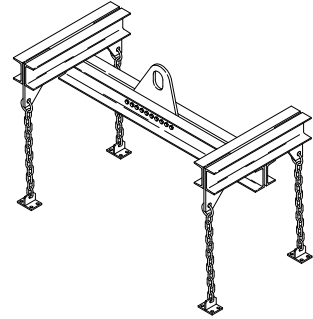
Gear Backlash Adjustment Tool
Tool No. 473005

Tool mounts onto water pump or oil pump for measuring gear backlash. See latest editions of *Service Bulletin 4-2554* and *Service Bulletin 12-2623* for instructions.



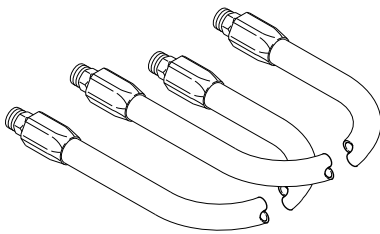
Stud Installer
Tool No. 473010

Threaded tool that allows the installation of cylinder head and main bearing studs into the crankcase.



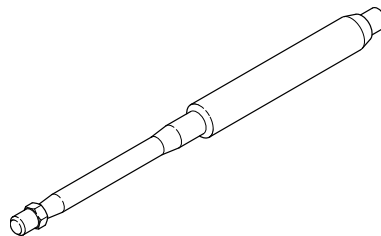
Spreader Beam
Tool No. 295174D

Certified lifting fixture. Lifting capacity includes all ATGL engines from 8 to 16 cylinders. It accommodates both vee and in-line style engines (the unit is convertible). This spreader beam weighs 3,840 lb (1,741 kg). This part includes 293303B (lifting support, quantity of 4), 291811 (nut, quantity of 16) and 293311B (clevis, quantity of 4).



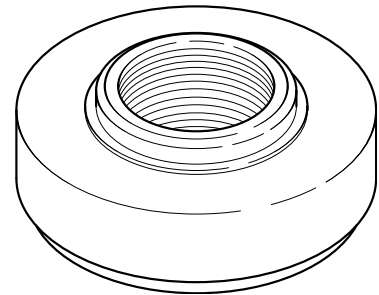
Replacement Hydraulic Hose
Tool No. 473014

Replacement hose for A292539 hydraulic pump kit.



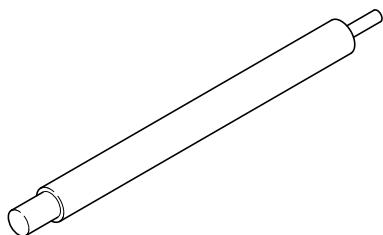
Valve Guide Pilot
Tool No. 494448

Used when grinding the seats with the 494277 grinder (see General Tools).



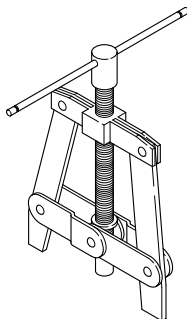
Seat Grinding Stone
Tool No. 494487

This is a 30° seat grinding stone.



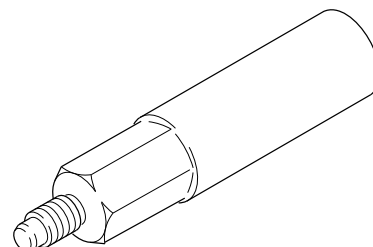
Tommy Bar
Tool No. 494497

Turns hydraulically tightened fastener collars. One size fits all holes. Included with AA293268 head fixture.



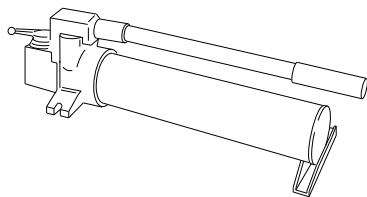
Piston Pin Retaining Clip Plier
Tool No. 494498

This plier is sized right for the large piston pin retaining clip.



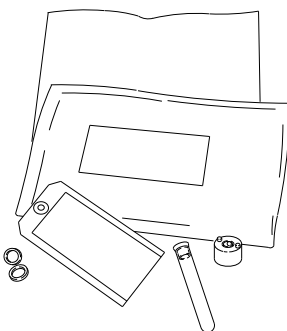
Camshaft Gear Adjusting Tool
Tool No. 473033

Used with 473034 pump kit. Pump is then used to float gear for timing adjustments of camshafts. See latest edition of *Service Bulletin 15-2845*.



Camshaft Gear Pump Kit
Tool No. 473034

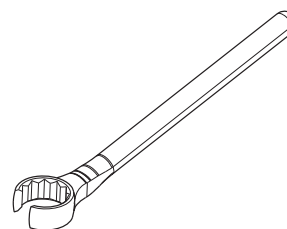
High pressure pump kit used with 473033 adapter to float cam gear for camshaft timing adjustments. Pump includes tubings, gland nut sleeve and elbow.



Damper Fluid Sample Kit
Tool No. 473029

For collecting damper fluid samples on Hasse & Wrede Dampers (P/N 293835F). Includes sample container, instructions, damper extraction plug, two plug seals, tech data label and mailing envelope.

See latest edition of *Service Bulletin 5-2818*.



Turbocharger Water Connection Wrench
Tool No. 472082

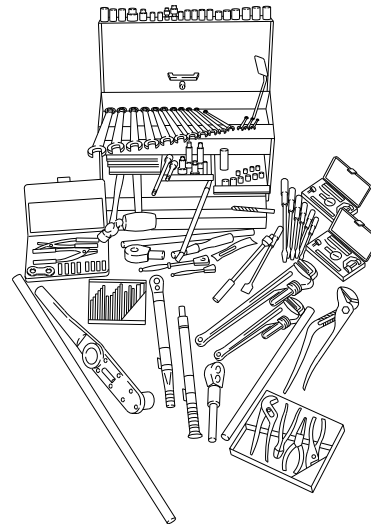
1-1/2 in.

This tool is used to remove and install the prechamber fuel lines and turbocharger water & oil connections.



VHP TOOLS

The tools in this section are specific to the VHP Engine series.


VHP Hand Tool Kit
Tool No. 494261

Professional-quality hand tools are simply unavailable in many parts of the world.

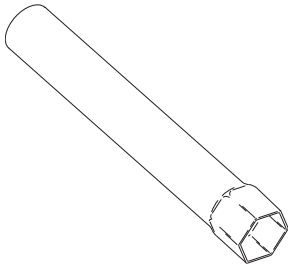
Many VHP customers who intend to do their own service and repair want to have the necessary tools on location, but do not desire to invest in more than is necessary.

In response to these needs, Waukesha has developed a kit of specially selected, professional-quality tools necessary for the repair and maintenance of VHP series engines.

This kit contains 84 pieces including a 12-drawer chest with custom-designed drawer inserts promoting tool management and control. Tool control reduces tool losses, promotes productivity and brings tool investment costs in line with operations.

Tools include:

- Selected combination box-open end wrenches
- Selected socket wrenches (3/8, 1/2 and 1 in. drive sizes)
- Three torque wrenches from 40 to 900 ft-lb
- Socket wrench drivers
- Extensions and universal joints
- Breaker bar
- Compothane hammer
- Chisel and punch set
- Roller head pry bar
- Feeler gauge set
- Two dial indicator sets
- Telescoping mirror
- Gasket scraper
- Selected screw drivers
- Selected pliers
- Selected pipe wrenches
- Selected adjustable wrenches
- Ball-peen hammer
- Reducer
- Parts cleaning brush

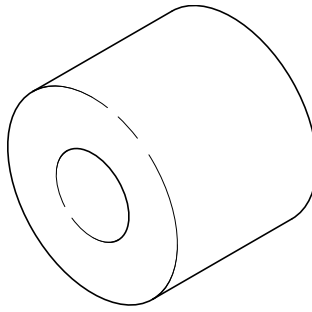


Spark Plug Wrench
Tool No. 167164D

This 1 in. socket with 10 in. extension for installing spark plugs is used with the following plugs:

CSA, Shielded, 60999G, N with F.M. Coils: (RTM-77N with 1 in. hex)

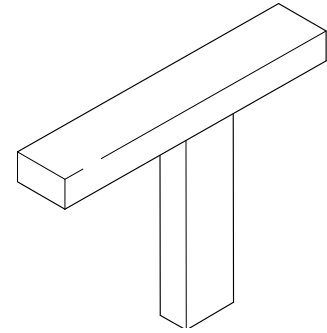
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Camshaft Dummy Gear
Tool No. 474000

Aluminum "dummy" spacer mounts in place of the camshaft drive gear to allow easy camshaft endplay adjustment without installing and then reheating the gear to remove it.

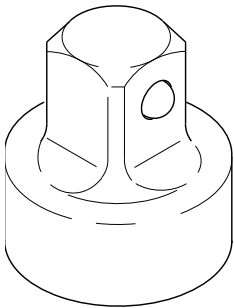
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Camshaft Bearing Roll-Out Tool
Tool No. 474001

Inserts into the camshaft oil hole to allow "rolling out" of the lower cam bearing with the camshaft in place. "Tee" shaped brass tool.

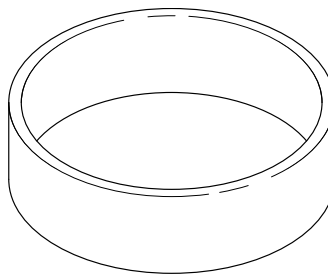
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Reducer
Tool No. 474003

1 in., 3/4 in. out, for adapting 1 in. torque wrench to 3/4 in. drive socket. Allows torquing VHP heads without removing rocker arms.

8-1/2 in. Bore	9-3/8 in. Bore
•	•



Stop Sleeve
Tool No. 474005

Allows the safe removal of the front crankshaft pulley. The hardened steel ring installs behind the crankshaft front plate to separate the pulley, taper and wear sleeve.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

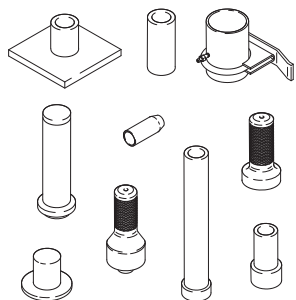


Spark Plug Carrier Remover Tool
Tool No. 474008

This "easy out" tool removes broken spark plug carriers when the use of spark plug carrier tool is impossible.

8-1/2 in. Bore	9-3/8 in. Bore
•	•





Water Pump Rebuilding Kit Tool No. 474013

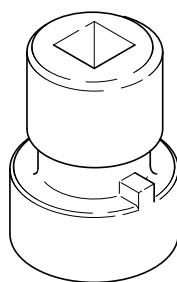
Tool kit for assembly of 6- and 12-cylinder water pumps P/N A-200960-D with double row bearings. Made up of seal fix drivers, shaft, bearing installation tools and holding fixture.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

Replacement Parts for 474013

495261 - Sleeve, Seal Protector

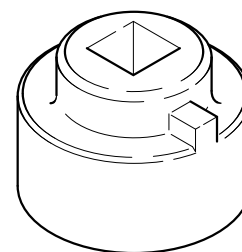
495262 - Driver, Carbon Seal



Spark Plug Carrier Removal Tool Tool No. 474036

Removes and installs spark plug carrier on non-CSA head GL series only (use with 3/4 in. drive).

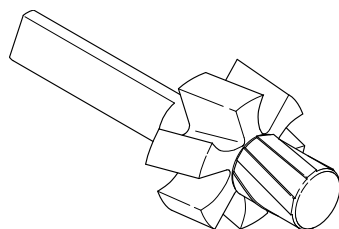
8-1/2 in. Bore	9-3/8 in. Bore
•	•



CSA Spark Plug Carrier Tool Tool No. 474023

Removes and installs spark plug carrier (use with 3/4 in. drive).

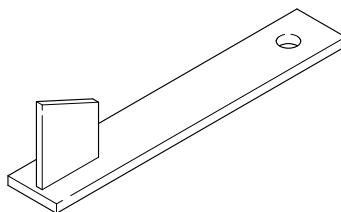
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Rocker Arm Spotface Tool No. 474026

Machine clearance on existing rocker arms for new adjusting screw ball socket.

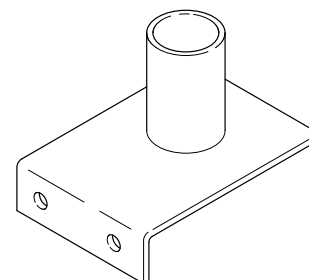
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Timing Disc Locator Tool No. 474024

Locates the CEC timing disc on P9390.

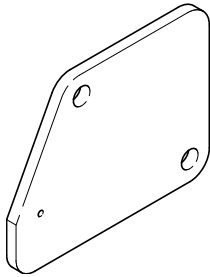
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Drill Guide Tool No. 475014

Allows user to precisely drill and tap a hole in the governor housing for the installation of the CEC ignition module Hall Effect pick-up. This tool is for the VHP 6- and 12-cylinder engines only.

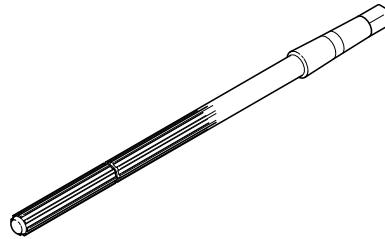
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Pick-up Location Guide / Cam Bearing Rollout Tool
Tool No. 474025

Positions the correct location of the CEC ignition module Hall Effect pick-up for the P9390.

