COOPER Tools

Parts Manual • Ersatzteil–Liste

PL31–15LS2 02/00

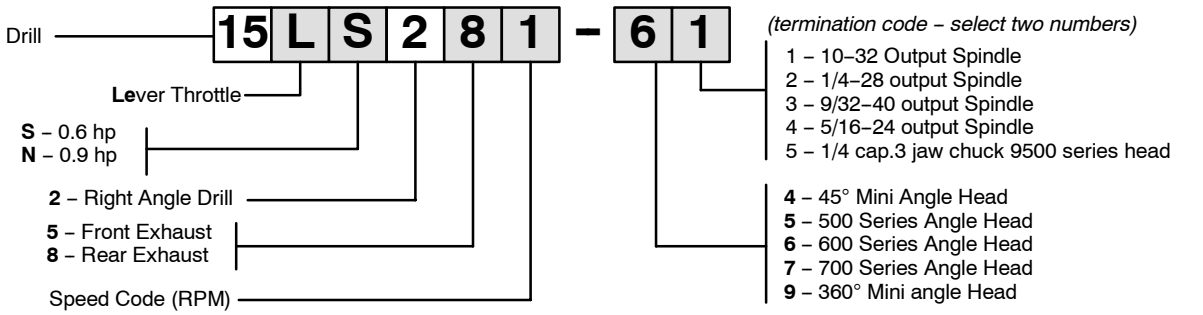
DOTCO®

45–8400

15LS2.. and 15LN2..
15SS2.. and 15SN2..

0.6 hp & 0.9 hp ERGO Angle Drills

Typical Model / Typisches Modell



NOTE: Termination code specifies the angle head required for the specific application.

	500 series Angle Heads		600, 700, 45° & 360° Angle Heads	
	15LS	**15LN**	**15LS**	**15LN**
1 -----	3800	3500	5430	5000
2 -----	2360	2170	3370	3100
3 -----	1410	1300	2010	1850
4 -----	1160	1070	1660	1530
5 -----	950	870	1360	—
6 -----	590	540	840	—
7 -----	350	320	500	—
8 -----	—	4200	—	6000

CooperTools
P.O. BOX 1410
LEXINGTON, SOUTH CAROLINA 29071–1410

SAFETY FIRST!

ALWAYS COMPLY WITH:

1. General Industry Safety & Health Regulations, Part 1910, OSHA 2206, available from: Sup't of Documents; Government Printing Office; Washington DC 20402
2. Safety Code for Portable Air Tools, ANSI B186.1 available from: American National Standards Institute, Inc.; 1430 Broadway; New York, NY 10018
3. State and Local regulations.

Portions of the above codes and regulations are listed below for quick reference.

THESE EXCERPTS ARE NOT INTENDED TO BE ALL INCLUSIVE – STUDY AND COMPLY WITH ALL REGULATIONS!

WARNING FAILURE TO COMPLY WITH ALL SAFETY REGULATIONS MAY RESULT IN SERIOUS INJURY.

1. TOOL INTENT — Tools shall be used only for purposes intended in their design (refer to product catalog).
2. AIR SUPPLY — Test and operate tools at 90 PSIG maximum unless tool is marked otherwise. Use recommended airline filters—regulators—lubricators.
3. UNUSUAL SOUND or VIBRATION — If tool vibrates or produces an unusual sound, repair immediately for correction.
4. OPERATOR PROTECTIVE EQUIPMENT — Wear goggles or face shield at all times tool is in operation. Other protective clothing shall be worn, if necessary. SEE REGULATIONS.
5. SAFETY MAINTENANCE PROGRAM — Employ a safety program to provide inspection and maintenance of all phases of tool operation and air supply equipment in accordance with *"Safety Code for Portable Air Tools."*

Safe Work Practices Symbol

WARNING The signal word *"Warning"* identifies all notes on safe work practices in this operating instruction, alerting to hazards for life and health of people. Observe these notes and proceed with special care in the cases described. Pass all safety instructions on to other operators. In addition to the safety instructions in this operating instruction, the general local safety and accident prevention rules must be observed.

Important Notes

CAUTION The signal word *"caution!"* identifies all portions of this operating instruction meriting special attention to ensure that guidelines, rules, hints and the correct work procedures are observed; and, to prevent damage to and destruction of the machine and/or parts.

1 The number in a square is a *"service note"* reference indicating additional information for the correct assembly or disassembly of this product. See Service Note page at end of this manual.

(•) Indicates recommended spare part (or set) for every five (5) tools. Small, low cost or easily lost parts should be stocked as 3-4 per 10 tools.

WARNING ***Disconnect the air supply hose before servicing the tool.***

INSTALLATION & OPERATION

All 15LN2.. & 15LS2.. models covered by this parts list...

These models are lever operated horizontal–type motors with angle heads. The operator actuates and releases the lever which starts and stops the air motor, gearing and output spindle.

