



**INSPECTION PROTOCOL
BOOK**

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PILECO INSPECTION PROTOCOL – DIESEL HAMMER SERVICE RECORD

Hammer Model:		Work Order No.:	
Hammer Serial No.:		Date:	
Customer:			
Name of Service Technician:		Signature:	

Condition Upon Arrival

Good _____	Fair _____	Poor _____
Comments:	Comments:	Comments:

Injection Valve Serial #

Lube Pump Serial #

Fuel Pump Serial #

Hydraulic Trip Serial #

Soft Start Serial #

Piston (Ram) Serial #

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Anvil (Impact Block) Serial #

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PILECO INSPECTION PROTOCOL – PISTON & IMPACT BLOCK

Piston & Impact Block Diameters-Original Manufacturers Dimensions:

type	D8	D12	D19	D25, D30	D36, D46	D50	D62	D70	D80, D100	D125, D138	D160 D180	D225, D250, D280
Piston dia. 1	9.815"	11.771"	12.55"	16.47"	19.60"	19.60"	21.57"	21.51"	24.704"	28.228"	32.165"	36.850"
Piston dia. 2	9.823"	11.791"	12.57"	16.51"	19.65"	19.65"	21.62"	21.62"	24.763"	28.307"	32.244"	36.929"
Length of Piston	94.09"	104.13"	128.7"	102.9" 123.2"	106.8" 137.7"	149.69 "	149.2"	168.45 "	147.24" 182.83"	173.62"	172.63"	188.54" 208.66" 227.56"
Length of lifting groove	71.26"	72.44"	70.86"	75.98"	76.38"	76.38"	111.8"	111.8"	107.87" 114.17"	114.57"	122.04"	
Piston ring width	0.241"	0.278"	0.278"	0.396"	0.396"	0.396"	0.475"	.475"	0.475"	0.514"	0.553"	.629"
Catch ring width	0.477"	0.552"	0.552"	0.790"	0.790"	0.790"	0.790"	.790"	0.947"	1.102"	1.183"	1.259"

Out of round and undersized diameter pistons reduce the diesel hammer performance. Piston replacement is not necessary outside of these tolerances above, but should be considered if out of round values are exceeded

Max. original piston clearance	0.035	0.032	0.036	0.036	0.044	.044	0.047	0.047	0.056	0.055	0.055	
Max. out of round	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.12	

Note:

- . Out of round pistons worn out piston rings and ring grooves cause excessive cylinder wear and poor hammer performance. Low compression leads to damage of the piston face, broken piston rings or pistons.
- . Piston ring and catch ring grooves should be rebuilt if the ring clearance is larger than 0.02" for small hammers up to the D46 and larger than 0.03" for the large hammers.
- . Welding up the ring grooves for temporary repair is possible with cast iron welding stick from Lincoln Electric "SOFTWELD 99% Ni" welding stick (a very clean area is required)

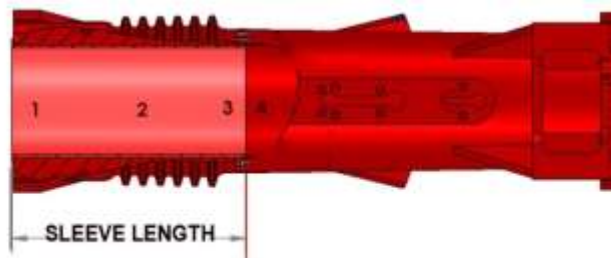
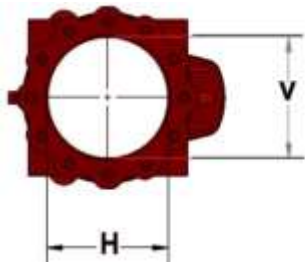


Measuring Location	Diameter Horizontal	Diameter Vertical
Piston Diameter 1		
Piston Diameter 2		
Anvil Diameter		
Comments: .general wear, scratches, grooves .material buildup .cracks in the ring grooves		
Name of Service Tech:	Signature:	