8-1/2 in. Bore	9-3/8 in. Bore
	•

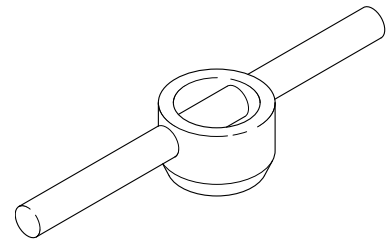


Valve Guide Reamer
Tool No. 474046

Carbide tip will ream several thousand guides before replacement. Much harder and longer lasting than tool steel.

NOTE: Cannot be used on hardened landfill guides

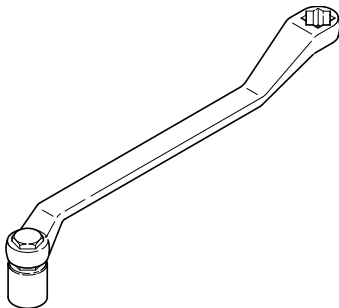
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Guide Reamer T-Handle
Tool No. 474012

Used with 474046 valve guide reamer.

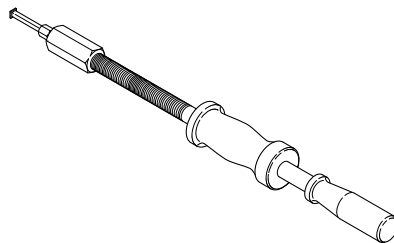
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Adjusting Wrench for Series Two
Tool No. 494287

Removes cover bolts and adjusts valves. Offset protects user's hands. For Series Two only.

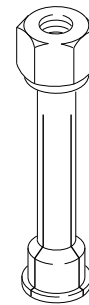
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Prechamber Removal Tool
Tool No. 494290

Expanding collet grips the ID of the prechamber. Slide hammer pulls it free. 5108GL also requires 474007 collet.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

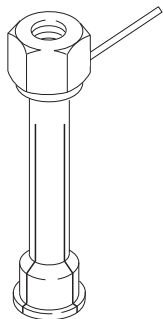


Prechamber Removing Collet
Tool No. 474007

Required with 494290 prechamber removal tool.

For 5108GL only.

8-1/2 in. Bore	9-3/8 in. Bore
•	

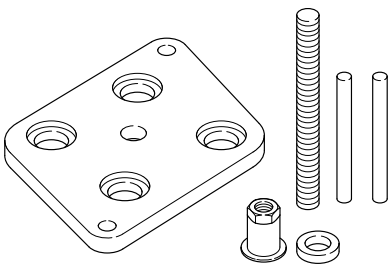


Prechamber Removing Collet
Tool No. 490049

Required with 494290 prechamber removal tool.

VHP GLs not including the 5108GL.

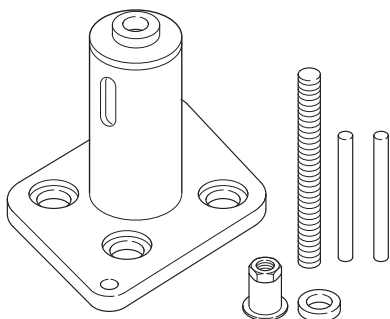
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Spring Compressor
Tool No. 474031

Compresses all 4 valve springs on the cylinder head. The 474031 tool will not work with the current GL CSA ignition system with the flange-mounted coil. Consists of plate, 2 pins, center stud, nut and bearing. For use with Non-CSA Ignition. See latest edition of *Service Bulletin 15-2758*.

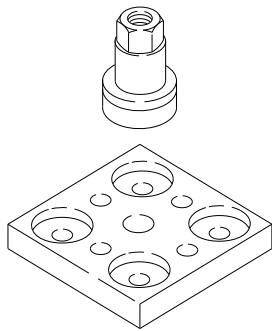
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Spring Compressor
Tool No. 474033

Compresses all 4 valve springs on the cylinder head. Consists of plate, 2 pins, center stud, nut and bearing. For use with GL CSA Ignition only. See latest edition of *Service Bulletin 15-2762*.

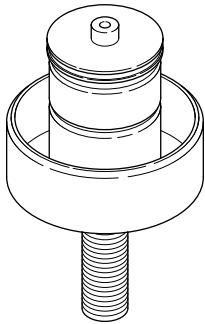
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Spring Compressor – 4-Valve for Series Four*
Tool No. 474034

Compresses all four valve springs at once. May be used with the cylinder heads on or off the engine. For Series Four only.

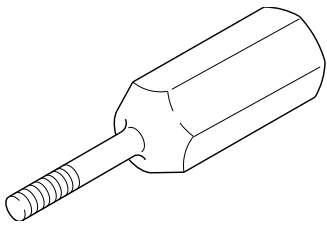
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Seat Extractor for Series Four
Tool No. 474038

Extracts intake and exhaust valve seats from the VHP Series Four cylinder. For Series Four only.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

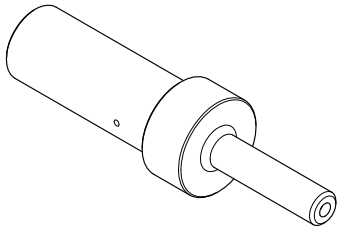


Valve Bridge Guide Puller for Series Four
Tool No. 474040

Removes valve bridge pins from Series Four VHP cylinder head. Use with 494290 slide hammer. For Series Four only.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

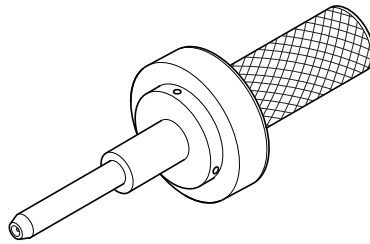
* Trademark of General Electric Company



Bridge Guide Pin Driver
Tool No. 495330 (was TL84308)

This tool allows the valve bridge guide pins to be installed properly to the correct depth.

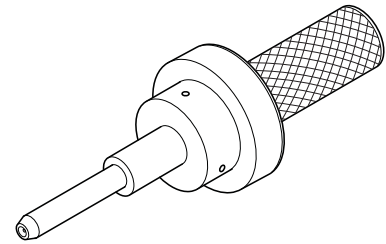
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Intake Valve Seat Installer
Tool No. 495328 (was TL82981)

This tool allows for the precision alignment and installation of chilled Series Four intake valve seats, and Series Two intake and exhaust valve seats, into the cylinder head.

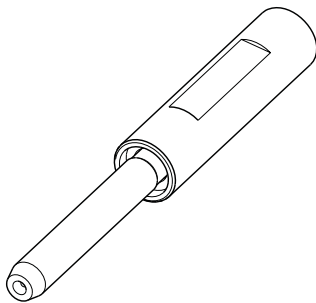
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Exhaust Valve Seat Driver
Tool No. 495329 (was TL82982)

This tool allows for the precision alignment and installation of chilled Series Four exhaust valve seats into the cylinder head.

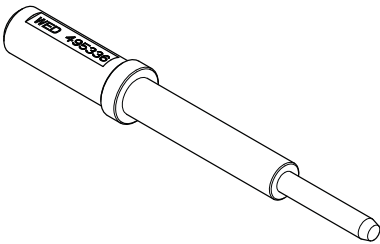
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Stem Seal Installer
Tool No. 495327 (was TL82158)

This tool is used to align and install the all current VHP valve seals.

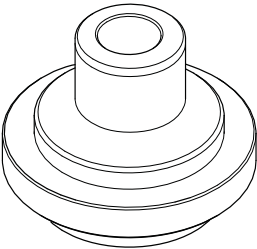
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Valve Guide Removal and Installation Tool – Arbor
Tool No. 495336**

This tool is used with guides 495497 and 495498.

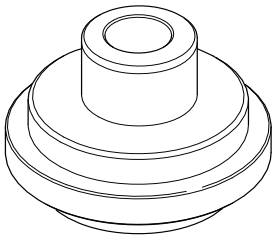
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Valve Guide Removal and Installation Tool – Guide
Tool No. 495497**

This tool is used with arbor 495366 and for use with non-Series Four cylinder heads.

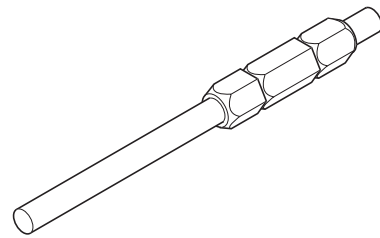
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Valve Guide Removal and Installation Tool – Guide
Tool No. 495498**

This tool is used with arbor 495366 and for use with Series Four cylinder heads.

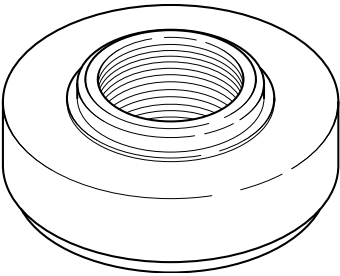
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Valve Guide Straightness Gauge
Tool No. 474044**

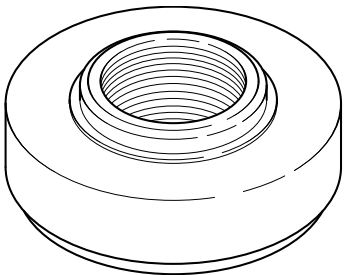
This tool is used to check new valve guides for straightness after they have been installed in the cylinder head.

8-1/2 in. Bore	9-3/8 in. Bore
•	•



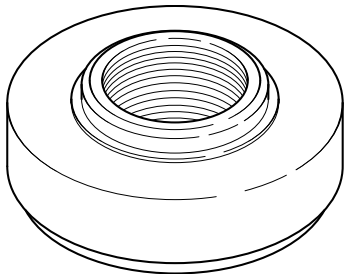
**Valve Seat Grinding Stone
Current Wide Bridge Heads – 30°
Tool No. 494305**

8-1/2 in. Bore	9-3/8 in. Bore
•	•



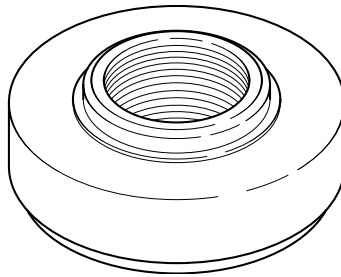
**Valve Seat Grinding Stone
Seat Angle Stone – 20°
Tool No. 494014**

8-1/2 in. Bore	9-3/8 in. Bore
•	•



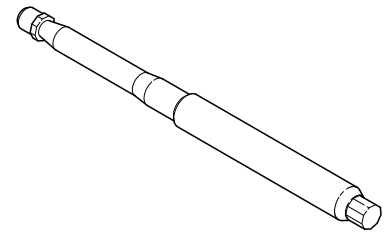
Valve Seat Grinding Stone
Seat Angle Stone – 30°
Tool No. 494280

8-1/2 in. Bore	9-3/8 in. Bore
•	•



Valve Seat Grinding Stone
Seat Angle Stone – 45°
Tool No. 494281

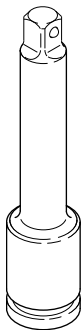
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Pilot
Tool No. 494344

For use with Tool No. 494277 valve seat grinder and Tool No. 494278 dial gauge.

8-1/2 in. Bore	9-3/8 in. Bore
•	•



Extension
Tool No. 494267

7 in. long. 3/4 in. drive. Used for VHP head torquing.

8-1/2 in. Bore	9-3/8 in. Bore
•	•



Socket – 1-5/16 in.
Tool No. 494268

3/4 in. drive - for torquing VHP heads.

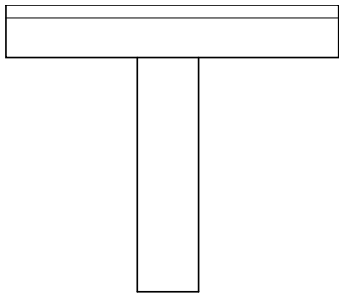
8-1/2 in. Bore	9-3/8 in. Bore
•	•



Socket – 1 in.
Tool No. 494266

3/4 in. drive - for torquing VHP gas heads.

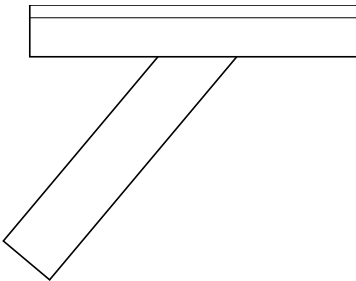
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**VHP Main Bearing
Installation Tool
Tool No. 494364**

6-Cylinder Center Journal
Angle-Drilled Shaft
Brass tool rolls in the main bearings.

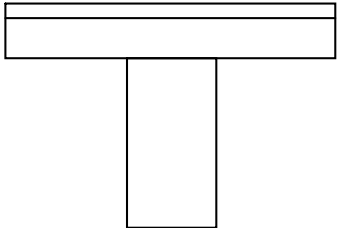
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**VHP Main Bearing
Installation Tool
Tool No. 494365**

Angle-Drilled Shaft
Brass tool rolls in the main bearings.

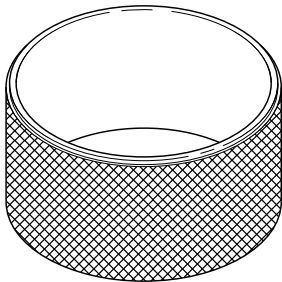
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**VHP Main Bearing
Installation Tool
Tool No. 494366**

Tee-Drilled Crankshaft
Brass tool rolls in the main bearings.

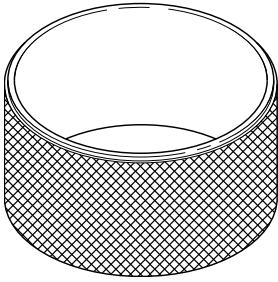
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Ring Compressor
Tool No. 494085**

Sleeve type compressor - taper on inside diameter compresses rings. Inside diameter is less than sleeve preventing ring damage during installation.