For best tool performance, a working air pressure of **90 pounds per square inch** is recommended. Pipings, fittings and hose should be adequate to maintain **90 psig** while the tool is in operation. An air line filter and lubricator, such as Cooper Power Tool's #F02–M Filter (1/4" NPT) and #L02–EP Lubricator (1/4" NPT) should be used **(refer to Cooper's "F–R–L" brochure)**. Hose should be blown out before attaching to the tool.

LUBRICATION

Motor

Lubricate the motor with an air line lubricator, using a light air tool oil. Adjust the lubricator to dispense one drop per cycle or three drops per minute. This oil is available in one (1) quart *(540397)* or one (1) gallon *(533485)* quantities. A high film strength oil *(536333)* is also available; this oil cannot be used in Atomist type lubricators, use only with Economist or serv-oil type lubricators.

Planetary Gearing

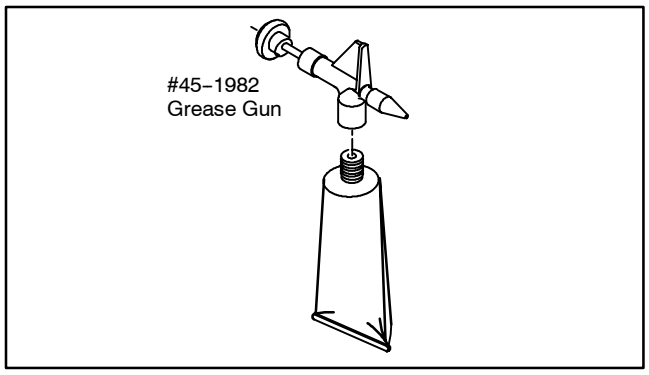
Thoroughly grease all gears with Cooper Power Tools teflon grease every 100,000 cycles. Whenever the tool is disassembled, pack the gearing with approximately 1/4 ounce of grease. Teflon grease is available in one (1) pound cans *(513156)* or two (2) oz. tube *(540395)*.

Establish a routine inspection and re–lubrication program, **don't short cut.** Re–lubricate planetary by filling 1/3 to 1/2 full. Midget grease fittings are provided on the gear housings and internal gears for external lubrication. Too much grease will cause overheating.

CAUTION *Do not use substitutes for oil and grease. This could result in damage to the tool.*

Angle Head Gear Lubrication

When angle head gearing is replaced, wipe on a **thin** coat of Molykote, grade G; only a small amount is necessary. An 8 ounce tube is available under part number 540394. Molykote has been shown to improve the wearing characteristics of angle gearing.

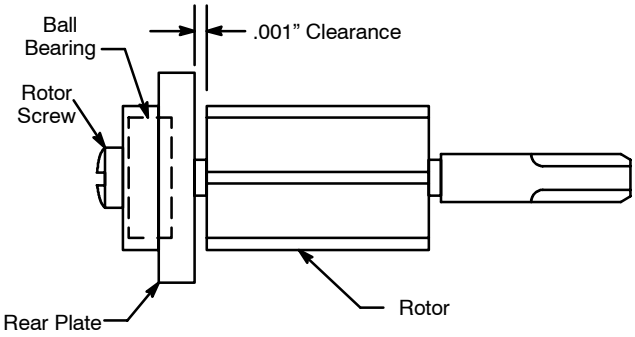


PARTS INSPECTION

1. Wash all parts except ball bearings in solvent. Dry and place on a clean cloth for inspection.
2. Check ball bearings for wear. Bearings should turn smoothly with no appreciable shake or looseness.
3. Check rotor blades for wear by comparing with a new blade. Replace if worn more than 1/32" in height.
4. Check motor cylinder for grooves, gouges or pitting. Honing is permissible, however, never remove more than about 0.001" or 0.002" of material. Replacement is usually recommended.

DOTCO® 15LS2.. & 15LN2.. Series SERVICE NOTES

1 SERVICE NOTE 1:

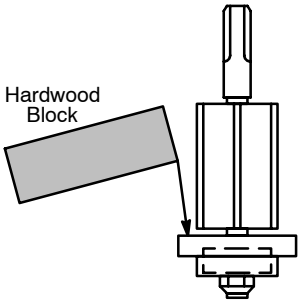


Assemble rotor to rear plate/bearing assembly with the rotor's retaining screw. *Position and set the rotor as close as possible to the rear plate, without dragging or rubbing.*

a. A good practice is to stone the blade slots and polish the ends with a medium grit emery cloth.

b. Assemble components making sure the bearing is firmly seated in the rear plate.

Caution! Begin tightening the rotor screw but do not over-tighten. This could cause damage to the bearing. Alternately spin the rotor while tightening the screw until a clearance of approximately 0.001" is achieved.



Hold the rotor and rear plate assembly vertically (plate downward) and strike the edge of the plate with a wood block. This helps seat the threaded components.

