DEPARTMENT
OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS LIST

FOR

GRINDING KIT, VALVE SEAT (K O LEE CO, INC)

(4910-00-060-9983)

HEADQUARTERS,
DEPARTMENT OF THE ARMY

APRIL 1978

TECHNICAL MANUAL

No. 9-4910-600-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 21 April 1978

Operator, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts List for GRINDING KIT, VALVE SEAT (KO LEE CO, INC) (NSN 4910-00-060-9983)

REPORTING OF ERRORS

You can improve this manual by recommending improvements using DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of the manual and mail the form to Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished direct to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom the grinding kit is issued.

Manufactured by: K.O. Lee Co., Inc.
200 S. Harrison
Aberdeen, SD 57401

Procured under Contract No: DAAA09-76-C-6346

VALVE SEAT GRINDER

Designed to give years of trouble-free service. Pilots are hardened and ground. Driver incorporates a ball bearing type universal motor. Wheel dresser has positive stops for accurate dressing of wheel. Pilot wrench is of patented construction enabling quick insertion and release of pilot in guide. Wheel holders have hardened and ground bushings, ball bearing type have dust sealed bearings.

PILOTS

Each pilot ranges from —.003 to +.007 of basic range stamped on pilot.

Model P302BB

The Model P302BB box is of heavy gauge steel construction and has individual storage for all pilots available. Space is provided for storage of additional attachments and angle drive.

MODEL P302BB UNIVERSAL BALL BEARING VALVE SEAT GRINDER

DESIGNED TO SERVICE MOST CARS, TRUCKS, AND TRACTORS

Consists of the following equipment:

One P61		Pilot Wrench
One P83	5/16"	Self Expanding Pilot
One P84	11/32"	Self Expanding Pilot
One P84L	11/32"	Self Expanding Pilot (6-1/2" Length)
One P85	3/8"	Self Expanding Pilot
One P97R	.397"	Self Expanding Pilot
One P97	13/32"	Self Expanding Pilot
One P86	7/16"	Self Expanding Pilot
One P87	1/2"	Self Expanding Pilot
One P88	9/16"	Self Expanding Pilot
One P372		Wheel Dresser with No. P176D Diamond Screw
One P189		Tube Brush for cleaning Holder
One P196X		Ball Bearing Grinding Wheel Holder (11/16" Threaded End)
One P198X		Ball Bearing Grinding Wheel Holder (9/16" Threaded End
One P190B		Adapter Bushing (9/16" to 11/16") ..... No Charge
One P522V		Utility Driver with Safety Button Switch and 10 ft. 3 conductor cable with plug (3rd wire for ground), 110 volt AC-DC
One P223		Hexagonal Ball Terminal for 15/32" shaft
One P235	1-1/2"	General Purpose Grinding Wheel
One P235F	1-1/2"	Finishing Grinding Wheel
One P235R	1-1/2"	Roughing Grinding Wheel
One P237	1-5/8"	General Purpose Grinding Wheel
One P237F	1-5/8"	Finishing Grinding Wheel
One P237R	1-5/8"	Roughing Grinding Wheel
One P239	1-3/4"	General Purpose Grinding Wheel
One P239F	1-3/4"	Finishing Grinding Wheel
One P239R	1-3/4"	Roughing Grinding Wheel
One P241	1-7/8"	General Purpose Grinding Wheel
One P241F	1-7/8"	Finishing Grinding Wheel
One P241R	1-7/8"	Roughing Grinding Wheel
One P243	2"	General Purpose Grinding Wheel
One P247	2-1/4"	General Purpose Grinding Wheel
One P251	2-1/2"	General Purpose Grinding Wheel
One P500B		Tool Chest (16" high x 14-3/16" wide x 10 3/4" deep — Weight 21 lbs.)

Net Shipping Weight 45 lbs.

With the substitution of P190 for the P196X and the P191 for the P198X, the P302BB set becomes the P302 set

VALVE SEAT GRINDERS

Model P300 Basic Valve Seat Grinder

Designed to service cars, trucks, and tractors
In addition to the items listed below, the operator must select those stones, pilots, and other accessories necessary to service selected motors. Shipping Weight 39 lbs

One P61	Pilot Wrench
One P372	Wheel Dresser with No P176D Diamond Screw
One P189	Tube Brush for cleaning Holder
One P190	Grinding Wheel Holder (11/16" Threaded End)
One P5ZZV	Utility Driver with Safety Button Swith, 110V
One P223	Hexagonal Ball Terminal for 15/32" Shaft
One P5008	Box (10" high x 14-3/16" wide x 10-3/4" deep)

With substitution of P196X for P190, set becomes P300BB ball brg. set.