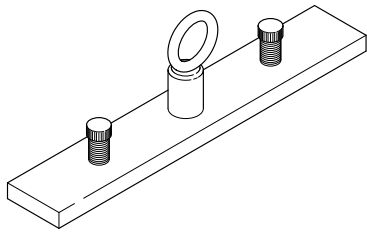
8-1/2 in. Bore	9-3/8 in. Bore
•	



**Ring Compressor
Tool No. 494206**

Sleeve type compressor - taper on inside diameter compresses rings. Inside diameter is less than sleeve preventing ring damage during installation.

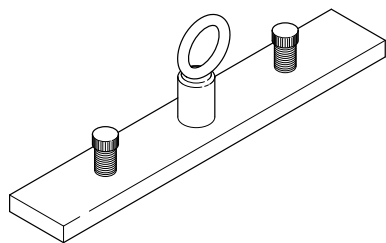
8-1/2 in. Bore	9-3/8 in. Bore
	•



**VHP Gas Piston Puller
Tool No. 474018**

Attaches to the top of VHP gas pistons and aids in the removal of the piston, preventing damage to the cylinder sleeve.

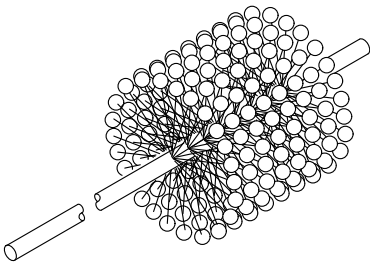
8-1/2 in. Bore	9-3/8 in. Bore
•	



VHP Gas Piston Puller
Tool No. 474019

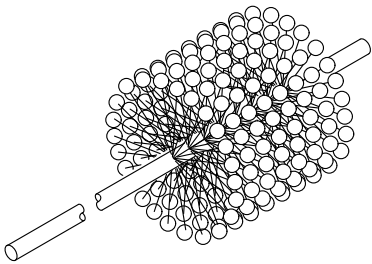
Attaches to the top of VHP gas pistons and aids in the removal of the piston, preventing damage to the cylinder sleeve.

8-1/2 in. Bore	9-3/8 in. Bore
	•



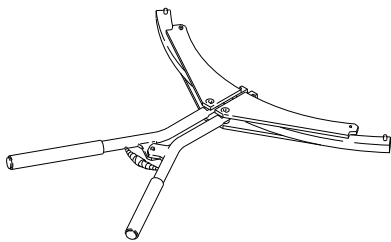
Cylinder Deglazing Hone
Tool No. 494234

8-1/2 in. Bore	9-3/8 in. Bore
	•



Cylinder Deglazing Hone
Tool No. 494236

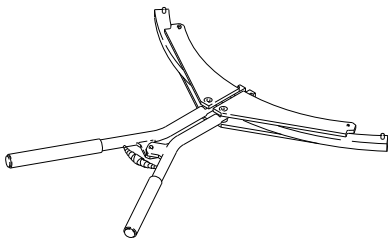
8-1/2 in. Bore	9-3/8 in. Bore
•	



Piston Ring Expander
Tool No. 474041

Prevents twisting and/or over-expanding that can lead to ring damage. For VHP engines with 9-3/8 in. pistons.

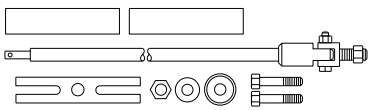
8-1/2 in. Bore	9-3/8 in. Bore
	•



Piston Ring Expander
Tool No. 474042

Prevents twisting and/or over-expanding that can lead to ring damage. For VHP engines with 8-1/2 in. pistons.

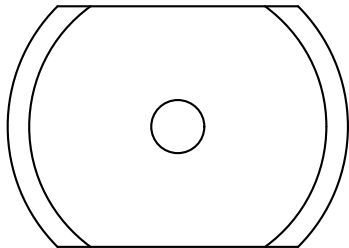
8-1/2 in. Bore	9-3/8 in. Bore
•	



Cylinder Sleeve Removal Kit – Screw Type
Tool No. 499233

Removes the cylinder sleeves from VHP engines. Must be used with bottom plate sized for sleeve.

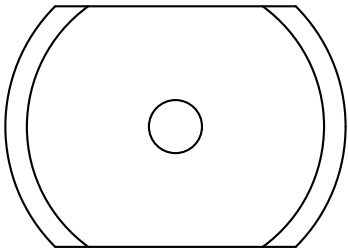
8-1/2 in. Bore	9-3/8 in. Bore
•	•



**Bore Bottom Plate – 8-1/2 in.
Tool No. 494284**

Required for use with Tool No. 499233
cylinder sleeve removal kit.

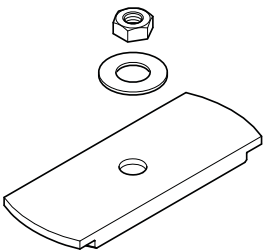
8-1/2 in. Bore	9-3/8 in. Bore
•	



**Bore Bottom Plate – 9-3/8 in.
Tool No. 494286**

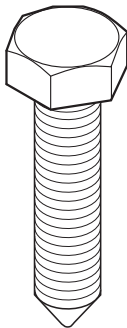
Required for use with Tool No. 499233
cylinder sleeve removal kit.

8-1/2 in. Bore	9-3/8 in. Bore
	•



**Cylinder Sleeve Top Puller Plate –
8-1/2 in.
Tool No. 476073**

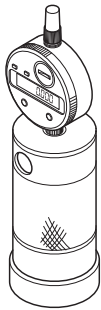
This tool is used with cylinder sleeve
removal kit 499233 and bottom plate
494284 to pull the cylinder sleeve out of
the crankcase.



**Ignition Timing Disc
Adjustment Tool
Tool No. 474022**

This tool is used to accurately locate the
ignition timing disc on CEC-equipped
engines.

8-1/2 in. Bore	9-3/8 in. Bore
•	•

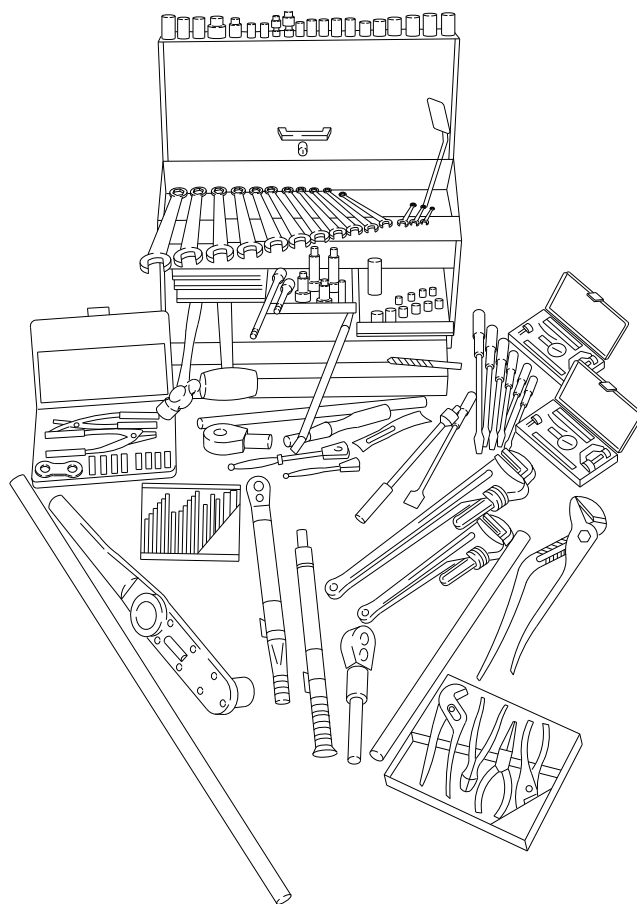


**Valve Recession Gauge
Tool No. 495331**

This tool is used to measure valve reces-
sion on Series Four VHP Engines.

APG 1000/16V150LTD TOOLS

The tools in this section are specific to the APG 1000/16V150LTD engine series.


APG 1000/16V150LTD Hand Tool Kit
Tool No. 472101

Professional-quality hand tools are simply unavailable in many parts of the world.

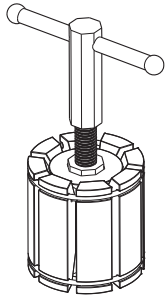
Many APG customers who intend to do their own service and repair want to have the necessary tools on location, but do not desire to invest in more than is necessary.

In response to these needs, Waukesha has developed a kit of specially selected, professional-quality tools necessary for the repair and maintenance of APG series engines.

This kit contains over 150 pieces including a 40 in. wide tool chest:

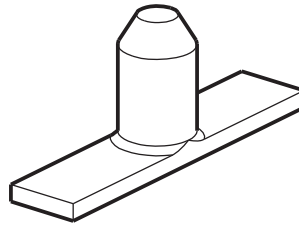
Tools include:

- Torque wrenches to 600 ft-lb
- Metric sockets in 3/8 in., 1/2 in. and 3/4 in. drive
- Ratchets and extensions
- Selected screwdrivers
- Metric wrenches
- Selected punches and chisels
- Selected pipe wrenches
- Selected adjustable wrenches
- Selected pliers
- Selected prybars
- Selected hammers
- Metric tap and dye set



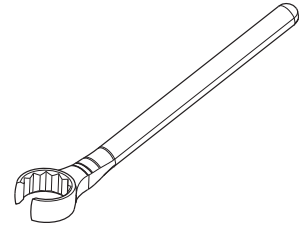
Piston Extraction Tool
Tool No. 472083

This tool expands into the bowl of the piston allowing for the removal and installation of the piston and connecting rod assembly.



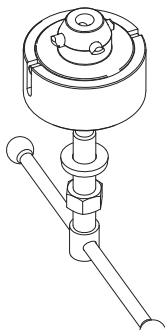
Main Bearing Roll-Out Tool
Tool No. 472087

The tool fits into the oil passage in the crankshaft. The engine is barred over and the bearing removed.



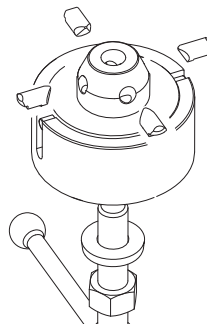
Turbocharger Water Connection Wrench
Tool No. 472082

1-1/2 in.
This tool is used to remove and install the turbocharger water connections.



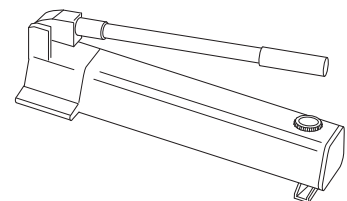
Valve Seat Extraction Tool
Tool No. 472089

Hardened pins fit under the valve seat. The tool forcing nut is turned, pulling the seat from the head.



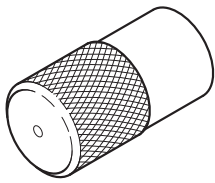
Valve Seat Extraction Tool Replacement Pins
Tool No. 472090

Replacement pins for 472089, Valve Seat Extraction Tool.



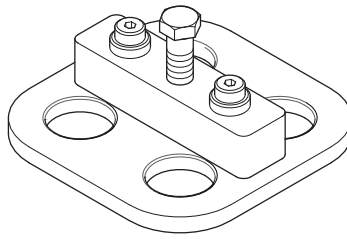
Hydraulic Pump
Tool No. 472088

Supplies the pressure needed to remove and install the vibration damper adapter. Included with the 10,000 psi hydraulic hand pump are a 6 ft hose, gauge, gauge adapter, and a 1/8 in. NPT adapter.



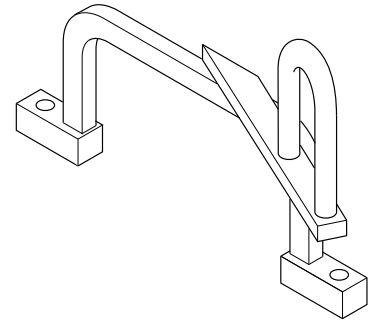
Valve Guide Installation Tool
Tool No. 472093

This tool is used to press valve guides into the heads.



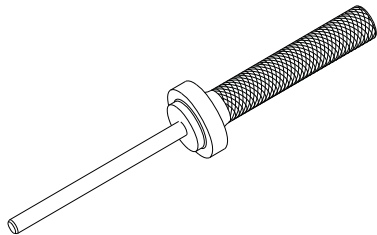
Four Valve Spring Compressor
Tool No. 472096

This tool is used to compress all the valve springs at one time.



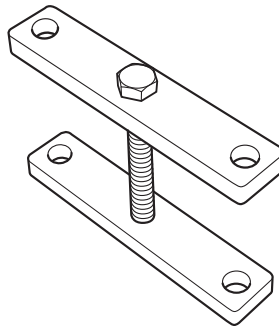
Cylinder Head Lifting Tool
Tool No. 472091

This tool allows for the safe pulling of the cylinder head.



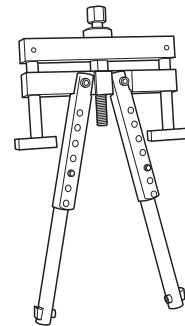
Valve Seat Installation Tool
Tool No. 472092

This tool is used to align the valve seats when they are installed in the head.



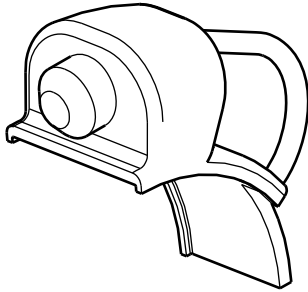
Cylinder Liner Pusher/Clamp
Tool No. 472132

This tool is used for cylinder liner installation and to hold the liner in place while recording liner protrusion.