PILECO INSPECTION PROTOCOL – LOWER CYLINDER

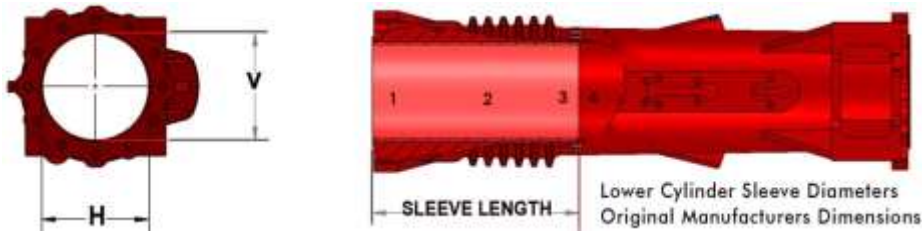
Lower Cylinder Sleeve Diameters – Original Manufactures dimensions:

type	D6 D8	D12	D19	D25 D30	D36 D46	D50	D62	D70	D80 D100	D125 D138	D160 D180	D225, D250, D280
New sleeve ∅	9.846"	11.811"	12.602"	16.535"	19.68"	19.68"	21.656"	21.65"	24.803"	28.346"	32.283"	37.008"
Sleeve length	16.14"	25.98"	26.77"	26.77"	26.77"	26.77"	18.50"	21.65"	25.98"	26.38"	30.39"	43.31"
Resleeving is required if max. wear or shape of cylinder bore exceeds given values below												
Max. wear	0.035"	0.035"	0.035"	0.040"	0.040"	0.040"	0.050"	0.050"	0.050"	0.055"	0.060"	0.065"
Max. out of round	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.010"



Measuring Location	Diameter Horizontal(H)	Diameter Vertical (V)
Location 1		
Location 2		
Location 3		
Location 4		
Comments: .about wear .scratches/grooves .noticeable steps at sleeve ends .material buildup .cracks .other unusual appearance		
Name of Service Tech:	Signature:	

PILECO INSPECTION PROTOCOL – LOWER CYLINDER ORIGINAL DIMENSION



type	D6 D8	D12	D19	D25 D30	D36 D46	D50	D62	D70	D80 D100	D125 D138	D160 D180	D225, D250, D280
New sleeveØ	9.846"	11.811"	12.602"	16.535"	19.685"	19.68"	21.656"	21.65"	24.803"	28.346"	32.283"	37.008"
Sleeve length	16.14"	25.98"	26.77"	26.77"	26.77"	26.77"	18.50"	21.65"	25.98"	26.38"	30.39"	43.31"
Resleeving is required if max. wear or shape of cylinder bore exceeds given values below												
Max. wear	0.035"	0.035"	0.035"	0.040"	0.040"	0.040"	0.050"	0.050"	0.050"	0.055"	0.060"	0.065"
Max. out of round	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.008"	0.080"	0.008"	0.008"	0.008"	0.010"