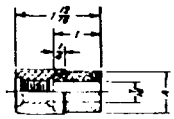
Model P301 Junior Valve Seat Grinder

Designed to service most makes of cars, small trucks, and tractors. Additional grinding wheels, pilots and other accessories may be purchased when needed. Shipping Weight 41 lbs

One P61	Pilot Wrench
One P83	5/16" Self Expanding Pilot
One P84	11/32" Self Expanding Pilot
One P85	3/8" Self Expanding Pilot
One P97R	Self Expanding Pilot Oldsmobile Rocket)
One P372	Wheel Dresser with No P176D Diamond Screw
One P189	Tube Brush for cleaning Holder
One P190	Grinding Wheel Holder 11/16" Threaded End)
One P5ZZV	Utility Driver with Safety Button Switch, 110V
One P223	Hexagonal Ball Terminal for 15/32" Shaft
One each of the following Grinding Wheels:	
P235 1-1/2", P237 1-5/8", P239 1-3/4"	General Purpose
P235F 1-1/2", P237F 1-5/8", P239F 1-3/4"	Finishing
P235R 1-1/2", P237R 1-5/8", P239R 1-3/4"	Roughing
One P5008	Box (10" high x 14-3/16" wide x 10-3/4" deep)

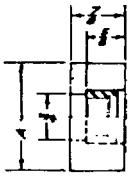
With substitution of P196X for P190, set becomes P301BB ball brg. set.

VALVE SEAT GRINDING WHEELS



P224, P225, P226, P224R, P225R, P226R, P224F, P225F, P226F Wheels. Pilots with suffix letter L should be used.

Wheels shown on the right with short hubs will remain in service until completely used. Wheel can be dressed 30° top side of wheel and 45° bottom side 1 wheel serving 2 purposes



GENERAL PURPOSE	FINISHING WHEELS	ROUGHING WHEELS	A-DIAM.	GENERAL PURPOSE	FINISHING WHEELS	ROUGHING WHEELS	A-DIAM.
P224	P224F	P224R	⅞"	P238	P238F	P238R	1 11/16"
P225	P225F	P225R	1"	P239	P239F	P239R	1 ¾"
P226	P226F	P226R	1 ⅛"	P240	P240F	P240R	1 13/16"
P227	P227F	P227R	1 ¼"	P241	P241F	P241R	1 15/16"
P228	P228F	P228R	1 5/16"	P242	P242F	P242R	1 15/16"
P229	P229F	P229R	1 ⅜"	P243	P243F	P243R	2 ⅛"
P231	P231F	P231R	1 7/16"	P245	P245F	P245R	2 3/16"
P232	P232F	P232R	1 ½"	P247	P247F	P247R	2 5/16"
P233	P233F	P233R	1 9/16"	P251	P251F	P251R	2 7/16"
P234	P234F	P234R	1 5/8"	P255	P255F	P255R	2 ½"
P235	P235F	P235R	1 11/16"	P259	P259F	P259R	3 ⅛"
P236	P236F	P236R	1 ¾"	P261	P261F	P261R	3 3/16"
P237	P237F	P237R	1 13/16"	P263	P263F	P263R	3 5/16"

GRINDING WHEELS FOR STELLITE

No.	A-Diam.	No.	A-Diam.	No.	A-Diam.	No.	A-Diam.
P231S	1 ¼"	P237S	1 5/8"	P243S	2 ⅛"	P251S	2 7/16"
P233S	1 9/16"	P239S	1 ¾"	P245S	2 3/16"	P255S	2 ½"
P235S	1 11/16"	P241S	1 15/16"	P247S	2 5/16"	P259S	3 ⅛"

Wheel shave ½"—16thd. All other K-O Wheels have ⅝"—16thd.

Wheels with "⅝" S.A.E. threads can be used on "½" threaded end holders and those made by other manufacturers by using a No. P190B Bushing ("½" to ⅝").

Wheels P224, P225, P226, P227, P228, P229 are designed for small engine service.

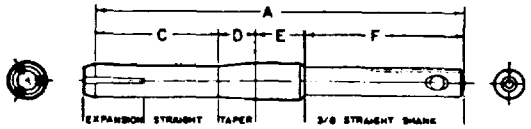
GENERAL PURPOSE

Grinding Wheels

WHEELS HAVE 13/16"—15 THREAD

No.	A-Diam.	No.	A-Diam.	No.	A-Diam.	No.	A-Diam.
P236K	1 ¼"	P241K	1 15/16"	P247K	2 5/16"	P259K	3 ⅛"
P237K	1 5/8"	P243K	2 ⅛"	P251K	2 7/16"	P261K	3 3/16"
P239K	1 ¾"	P245K	2 3/16"	P255K	2 ½"	P263K	3 5/16"

SELF EXPANDING PILOTS



The Simplest, Most Accurate Pilot Made!

All advantages of a solid one-piece taper pilot plus the accuracy and rigidity assured by the expansion of the lower end.

The true center of a worn guide is found and as a result the valve seat is reconditioned concentric with the actual operating line of movement of the valve stem.