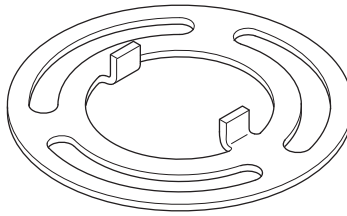
Cylinder Liner Puller
Tool No. 472133

This tool is used to remove cylinder liners.



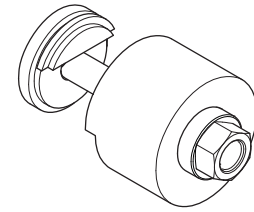
**Connecting Rod Bearing
Alignment Tool**
Tool No. 472081

This tool is used to properly align the bearing when installing the connecting rod.



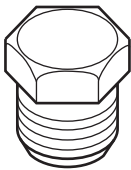
Spark Plug Sleeve Holder
Tool No. 472086A

This tool prevents the spark plug sleeve from loosening when removing spark plugs.



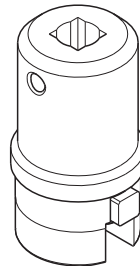
**Connecting Rod Bushing
Removal Tool**
Tool No. 472095

This tool is used to pull out the small end connecting rod bushing during overhaul.



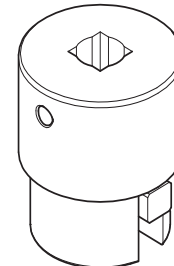
Connecting Rod Guide Pin
Tool No. 472080

This tool prevents scratching of the cylinder sleeve when removing or replacing the connecting rod and piston assembly.



Spark Plug Sleeve Tool
Tool No. 472117

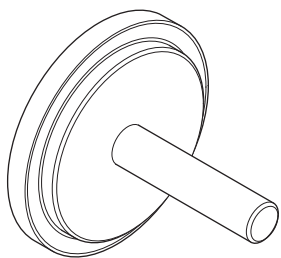
This tool is used to remove and install the spark plug sleeve. This tool is not compatible with VGF engine series.



Recess Tube Tool
Tool No. 472118

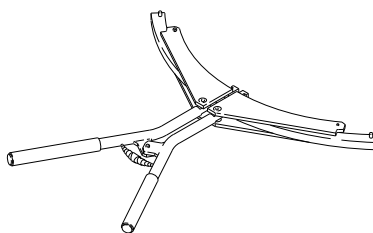
This tool is used to remove and install the rocker cover recess tube.





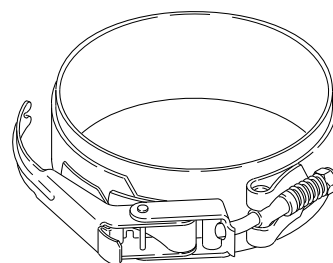
Crankshaft Seal Driver
Tool No. 472103

This tool is used to install both the front and rear crankshaft seals on the APG 1000/16V150LTD engine.



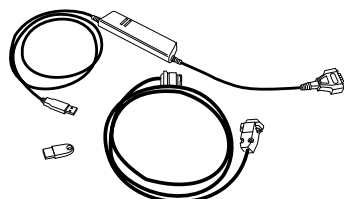
Piston Ring Expander
Tool No. 472075

Prevents twisting and/or over-expanding that can lead to ring damage.



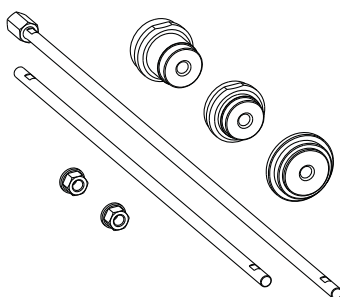
Piston Ring Compressor
Tool No. 472076

Clamp style piston ring compressor.



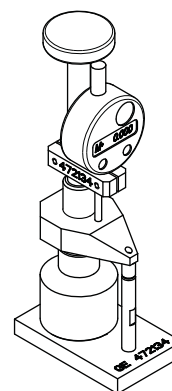
Biogas Diagnostic Tool
Tool No. 495759

This tool is used in conjunction with the GE Waukesha gas engines ESP program to record and graph data necessary for engine performance troubleshooting the APG 1000/16V150LTD biogas engine. See latest edition of *Service Bulletin 15-4011*.



Camshaft Bearing Removal and Installation Kit
Tool No. 472056

Kit includes the required bushings and tensioning rod for the removal and installation of cam bearings in all VGF, and APG1000 engines. Can be used manually or with hydraulic ram 473027.

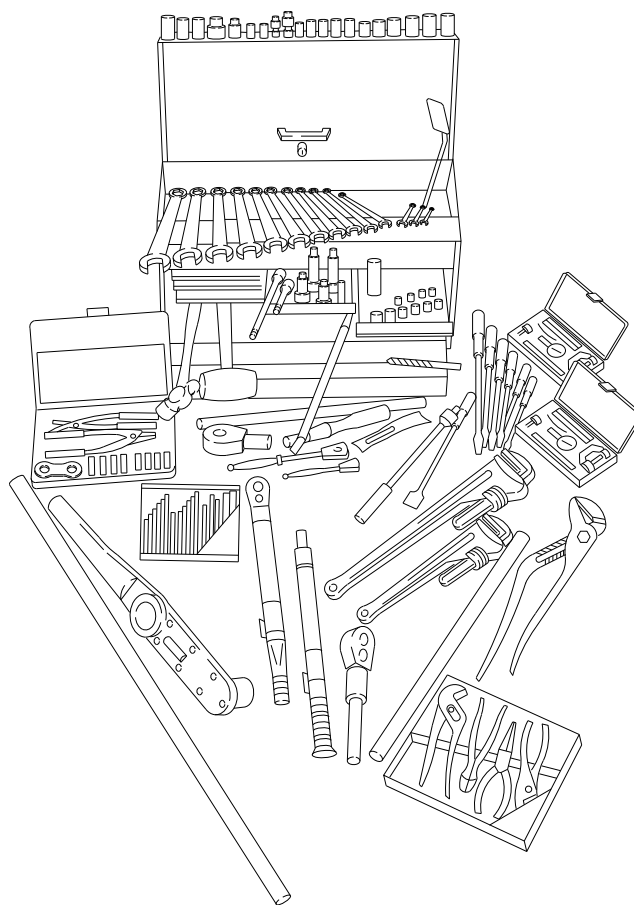


Valve Recession Tool
Tool No. 472134

This tool is used to measure valve recession by making comparative measurements of the valve stem height above the surface surrounding the spark plug sleeve.

APG 2000/3000 TOOLS

The tools in this section are specific to the APG 2000/3000 engine series.


APG 2000/3000 Hand Tool Kit
Tool No. 476075

Professional-quality hand tools are simply unavailable in many parts of the world.

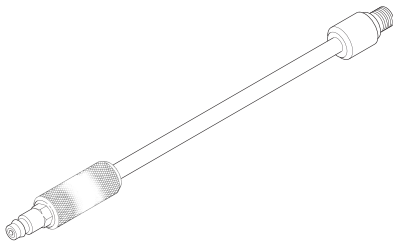
Many APG customers who intend to do their own service and repair want to have the necessary tools on location, but do not desire to invest in more than is necessary.

In response to these needs, Waukesha has developed a kit of specially selected, professional-quality tools necessary for the repair and maintenance of APG series engines.

This kit contains 128 pieces including a 40 in. wide tool chest:

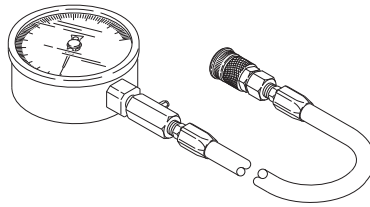
Tools include:

- Torque wrenches to 800 N·m
- Metric sockets in 3/8 in., 1/2 in. and 3/4 in. drive
- Ratchets and extensions
- Selected screwdrivers
- Metric wrenches
- Selected punches and chisels
- Selected pipe wrenches
- Selected adjustable wrenches
- Selected pliers
- Selected prybars
- Selected hammers



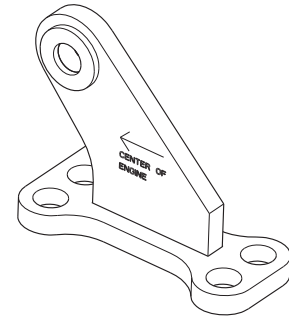
Compression Tester Adapter
Tool No. 495403

Flexible hose adapter for use with 495402 gauge.



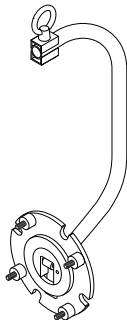
Compression Tester
Tool No. 495402

Dial registers from 0 – 500 psi. Adapter 495403 is required for use.



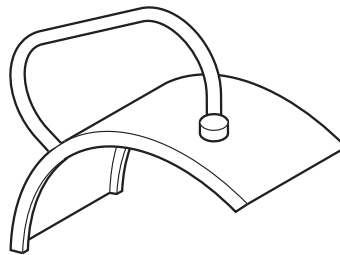
Engine Lifting Bracket Kit
Tool No. 476083

The devices connect to the top of the cylinder head studs allowing for the connection of the spreader beam part number 476081. This combination is used when lifting the engine. This kit contains four (4) lifting brackets (325290) and sixteen (16) connecting nuts.



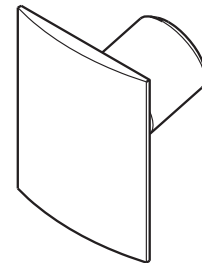
Damper Lifting Device
Tool No. 476011

This device fits around the damper allowing for the attachment of the hoist. This tool will only work with the charge air cooler removed.



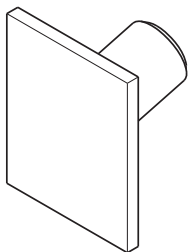
Connecting Rod Bearing Installation Tool
Tool No. 476000

This tool is used to properly align the bearing when installing the connecting rod.



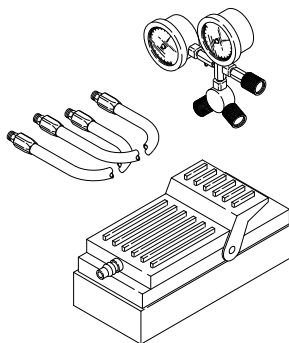
Upper Serration Cushion
Tool No. 476001

This tool protects the liner from damage when the piston and rod are removed or installed in the cylinder.



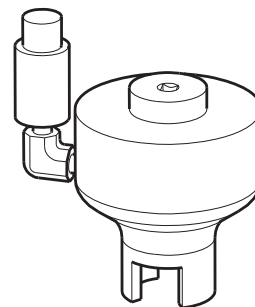
Lower Serration Cushion
Tool No. 476070

This tool protects the crankshaft connecting rod journal from damage when the piston and connecting rod are installed in the liner.



Hydraulic Pump Kit
Tool No. A292539

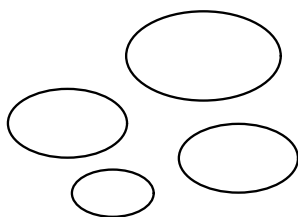
This pump contains a pneumatic foot-operated hydraulic pump, pressure gauges, supply air oiler, pressure regulator and hydraulic hoses.



Connecting Rod Hydraulic Jacks
Tool No. 476002

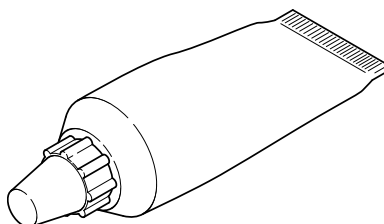
These two (2) hydraulic jacks are used to stretch the connecting rod studs when removing and installing the connecting rod.

Replacement Gauge
Tool No. 473036



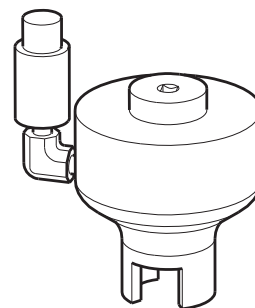
Seal Kit for 476002
Connecting Rod Jacks
Tool No. 476004

This kit contains all the hydraulic seals needed to rebuild one 476002 or 476002A connecting rod jack.



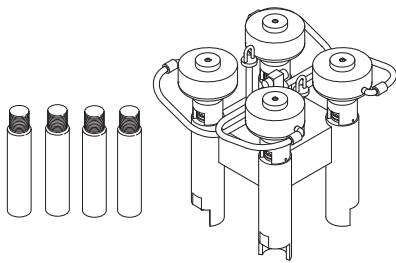
OraSeal
Tool No. 495407

Non-hardening sealant for sealing cylinder sleeve to block.



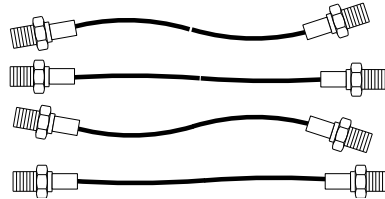
Single Connecting Rod
Replacement Jack
Tool No. 476002A





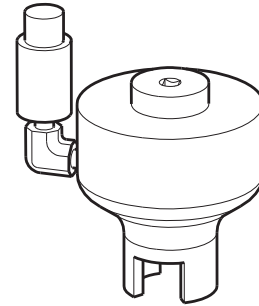
**Hydraulic Cylinder Head Jack
(Fixture/Stud Extensions/Hydraulic Jacks with Manifold)
Tool No. 476003**

These four (4) hydraulic jacks are used to stretch the cylinder head studs during the removal and installation of the cylinder head. Includes Tool 494497 Tommy Bar.