Piston & Impact Block Diameters –Original Manufacturers Dimensions

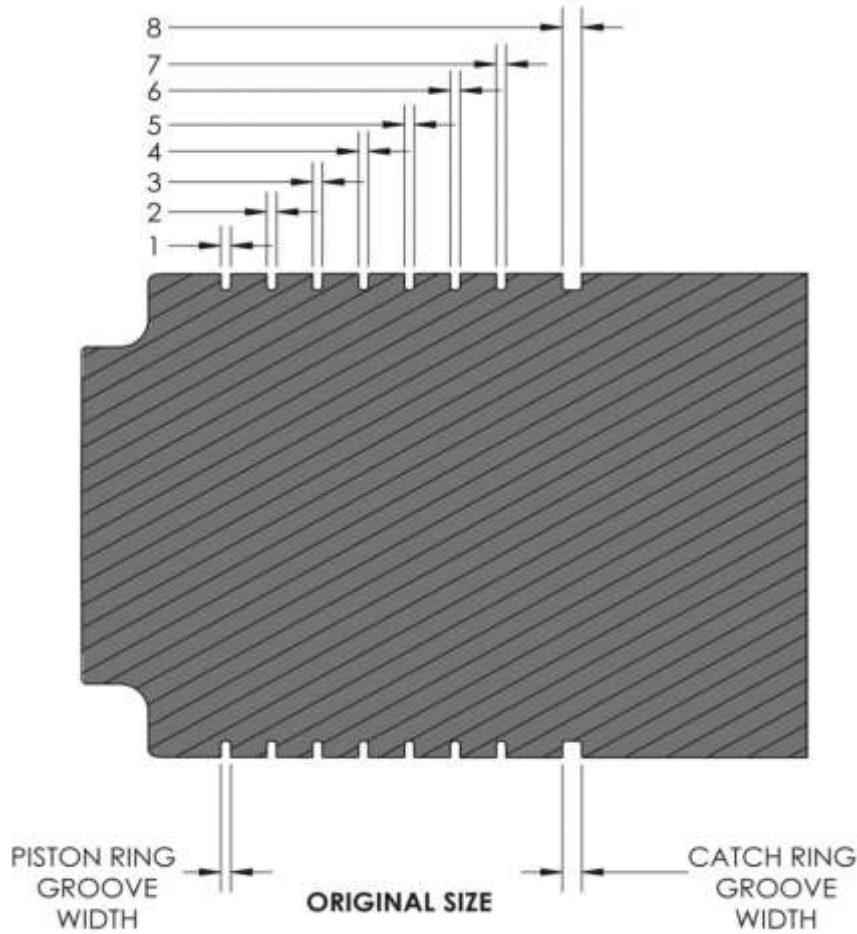


type	D8	D12	D19	D25, D30	D36, D46	D50	D62	D70	D80, D100	D125, D138	D160 D180	D225, D250, D280
Piston dia. 1	9.815"	11.77"	12.559"	16.472"	19.606"	19.60"	21.574"	21.51"	24.704"	28.228"	32.165"	36.850"
Piston dia. 2	9.823"	11.79"	12.578"	16.515"	19.657"	19.65"	21.625"	21.62"	24.763"	28.307"	32.244"	36.929"
Length of Piston	94.09"	104.13 "	128.74"	102.95" 123.23"	106.89" 137.79"	149.69"	149.21"	168.45 "	147.24" 182.83"	173.62"	172.63"	188.54" 208.66" 227.56"
Length of lifting groove	71.26"	72.44"	70.86"	75.98"	76.38"	76.38"	111.81"	111.8"	107.87" 114.17"	114.57"	122.04"	
Piston ring width	0.241"	0.278"	0.278"	0.396"	0.396"	0.396"	0.475"	0.475"	0.475"	0.514"	0.553"	0.629"
Catch ring width	0.477"	0.552"	0.552"	0.790"	0.790"	0.790"	0.790"	0.790"	0.947"	1.102"	1.183"	1.259"
Out of round and undersized diameter pistons reduce the diesel hammer performance. Piston replacement is not necessary outside of these tolerances above, but should be considered if out of round values are exceeded												
Max. original piston clearance	0.035	0.032	0.036	0.036	0.044	0.044	0.047	0.047	0.056	0.055	0.055	
Max. out of round	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.12	

Note:

- . Out of round pistons worn out piston rings and ring grooves cause excessive cylinder wear and poor hammer performance. Low compression leads to damage of the piston face, broken piston rings or pistons.
- . Piston ring and catch ring grooves should be rebuilt if the ring clearance is larger than 0.02' for small hammers up to the D46 and larger than 0.03"for the large hammers.
- . Welding up the ring grooves for temporary repair is possible with cast iron welding stick from Lincoln Electric "SOFTWELD 99% Ni" welding stick(a very clean area is required)