The taper that contacts the upper part of the guide is slight. The pilot anchors deep down in the guide where proper bearing is obtained.

Part No.	Pilot Size	A	C	D	E	F
P95S	¼	4 31/32	15/32	⅜		3
P95	¼	5 31/32	1 15/32	⅜		3 ⅜
P95L	¼	6 31/32	1 15/32	⅜		4 ⅜
P96S	5/32	4 31/32	15/32	⅜		3
P96	5/32	5 31/32	1 15/32	⅜		3 ⅜
P96L	5/32	6 31/32	1 15/32	⅜		4 ⅜
P83S	5/16	4 15/16	1 5/16	5/16		2 ⅜
P83	5/16	5 15/16	1 5/16	⅜		2 ⅜
P83R	5/16 +.015	5 15/16	1 5/16	⅜		2 ⅜
P83RL	5/16 +.015	6 15/16	1 5/16	⅜	½	3 ⅜
P83L	5/16	6 15/16	1 5/16	⅜	½	3 ⅜
P84S	11/32	4 15/16	1 5/16	5/16		2 ⅜
P84	11/32	5 15/16	1 5/16	⅜		2 ⅜
P84M	11/32	4 15/16	1 13/16	⅜		1 13/16
P84L	11/32	6 15/16	1 5/16	⅜		3 ⅜
P84R	11/32 +.015	5 15/16	1 5/16	⅜		2 ⅜
P84RL	11/32 +.015	6 15/16	1 5/16	⅜		3 ⅜
P85S	3/8	4 15/16	1 5/16	5/16		2 ⅜
P85F	.370	5 5/16	2	⅜		3
P85	3/8	5 5/16	2	⅜		3
P85R	3/8 +.015	5 5/16	2	⅜		3
P85RL	3/8 +.015	7	2	⅜	½	3 ½
P85L	3/8	7	2	⅜	½	3 ½
P97R	.397	5 5/16	1 5/16	⅜		3 ⅜
P97	13/32	6	2	⅜		3 ½
P97M	13/32	7 ½	2 ½	⅜	½	3 ½
P97RM	13/32 +.010	7 ½	2 ½	⅜	½	3 ½
P97L	13/32	8 ½	2 ½	⅜	1 ½	3 ½
P86S	7/16	5 ½	1 ½	⅜		3
P86	7/16	6 ½	2 ½	⅜		3
P86M	7/16	7 ½	2 ½	⅜	½	3 ½
P86RM	7/16 +.015	7 ½	2 ½	⅜	½	3 ½
P86L	7/16	8 ½	2 ½	⅜	1 ½	3 ½
P94M	15/32	7 ½	2 ½	⅜	½	3 ½
P87S	½	6 ½	2	⅜		3 ½
P87	½	6 ½	2 ½	⅜		3 ½
P87L	½	8 ½	2 ½	⅜	1 ½	3 ½
P87M	½	7 ½	2 ½	⅜	½	3 ½
P93	17/32	6 ¾	2 ½	⅜		3 ½
P88	9/16	6 ½	2 ½	⅜		3
P88M	9/16	7 ½	2 ½	⅜	½	3 ½
P88L	9/16	8	2 ½	⅜	1	3 ½
P92	19/32	5 ½	1	⅜	½	3
P89	5/8	6 ½	2 ½	⅜		3
P9R	5/8	6 ½	2 ½	⅜		3
P9RL	5/8	8 ½	2 ½	⅜	1 ½	3 ½
P99	½	6 ¾	2 ½	1		3 ½
P91L	1 1/32	4 ¾	½	½		3 ½
P5216S	5 1/2 MM	4 7/32	15/32	⅜		2 ⅜
P8216	5 1/2 MM	4 13/16	1 ¼	⅜		3
P8236	6MM	4 13/16	1 ¼	⅜		2 ½
P8236S	6MM	4 ⅛	15/32	⅜		2 ⅜
P8255	6 1/2 MM	4 13/16	1 ¼	⅜		2 ½
P8275	7MM	4 13/16	1 ¼	⅜		2 ¾
P8295	7 1/2 MM	5 ⅛	1 7/16	⅜		3
P8315	8MM	5 ⅛	1 7/16	⅜		3
P8331	8 1/2 MM	5 ⅛	1 7/16	⅜		3
P8356	9MM	5 ⅛	1 7/16	⅜		3
P8374	9 1/2 MM	5 ¾	2	⅜		3
P8393	10MM	5 ¾	2	⅜		3
P8433	11MM	5 ¾	1 ½	½		3
P8472	12MM	6 ¼	2 ¼	½		3 ½
P8820	.820	4 ¾	½	½		3 ½

P90 .850" Special Pilot for V-8 60.

P91 1-1/32"x1" Special Pilot for V-8 for use when lifters are removed from engine.

Each pilot ranges from —.003" to +.007" of basic range stamped on pilot. One pilot does the work of several solid type pilots.