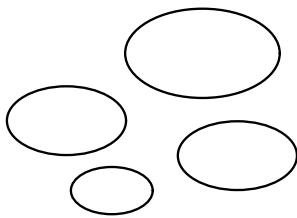
**Replacement Hoses
Tool No. 473015**

Four (4) replacement hoses for cylinder head hydraulic mounting fixture 476003.



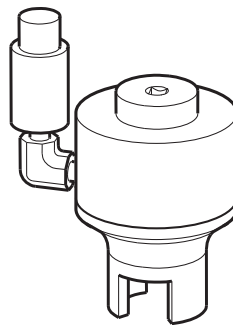
**Single Cylinder Head/Main
Bearing Replacement Jack
Tool No. 476003A**

In addition to the cylinder head, these jacks are used as the primary main bearing jacks for removal and installation of the intermediate main bearings. This tool will not work on the end main bearings when the oil pan and end caps are mounted (see 476077).



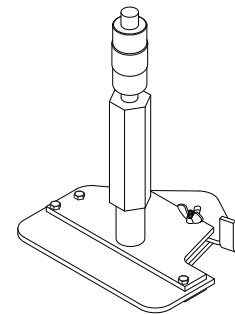
**Seal Kit for 476003A Cylinder Head
Main Bearing Jacks
Tool No. 472995**

This kit contains all the hydraulic seals needed to rebuild one 476003 or 476003A cylinder head/main bearing jack.



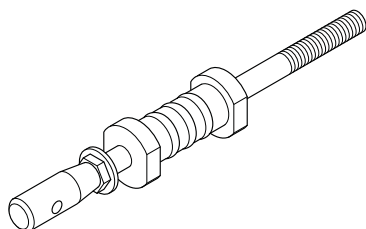
**Single Cylinder Head/Main
Bearing Replacement Jack
Tool No. 476077**

These jacks are used to remove and install the outermost main bearing caps when the free end cover and the oil pan are mounted to the engine. The entire jack will need to be rotated when they are installed on the main bearing studs.



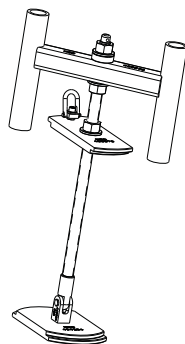
**Anti-Polishing Ring Removal Tool
Tool No. 476006**

This device fits into slots in the anti-polishing ring allowing for the easy removal of the ring from the liner. Uses 476084 slide hammer.



Slide Hammer
Tool No. 476084

For use with Anti-Polishing Ring Removal tool 476006.



Cylinder Sleeve Installation Kit
Tool No. 495576

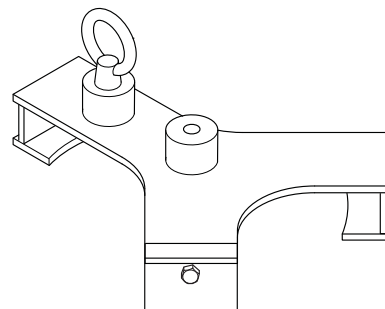
Puller kit includes:

495577 Screw

495578 Yolk

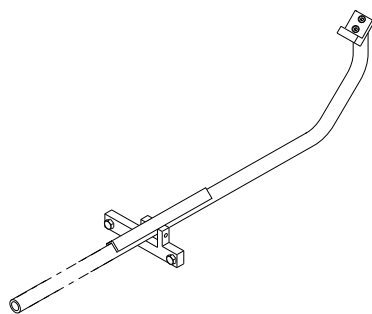
495579 Top Plate

494284 Bottom Plate



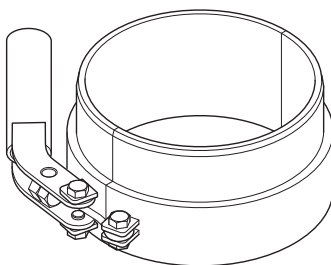
Connecting Rod and Piston Lifting Device
Tool No. 476010

This tool fits into the top ring groove and allows for the removal of the piston and connecting rod after they have been pushed up in the bore by Tool No. 476014.



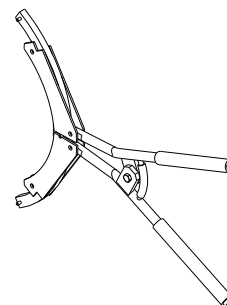
Connecting Rod Installation Tool
Tool No. 476014

This device pivots on the crankcase door opening, pushing on the bottom of the connecting rod lifting the piston on rod assembly upwards in the liner.



Piston Ring Compressor
Tool No. 476067

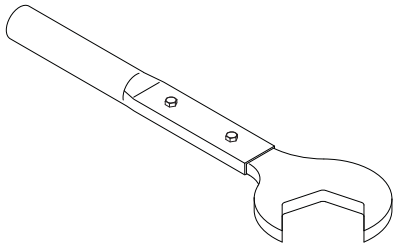
This ring compressor fits into the anti-polishing ring recess in the cylinder sleeve allowing easy installation of the piston.



Piston Ring Expander
Tool No. 476016

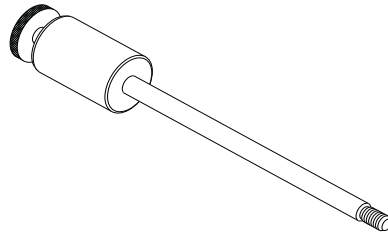
Prevents twisting and/or over-expanding that can lead to ring damage.





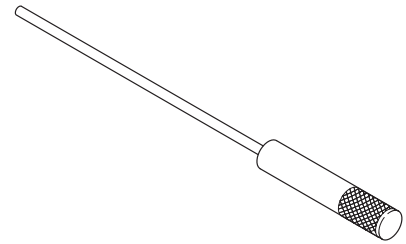
Wrench for Preheating Resistor
Tool No. 476007

This tool allows for the easy removal and installation of the coolant preheater elements.



Prechamber Removal Tool
Tool No. 476008

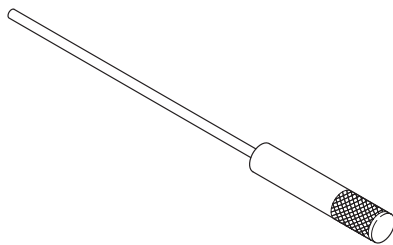
This tool is used to pull the prechamber from the head. This must be done prior to borescoping the head or during cylinder head overhaul. Uses 476084 slide hammer.



Prechamber Non-Return Valve Removal Tool
Tool No. 476068

This tool is sized to remove the non-return valve from the part number 3342408, AA325146 and AA325147A prechamber assembly in the cylinder head.

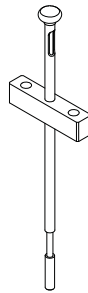
NOTE: Consult the engine specification package/engine bill of material to determine the proper prechamber assembly and components.



Prechamber Non-Return Valve Removal Tool
Tool No. 476069

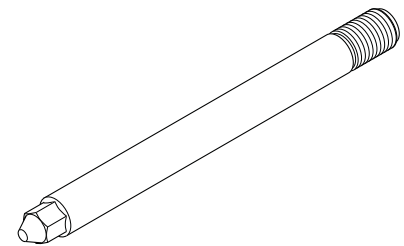
This tool is sized to remove the non-return valve from the part number 3342690 prechamber assembly in the cylinder head.

NOTE: Consult the engine specification package/engine bill of material to determine the proper prechamber assembly and components.



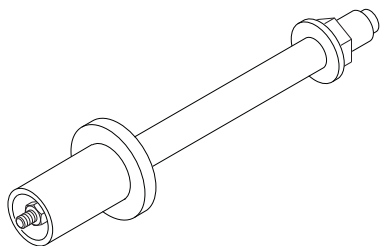
TDC Checking Gauge
Tool No. 476009

This tool fits into the prechamber hole and indicates when the piston has reached top dead center. This is useful when adjusting valves.



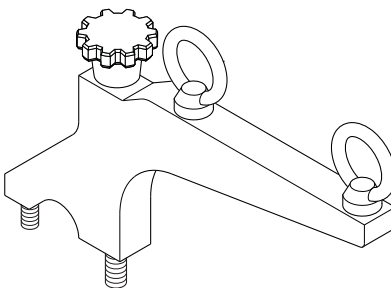
Damper Removal Stud
Tool No. 476012

The tool is placed into the front of the crankshaft allowing the damper to slide off the crankshaft so the lifting device can be used.



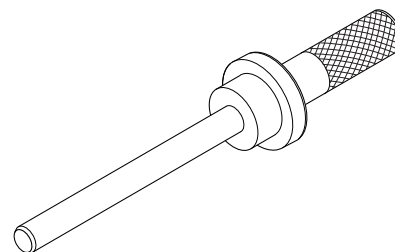
Flywheel Pin Extraction Tool
Tool No. 476018

This tool is used to pull the alignment pins from the crankshaft before the flywheel is removed.



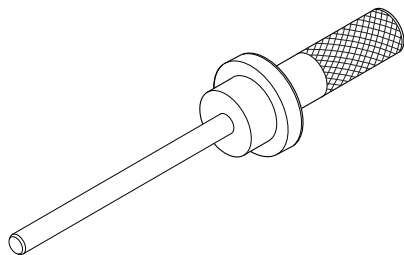
Cylinder Head Lifting Device
Tool No. 476013

This tool mounts to the cylinder head and establishes the correct angle for the safe and easy removal of the head.



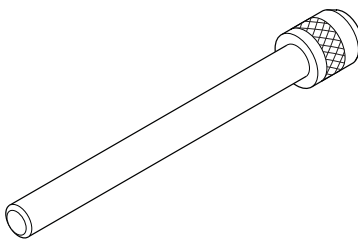
Valve Seat Installation Tool – Without Guide
Tool No. 476026

This tool is used to insert the valve seats into the head without the valve guides being in place.



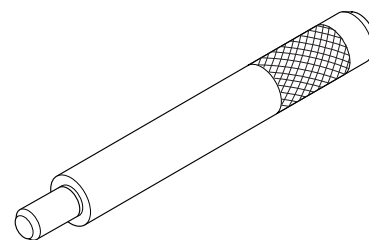
Valve Seat Installation Tool – With Guide
Tool No. 476027

This tool inserts the valve seats in the head using the valve guides for alignment.



Valve Guide Installation Tool
Tool No. 476028

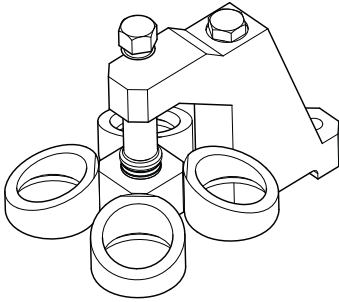
The tool is used to press the valve guides accurately into the head.



Valve Guide Removal Tool
Tool No. 476029

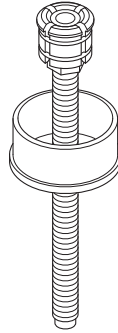
This tool is used to press out the valve guides.





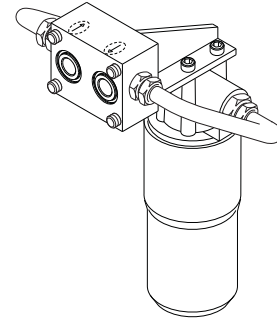
**Valve Spring Compressor
Tool No. 476030**

This tool compresses the valve springs for the installation and removal of the intake and exhaust valves.



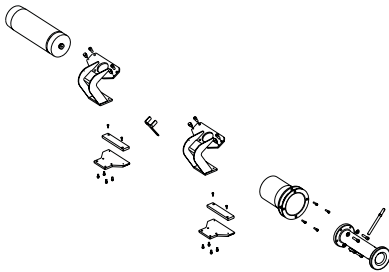
**Intake and Exhaust Valve Seat
Puller
Tool No. 476031**

This tool is used along with a hydraulic ram to pull the intake and exhaust valve seats from the head.



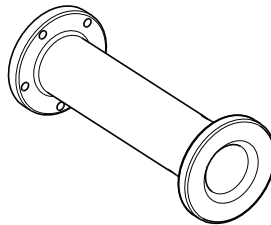
**Filter Before Turbocharger,
Assembly
Tool No. 476017**

This start-up tool is only used during the first 2 – 3 hours of engine operation after an overhaul to prevent dirt from entering the turbocharger through the oil lines.



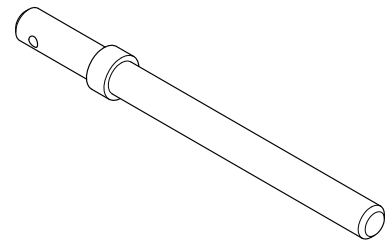
**Camshaft Mounting Device
Tool No. 476021**

This tool aids in the proper support and alignment of the camshaft when it is being installed in the engine. Individual parts are offered for replacement. See the following part numbers: 476035 through 476043.



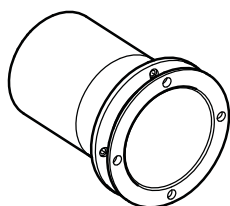
**Extension Tube, Camshaft
Mounting Device
Tool No. 476035**

See Tool 476021.



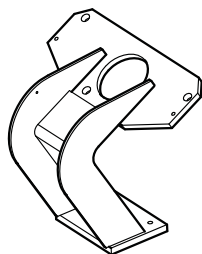
**Driver, Camshaft Mounting Device
Tool No. 476036**

See Tool 476021.



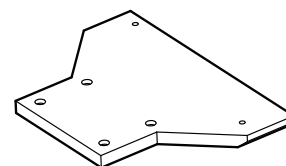
Guide, Camshaft Mounting Device
Tool No. 476037

See Tool 476021.