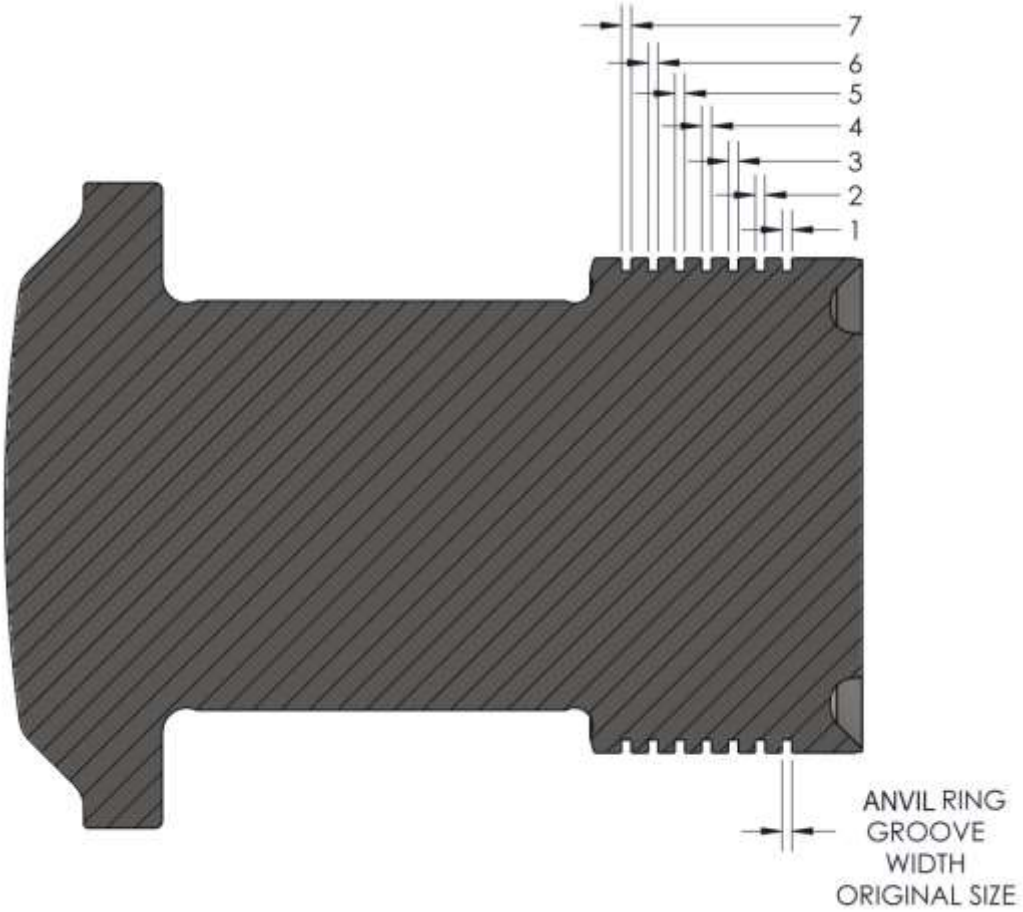
PILECO INSPECTION PROTOCOL – PISTON GAP



Measure Location:

Piston Ring Groove Width 1	
Piston Ring Groove Width 2	
Piston Ring Groove Width 3	
Piston Ring Groove Width 4	
Piston Ring Groove Width 5	
Piston Ring Groove Width 6	
Piston Ring Groove Width 7	
Piston Ring Groove Width 8	

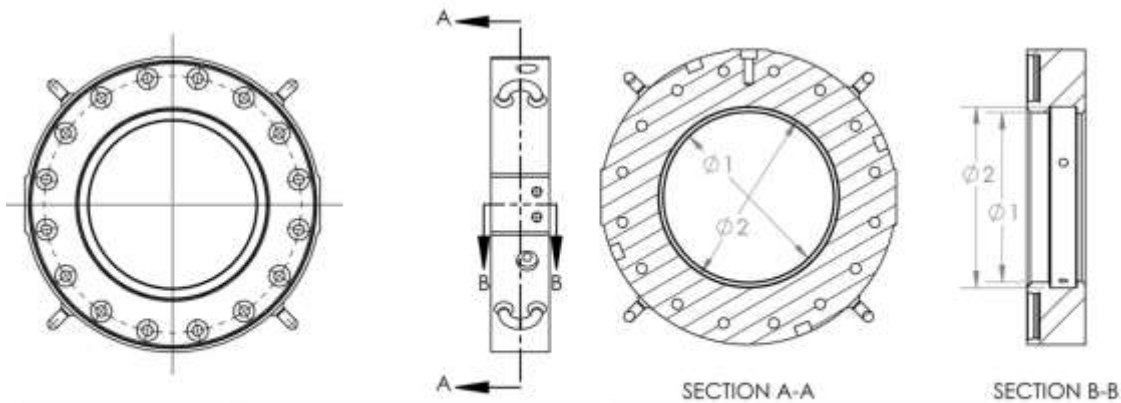
PILECO INSPECTION PROTOCOL – ANVIL GAP



Measure Location:

Anvil Ring Groove Width 1	
Anvil Ring Groove Width 2	
Anvil Ring Groove Width 3	
Anvil Ring Groove Width 4	
Anvil Ring Groove Width 5	
Anvil Ring Groove Width 6	
Anvil Ring Groove Width 7	
Anvil Ring Groove Width 8	

PILECO INSPECTION PROTOCOL – LOWER ENDRING



	Ø 1	Ø 2	ID of Inner Cylinder Endring	Suggest Max. Wear of Ø
D6/D8	200	204	200	1mm
D12	240	244	240.2	1mm
D16/D19	260	264	260.3	1mm
D25/30	330	338	330.3	1mm
D36/D46/D50	390	398	390.5	1.5mm
D62/D70	440	448	440.5	1.5mm
D80/D100	520	528	520.5	1.5mm
D125/D138	600	608	600.6	2mm
D160/D180	690	696	690.6	2mm
D225/D250/ D280	780	790	780.6	2mm

Measuring Location	Diameter Horizontal(H)	Diameter Vertical (V)
Diameter 1		
Diameter 2		
Comments: .about wear .scratches/grooves .material buildup .cracks in ring grooves .other unusual appearance		
Name of Service Tech:	Signature:	

PILECO INSPECTION PROTOCOL – FUEL PUMP & LEVER

Service Order#:	Date:
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Fuel Pump Output per Stroke at Setting 4

type	Qty.of Injection valves	Control Dimension		Supply Qty. (cm ³ /stroke)	Pump Element diameter(mm)
		mm	inch		
D6-42	1	52.5 ^{+0.3}	2.067	1.60	14
D8-42	1	53.5 ^{+0.3}	2.106	1.75	14
D12-42	1	54.0 ^{+0.3}	2.126	2.10	15
D16-32	1	54 ^{+0.3}	2.126	2.40	16
D19-42	1	54.6 ^{+0.3}	2.150	3.54	19
D22-32	1	53.5 ^{+0.3}	2.106	3.61	20
D25-32	2	54.5 ^{+0.3}	2.145	3.90	20
D30-32	2	54.5 ^{+0.3}	2.145	4.70	22
D36-32	2	54.0 ^{+0.3}	2.126	5.65	24
D46-32	2	54.5 ^{+0.3}	2.145	7.15	27
D50-32	2	54.7 ^{+0.3}	2.153	7.82	28
D62-22	2	53.5 ^{+0.3}	2.106	8.70	31
D70-32	2	54 ^{+0.3}	2.126	9.60	32
D80-23	4	55.0 ^{+0.3}	2.165	10.50	32
D100-13	4	55.0 ^{+0.3}	2.165	12.50	35
D125-32	4	55.5 ^{+0.3}	2.185	15.50	39
D138-32	4	55.5 ^{+0.3}	2.185	17.50	41
D160-32	4	53.5 ^{+0.3}	2.106	21.00	45
D180-32	4	53.5 ^{+0.3}	2.106	23.50	48
D225-22	4	55 ^{+0.3}	2.165	17.0 x 2	41
D250-22	4	55.6 ^{+0.3}	2.189	18.0 x 2	41
D280-22	4	54 ^{+0.3}	2.125	19.0 x 2	45