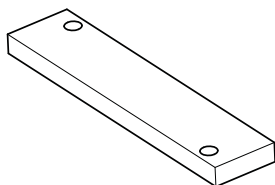
Support, Camshaft Mounting Device
Tool No. 476038

See Tool 476021.



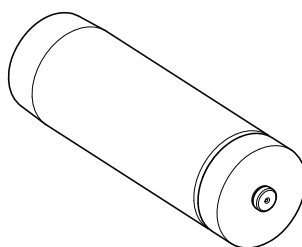
Plate, Camshaft Mounting Device
Tool No. 476039

See Tool 476021.



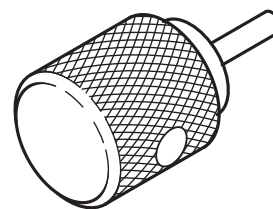
Nylon Plate, Camshaft Mounting Device
Tool No. 476040

See Tool 476021.



Head Guide, Camshaft Mounting Device
Tool No. 476041

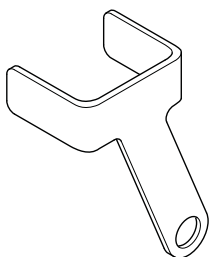
See Tool 476021.



Center Guide, Camshaft Mounting Device
Tool No. 476042

See Tool 476021.

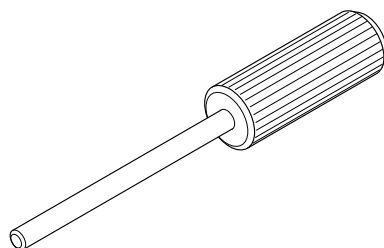




Stopper, Camshaft Mounting Device

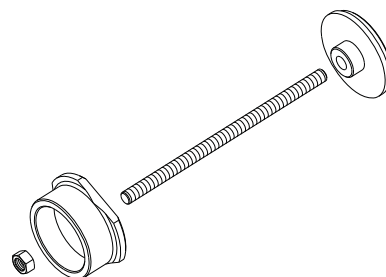
Tool No. 476043

See Tool 476021.



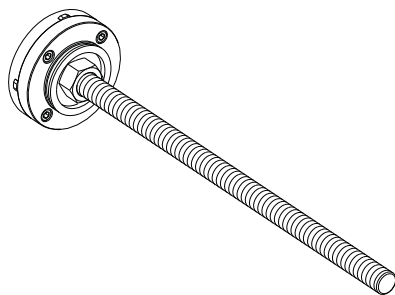
Camshaft Bushing Position Tool
Tool No. 476078

This tool is used to locate the camshaft bushings precisely in the engine block.



Camshaft Bushing Extractor
Tool No. 476079

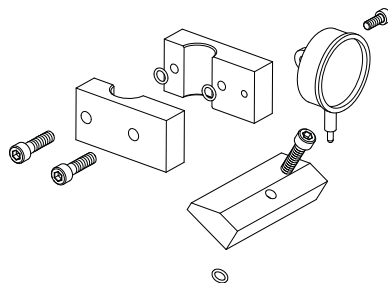
This tool is used to remove the camshaft bushings from the engine block without damaging the block.



Idler Gear Inner Bushing Extractor

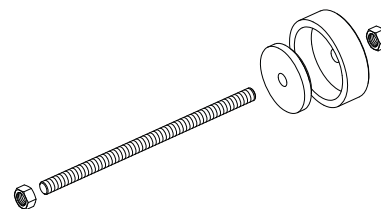
Tool No. 476022

This tool is used to extract the inner bushing on the idler gear.



Camshaft Timing Device
Tool No. 476023

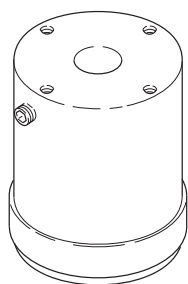
This device consists of a clamp that fits around the push rods and a dial indicator. It allows you to see exactly when the push rods start to move, allowing for precise cam adjustment.



Idler Gear Outer Bushing Extractor

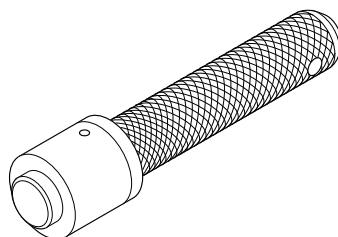
Tool No. 476024

This tool is used to extract the outer bushing from the idler gear.



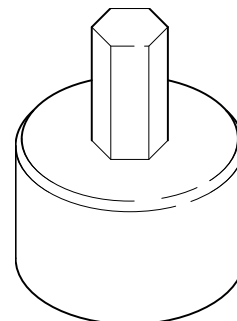
Hydraulic Ram – 20 Ton
Tool No. 473027

This tool is used with 476031, Intake and Exhaust Valve Seat Puller.



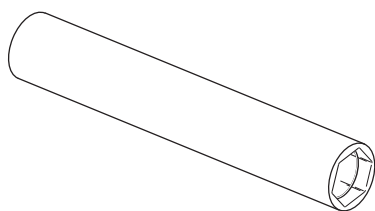
Water Connection Installation Tool
Tool No. 476034

This tool is used to install the seals on the water connection without damaging them.



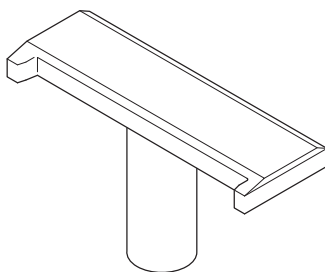
M36 Stud Driver
Tool No. 476071

This tool installs the cylinder head and main bearing studs.



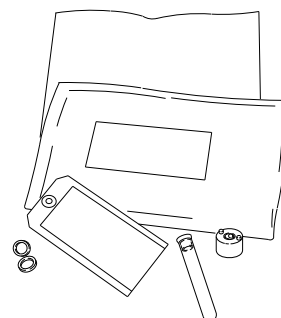
Spark Plug Wrench
Tool No. 476072

This wrench is sized to properly remove and install the spark plugs in the 220 engine.



Main Bearing Removal and Installation Tool
Tool No. 476074

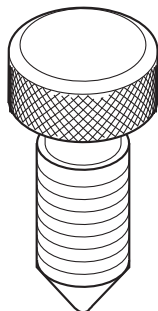
This tool turns the main bearing shells in and out of the engine.



Damper Fluid Testing Kit
Tool No. 476076

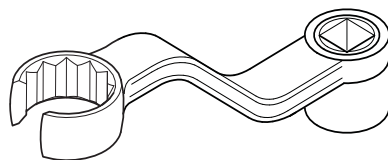
This kit is used to take fluid samples from the 12V220GL engines vibration dampener. Includes sample container, instructions and engine information tag.





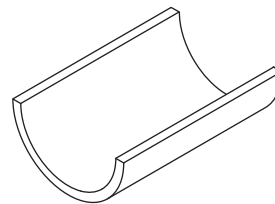
**Ignition Timing Disc
Adjustment Tool
Tool No. 476005**

This tool is used to accurately locate the ignition timing disc position.



**Thermocouple Removal Wrench
Tool No. 476080**

This tool is used to remove thermocouples.

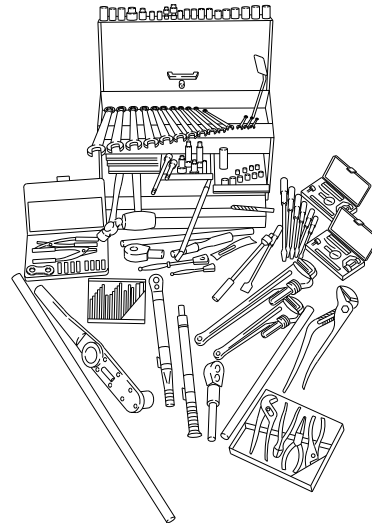


**Rod Journal Protector
Tool 495557**

This tool is used to protect the surface of the crankshaft during connecting rod removal and installation.

VGF TOOLS

The VGF series engine tools will vary between inline and vee types as well as by fuel usage.

**VGF Hand Tool Kit
Tool No. 472078**

Professional-quality hand tools are simply unavailable in many parts of the world.

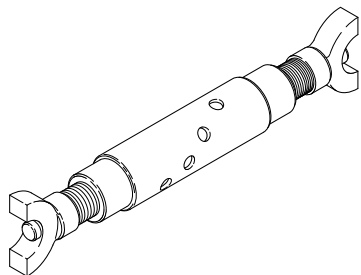
Many VGF customers who intend to do their own service and repair want to have the necessary tools on location, but do not desire to invest in more than is necessary.

In response to these needs, Waukesha has developed a kit of specially selected, professional-quality tools necessary for the repair and maintenance of VGF series engines.

This kit contains over 150 pieces including a 40 in. wide tool chest:

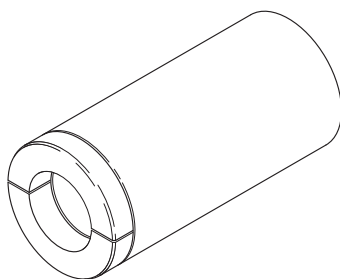
Tools include:

- Torque wrenches to 600 ft-lb
- Metric sockets in 3/8 in., 1/2 in. and 3/4 in. drive
- Ratchets and extensions
- Selected screwdrivers
- Metric wrenches
- Selected punches and chisels
- Selected pipe wrenches
- Selected adjustable wrenches
- Selected pliers
- Selected prybars
- Selected hammers
- Metric tap and dye set



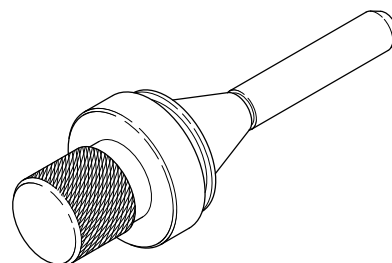
Crankcase Spreader
Tool No. 472002

Manually operated, threaded screw type spreader relieves tension on main bearing caps.



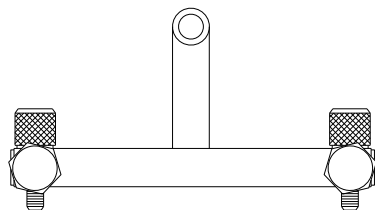
Valve Seal Tool
Tool No. 472077

Valve seal tool is required for installing "barbed" seals.



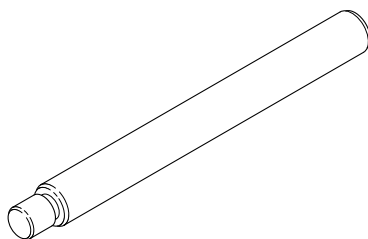
Valve Seat Driver
Tool No. 472004

For valve seat installation only. Pilots in guide. For use with cylinder head valve seats as well as valve seats in vee engine wastegates.



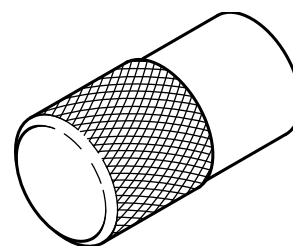
Piston Puller
Tool No. 472007

Puller has two screws which thread into the piston crown. Includes handle for removing piston and 6 mm tap for chasing the threads in the top of the piston.



Valve Guide Extractor
Tool No. 472008

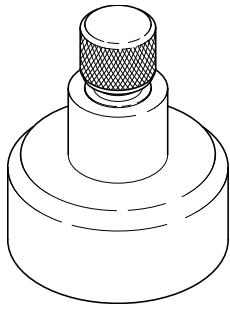
Driver for removing valve guides.



Valve Guide Driver
Tool No. 472009

Driver for installing valve guides.

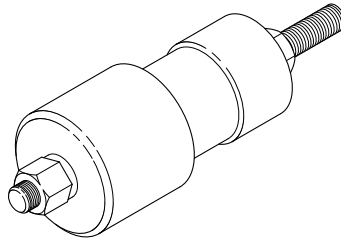




Valve Seat Extractor
Tool No. 472010

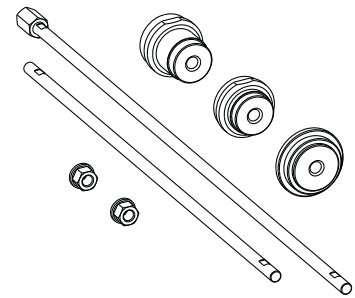
Four hardened jaws extend outward, under insert to lift it from its bore. Tool may be driven with impact wrench. For cylinder head as well as for vee engine waste-gate valves.

Replacement pins set: P/N 472064.



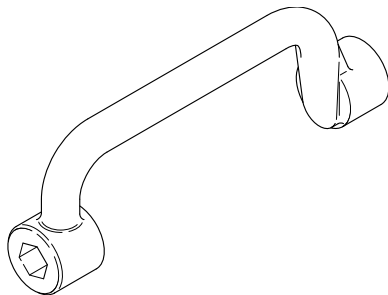
Connecting Rod Bushing Press
Tool No. 472012

Installs and removes upper (small end) connecting rod bushing.



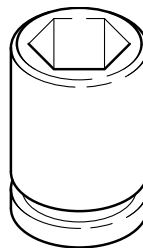
Camshaft Bearing Removal and Installation Kit
Tool No. 472056

Kit includes the required bushings and tensioning rod for the removal and installation of cam bearings in all VGF, and APG1000 engines. Can be used manually or with hydraulic ram 473027.



Rocker Arm Stand / Manifold Nut Wrench
Tool No. 472015

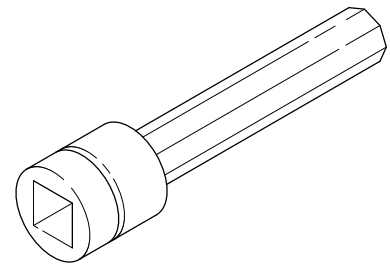
Offset wrench torques the rocker arm stands. Also fits the nuts at the water manifold flanges on inline engines with water-cooled exhaust manifolds.



Lower Spark Plug Tube Socket
Tool No. 472017

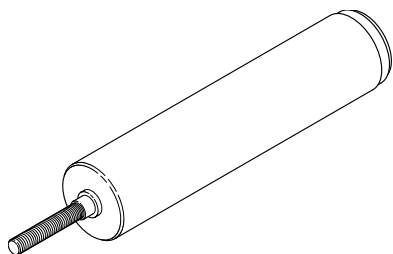
Special thin wall, 3/4 in. drive, 41 mm socket for lower spark plug tube (P/N 305003D, in head) with hex (tube previously used only in cylinder head series P/N AA300102D, AD300102D).

Recommended for older VGF engines. See latest edition of *Service Bulletin* 7-2551.



Damper Flange Socket
Tool No. 472023

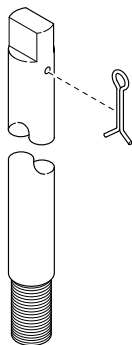
Hardened, long, hex-head (10 mm), 3/8 in. drive socket wrench for vibration damper driving flange.



Camshaft Pilot
Tool No. 472024

Pilot threads onto rear end of camshaft for camshaft installation and removal on Vee engines.

Extends rear cam journal spanning two bearings in the block to provide full support for rear end of the cam.



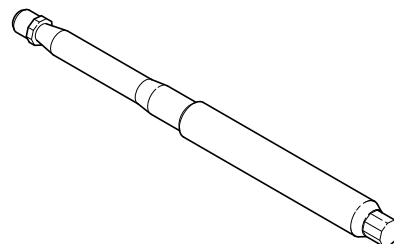
Guide Pin Kit
Tool No. 472030

Includes disassembly and assembly guide pins for:

Vibration Damper (2)

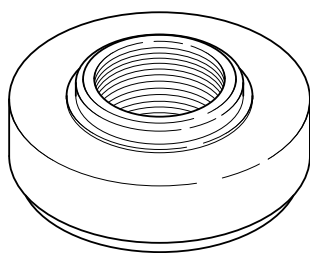
Flywheel Housing (4)

Flywheel (4)



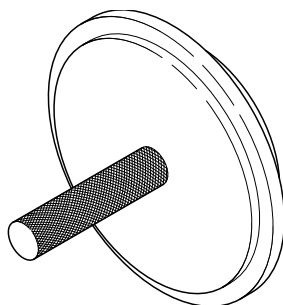
Valve Guide Pilot
Tool No. 472035

Intake/exhaust valve guide pilot for use with valve grinder P/N 494277.



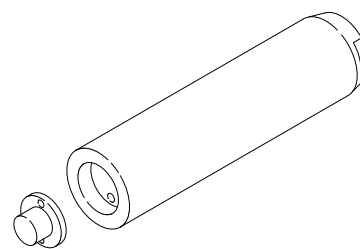
Valve Seat Grinding Wheels
Tool No. 472044

A 20° stone for use with P/N 494277 grinder and pilot P/N 472035, to cut 20° intake and exhaust inserts.



VGF Crankshaft Seal Driver
Tool No. 472048

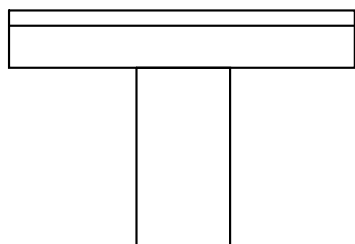
Hard plastic seal driver with a steel handle shaped to install the front and rear VGF crankshaft seals.



Camshaft Pilot Tool
Tool No. 472055

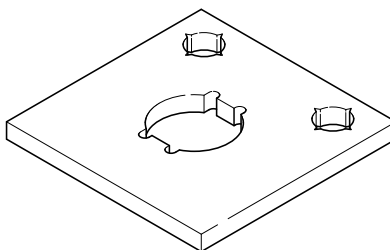
Guides the camshaft through the bushings in crankcase on in-line engines.





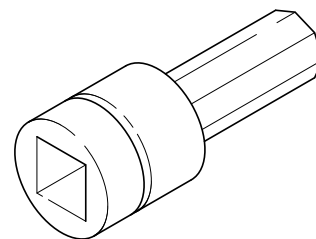
Main Bearing Roll-Out Tool
Tool No. 472057

"T" shaped brass tool located in crankshaft oil hole to roll upper bearing shell out of crankcase for inspection and/or replacement.



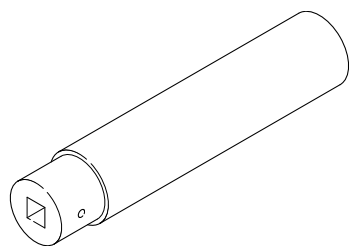
Spark Plug Carrier Holder
Tool No. 472065

This tool prevents spark plug carriers from loosening due to the break-away torque when removing spark plugs.



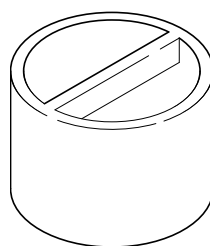
Damper Flange Socket
Tool No. 472066

14 mm hex drive socket (1/2 in. drive) to assemble vibration damper driving flange to crankshaft.



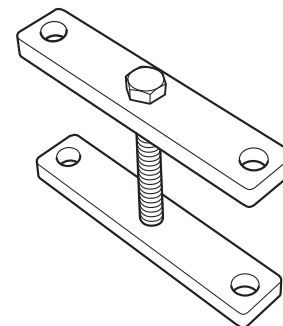
Water Pump Jam Nut Socket
Tool No. 472067

Spanner wrench to torque the center jam nut on inline VGF jacket water pumps (P/N E301060B, D301060B)



Spark Plug Tube Removal Tool
Tool No. 472068

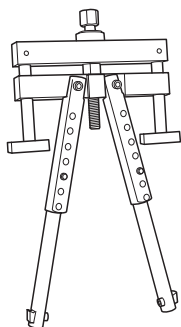
Combination tool, 3/4 in. drive, to remove both the current (P/N 305002E) and previous (P/N 305002D) upper spark plug tubes, and also current (P/N 305003J) and previous (P/N 305003F) lower spark plug tubes.



Cylinder Liner Pusher/Clamp
Tool No. 472132

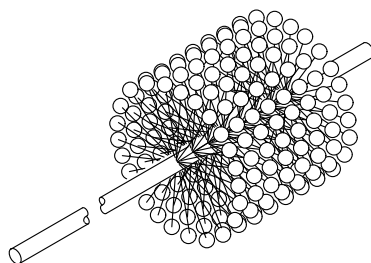
This tool is used for cylinder liner installation and to hold the liner in place while recording liner protrusion.





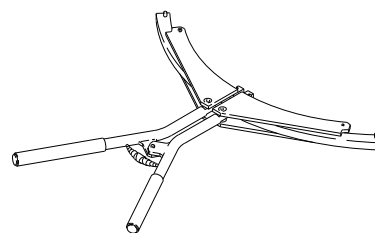
Cylinder Liner Puller
Tool No. 472133

This tool is used to remove cylinder liners.



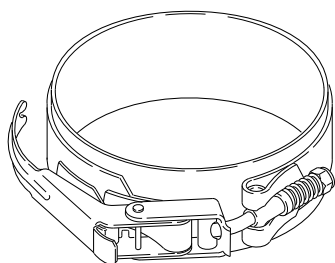
Flexible Cylinder Hone
Tool No. 494245

For breaking the glaze when re-ringing an engine on which the cylinders are not worn.



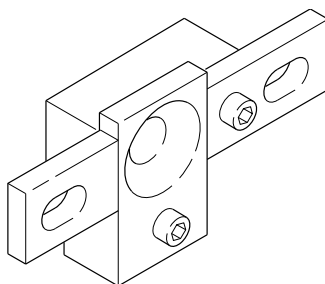
Piston Ring Expander
Tool No. 472075

Prevents twisting and/or over-expanding that can lead to ring damage.



Piston Ring Compressor
Tool No. 472076

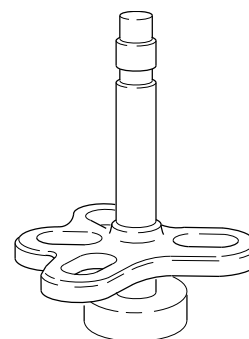
Clamp style piston ring compressor.



Vee DSM Sensor Tool
Tool No. 472070

This tool kit includes special tools to drill and tap previous production (prior to April 1997) VGF vee crankcases to accept DSM sensors.

For specific procedures, see latest edition of *Form 6278, Custom Engine Control Detonation Sensing Module Installation, Operation & Maintenance Manual*.

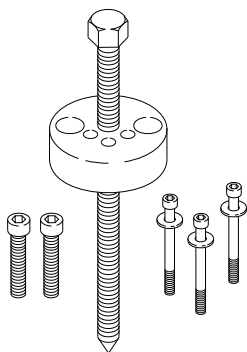


Rocker Arm Cover Removal Tool
Tool No. 472074

For new valve covers using flange-mounted coils. This tool consists of a puller set with a disc sized to fit on the spark plug access tube.

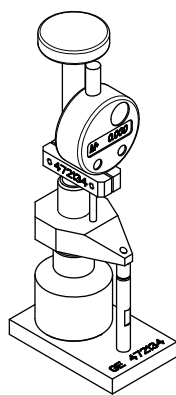
See latest edition of *Service Bulletin 11-2782*.





Water Pump Impeller Puller Tool
Tool No. 472071

This tool is used for pulling the water pump impeller and the vibration damper adapter.



Valve Recession Tool
Tool No. 472134

This tool is used to measure valve recession by making comparative measurements of the valve stem height above the surface surrounding the spark plug sleeve.



INTERMEDIATE SERIES TOOLS

The tools in this section are specific to the following engine models:

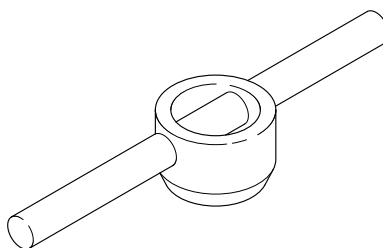
H2476G

F1905G

F817G

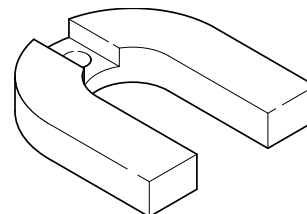
L3712G

F1197G



**Valve Guide Reamer T-Handle
Tool No. 474012**

Use with 494339 valve guide reamer.



**Lifter Guide Alignment Tool
Tool No. 494203**

Properly positions the lifter guides.

F817G F1197G F1905G H2476G L3712G

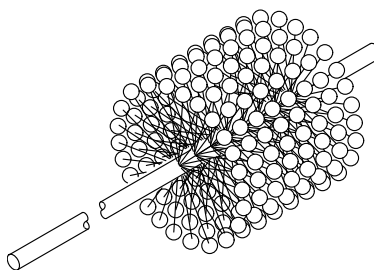


F817G F1197G F1905G H2476G L3712G



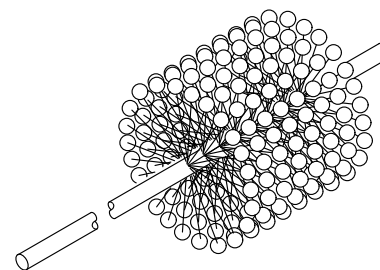
**Compression Tester
Adapter (14 mm)
Tool No. 494216**

Flexible (hose) adapter for use with 494215 gauge. Fits F817, VRG265, VRD310, F265GA, VRG220/330.



**Flexible Cylinder Hone
Tool No. 494237**

Approved for "breaking the glaze" when re-ringing an engine where cylinders are not worn.



**Flexible Cylinder Hone
Tool No. 494238**

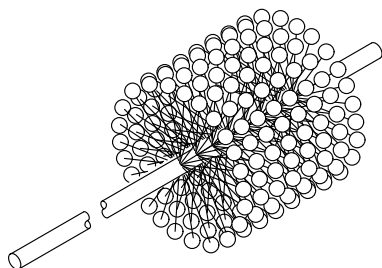
Approved for "breaking the glaze" when re-ringing an engine where cylinders are not worn.

F817G F1197G F1905G H2476G L3712G



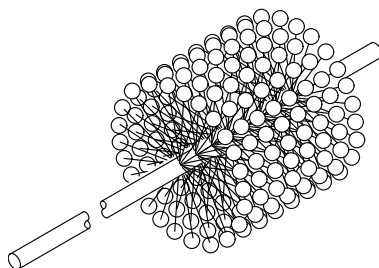
F817G F1197G F1905G H2476G L3712G





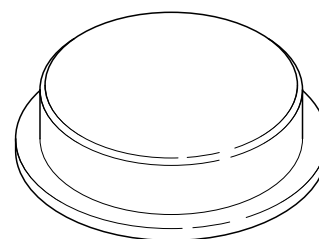
Flexible Cylinder Hone
Tool No. 494239

Approved for "breaking the glaze" when re-ringing an engine where cylinders are not worn.



Flexible Cylinder Hone
Tool No. 494240

Approved for "breaking the glaze" when re-ringing an engine where cylinders are not worn.



Teflon Packing Ring Installation Tools
Tool No. 494260C

One tool replaces both the pusher and the resizer.

The use of this tool makes installing the packing rings easier and faster and reduces the chance of damage.