Please Read: Index values listed above are for the control dimension and supply quantity. Adjusting the fuel pump to higher or lower fuel supply may be necessary. This is caused by different driving and hammer conditions. Allowing hammer to achieve or not to exceed the minimum blow count (max. stroke).

Inspection Data

Fuel Pump Serial No.:	Pump Element size:	Fuel Pump Serial No.:	Pump Element size:
Hammer Serial No.:		Date:	
Setting 4	Control Dimension	mm	
	Fuel Output	Cm ³ /20 stroke	
Minimum Hammer Blow Count		1/min	
Paired Injection		Serial#	
Part #	Qty.	Description	
Name of Service Tech.:		Signature:	

PILECO INSPECTION PROTOCOL – FUEL PUMP ORIGINAL DIMENSION

General Conditions & Procedure

Steam clean		Fuel pump	Bench test output setting 4 output setting 1 Inspect regulating mechanism Inspect shut off and control ropes
Inspect hammer guiding			
Inspect fuel lines			
Inspect oil delivery lines			
Inspect rubber ring		Lube pump	Check function
Inspect compression rings		Start. device	Check pawl Check and actuate trip cam with lever Check carrier assembly for proper function Inspect guide gibs and connection hardware Lubricate carrier assembly
Inspect catch ring and groove			
Inspect inner cylinder end ring			
Inspect piston and impact block			
Paint equipment			
piston	- unusual wear, - scratches, grooves - material build up - cracks in the ring grooves		
Lower cylinder	- unusual wear, - scratches / grooves - noticeable steps at sleeve ends - material build up - cracks		

Fuel Pump Standard Settings

type	Qty. of Injection valves	Control Dimension		Supply Qty. (cm ³ /stroke)	Pump Element diameter(mm)
		mm	inch		
D6-42	1	52.5 ^{+0.3}	2.067	1.60	14
D8-42	1	53.5 ^{+0.3}	2.106	1.75	14
D12-42	1	54.0 ^{+0.3}	2.126	2.10	15
D16-32	1	54 ^{+0.3}	2.126	2.40	16
D19-42	1	54.6 ^{+0.3}	2.150	3.54	19
D22-32	1	53.5 ^{+0.3}	2.106	3.61	20
D25-32	2	54.5 ^{+0.3}	2.145	3.90	20
D30-32	2	54.5 ^{+0.3}	2.145	4.70	22
D36-32	2	54.0 ^{+0.3}	2.126	5.65	24
D46-32	2	54.5 ^{+0.3}	2.145	7.15	27
D50-32	2	54.7 ^{+0.3}	2.153	7.82	28
D62-22	2	53.5 ^{+0.3}	2.106	8.70	31
D70-32	2	54 ^{+0.3}	2.126	9.60	32
D80-23	4	55.0 ^{+0.3}	2.165	10.50	32
D100-13	4	55.0 ^{+0.3}	2.165	12.50	35
D125-32	4	55.5 ^{+0.3}	2.185	15.50	39
D138-32	4	55.5 ^{+0.3}	2.185	17.50	41
D160-32	4	53.5 ^{+0.3}	2.106	21.00	45
D180-32	4	53.5 ^{+0.3}	2.106	23.50	48
D225-22	4	55 ^{+0.3}	2.165	17.0 x 2	41
D250-22	4	55.6 ^{+0.3}	2.189	18.0 x 2	41
D280-22	4	54 ^{+0.3}	2.125	19.0 x 2	45