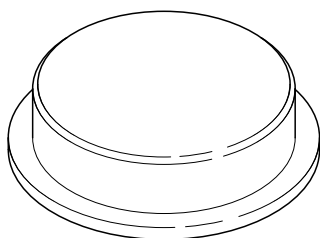
F817G F1197G F1905G H2476G L3712G



F817G F1197G F1905G H2476G L3712G



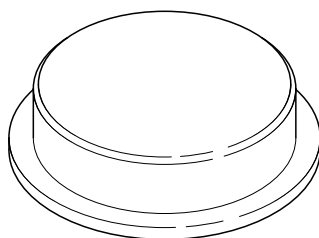
F817G F1197G F1905G H2476G L3712G



Teflon Packing Ring Installation Tools
Tool No. 494260D

One tool replaces both the pusher and the resizer.

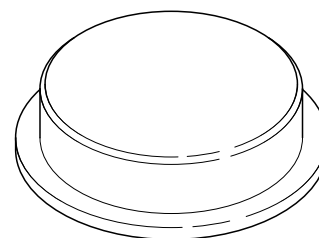
The use of this tool makes installing the packing rings easier and faster and reduces the chance of damage.



Teflon Packing Ring Installation Tools
Tool No. 494260H

One tool replaces both the pusher and the resizer.

The use of this tool makes installing the packing rings easier and faster and reduces the chance of damage.



Teflon Packing Ring Installation Tools
Tool No. 494260F

One tool replaces both the pusher and the resizer.

The use of this tool makes installing the packing rings easier and faster and reduces the chance of damage.

F817G F1197G F1905G H2476G L3712G

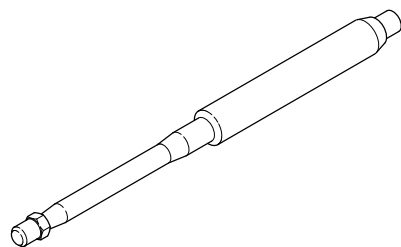


F817G F1197G F1905G H2476G L3712G



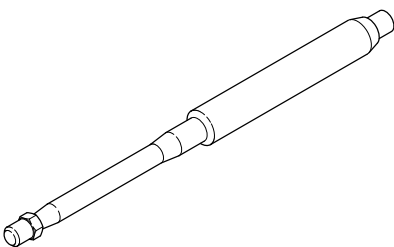
F817G F1197G F1905G H2476G L3712G





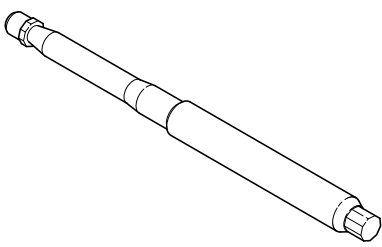
Valve Guide Pilot
Tool No. 494300

0.5 in. diameter
For use with Tool No. 494277 valve seat grinder and Tool No. 494278 dial gauge.



Valve Guide Pilot
Tool No. 494301

0.625 in. diameter
For use with Tool No. 494277 valve seat grinder and Tool No. 494278 dial gauge.



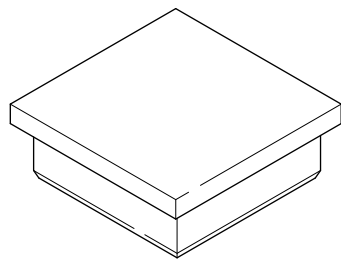
Valve Guide Pilot
Tool No. 494344

0.564 in. diameter
For use with Tool No. 494277 valve seat grinder and Tool No. 494278 dial gauge.

F817G F1197G F1905G H2476G L3712G
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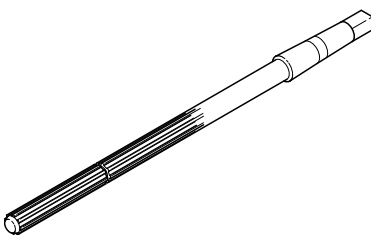
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F817G F1197G F1905G H2476G L3712G
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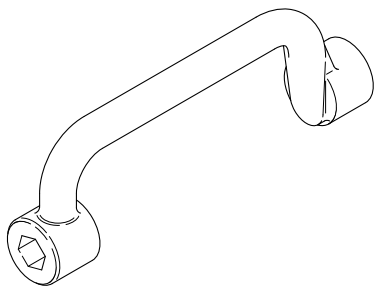


Loading Mandrel
Tool No. 494322

Used when installing Teflon packing rings.



Valve Guide Reamer
Tool No. 494339



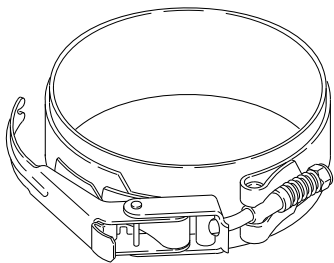
Cylinder Head Nut Wrench
Tool No. 499723

Allows mechanics to torque heads without removing water manifold.

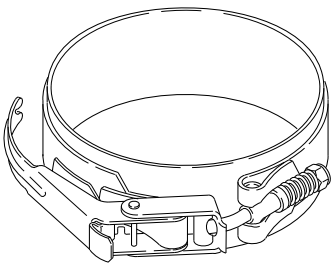
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F817G F1197G F1905G H2476G L3712G
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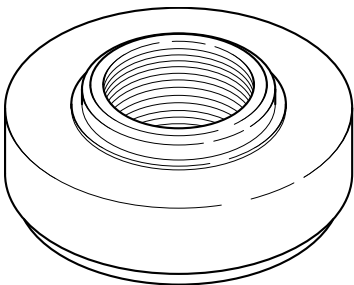
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Expandable Piston Ring Compressor
Tool No. 499967
3-1/8 to 7 in. range.

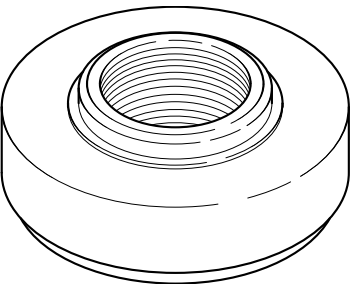


Expandable Piston Ring Compressor
Tool No. 494375
6 in. to 9 in. range.

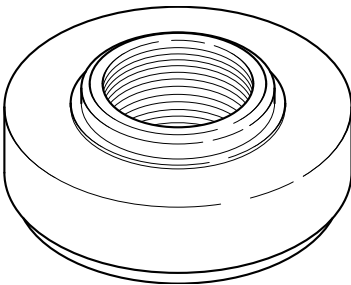


Valve Seat Grinding Stone
Tool No. 494302
Designed to be used with the Hall Toledo Grinder, P/N 494277.
Angle: 15° int.
Diameter: 2.75 in.

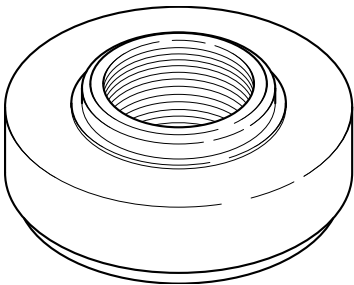
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Valve Seat Grinding Stone
Tool No. 494303
Designed to be used with the Hall Toledo Grinder, P/N 494277.
Angle: 45°
Diameter: 2.75 in.

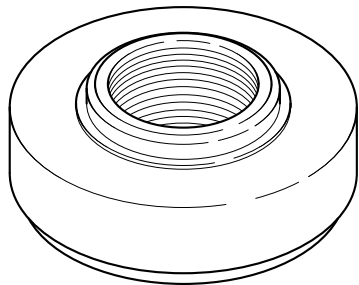


Valve Seat Grinding Stone
Tool No. 494304
Designed to be used with the Hall Toledo Grinder, P/N 494277.
Angle: 60° int.
Diameter: 2.75 in.



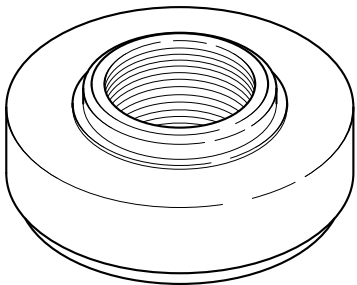
Valve Seat Grinding Stone
Tool No. 494305
Designed to be used with the Hall Toledo Grinder, P/N 494277.
Angle: 30° int.
Diameter: 2.75 in.

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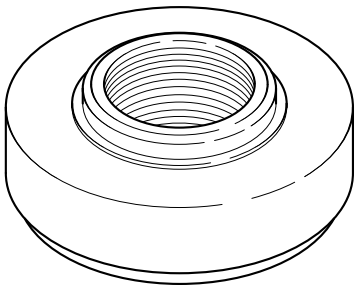
**Valve Seat Grinding Stone
Tool No. 494306**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 15° exh.
Diameter: 2.125 in.



**Valve Seat Grinding Stone
Tool No. 494307**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 45° exh.
Diameter: 2.125 in.



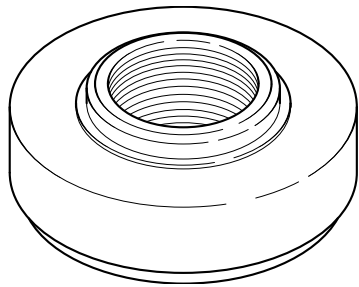
**Valve Seat Grinding Stone
Tool No. 494308**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 60° exh.
Diameter: 2.125 in.

F817G F1197G F1905G H2476G L3712G
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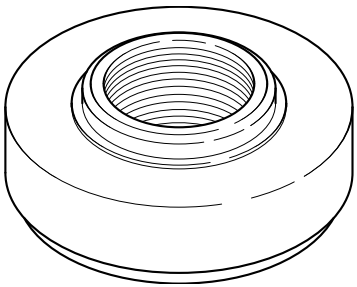
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F817G F1197G F1905G H2476G L3712G
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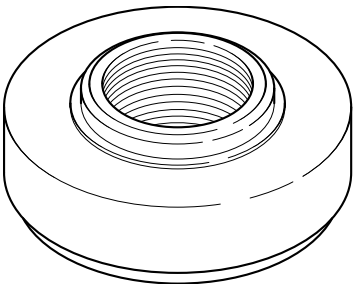
**Valve Seat Grinding Stone
Tool No. 494309**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 15° exh.
Diameter: 2.375 in.



**Valve Seat Grinding Stone
Tool No. 494310**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 45° exh.
Diameter: 2.375 in.



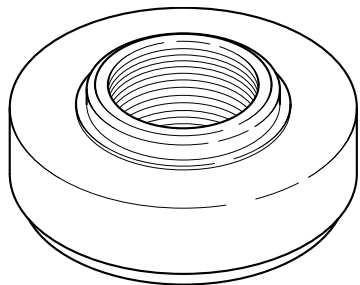
**Valve Seat Grinding Stone
Tool No. 494311**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 60° exh.
Diameter: 2.375 in.

F817G F1197G F1905G H2476G L3712G
■

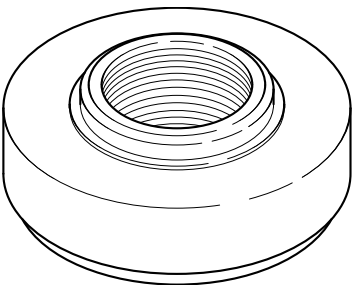
F817G F1197G F1905G H2476G L3712G
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F817G F1197G F1905G H2476G L3712G
■



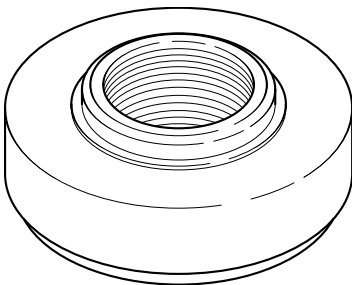
**Valve Seat Grinding Stone
Tool No. 494312**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 15° int.
Diameter: 3.375 in.



**Valve Seat Grinding Stone
Tool No. 494313**

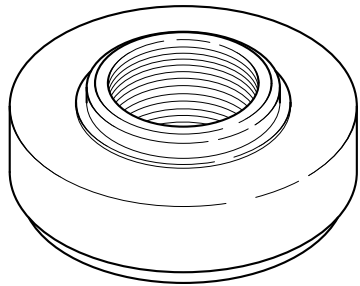
Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 30° int.
Diameter: 3.375 in.



**Valve Seat Grinding Stone
Tool No. 494314**

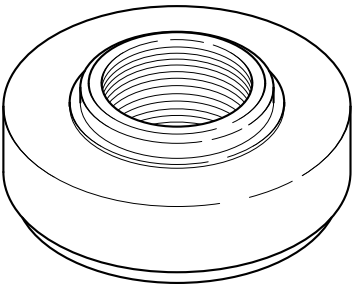
Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 60° int.
Diameter: 3.375 in.

F817G F1197G F1905G H2476G L3712G F817G F1197G F1905G H2476G L3712G F817G F1197G F1905G H2476G L3712G



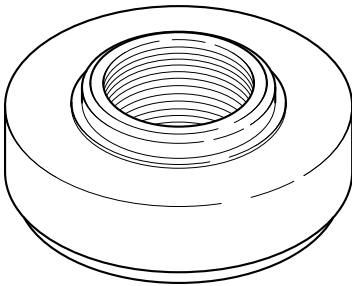
**Valve Seat Grinding Stone
Tool No. 494315**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 15° exh.
Diameter: 3.125 in.



**Valve Seat Grinding Stone
Tool No. 494316**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 45° exh.
Diameter: 3.125 in.



**Valve Seat Grinding Stone
Tool No. 494317**

Designed to be used with the Hall Toledo
Grinder, P/N 494277.
Angle: 60° exh.
Diameter: 2.75 in.

F817G F1197G F1905G H2476G L3712G F817G F1197G F1905G H2476G L3712G F817G F1197G F1905G H2476G L3712G

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