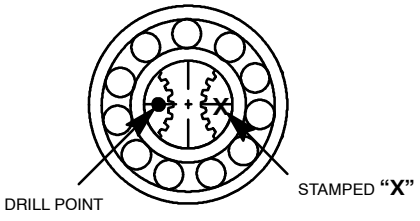
2 SERVICE NOTE 2:

TIMING OF THE STEP REDUCTION GEAR ASSEMBLY

For Speed Code 4 Models
EXAMPLE:
15LS284..

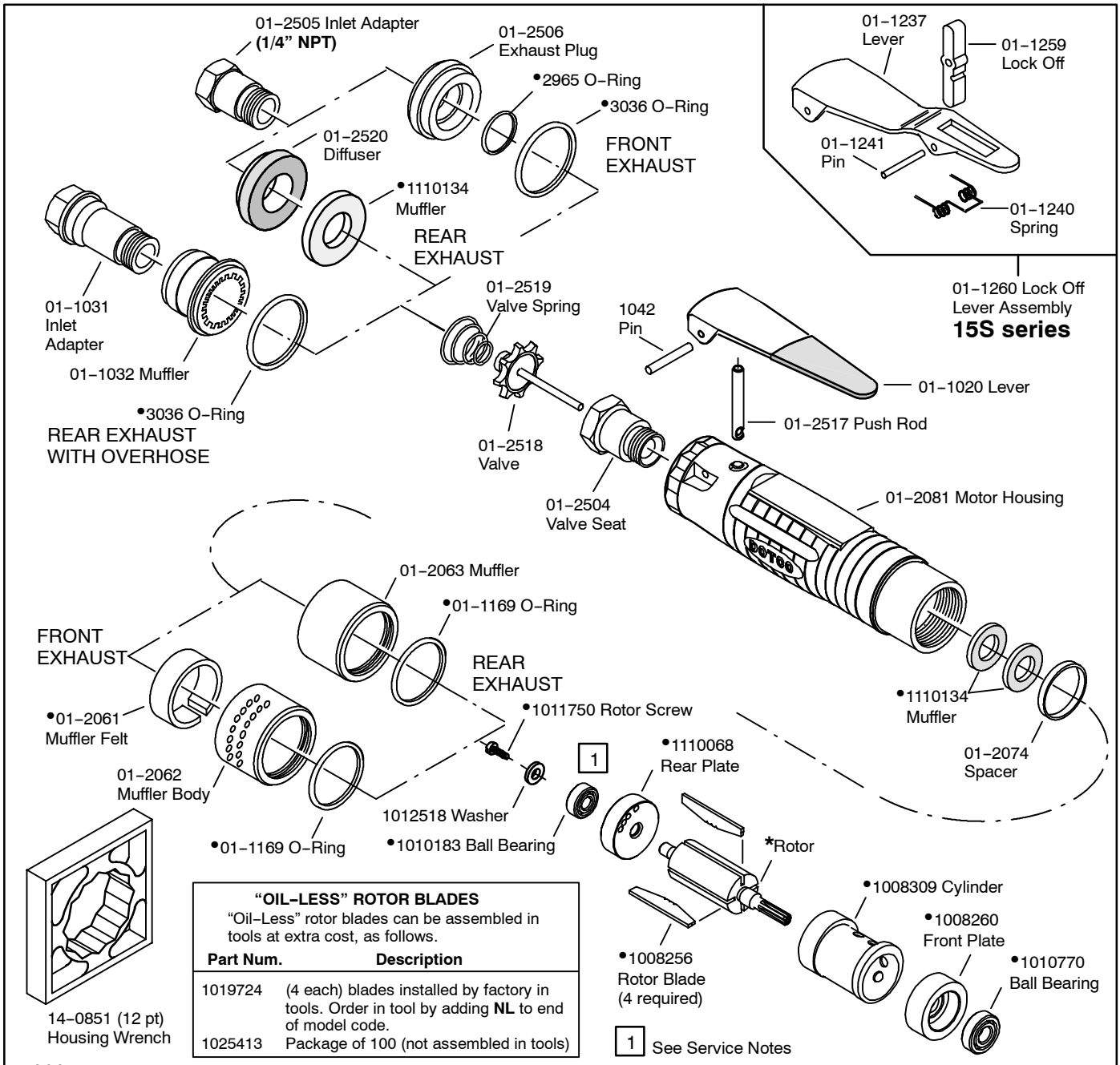
Assemble the planet gears into the planet cage, making sure the notched planet pins fit over the planet cage washer. Rotate each gear until the aligning hole — on the end of one gear — is diametrically opposite the **"X"** mark of the other gear. Hold the gears in this position and slip the planet cage into the internal gear. This is important to avoid "wiping out" the gear teeth.

This is the only position where the gear teeth are lined up.



DOTCO

15LS Series (0.6hp) Motor & Motor Housing Assemblies



"OIL–LESS" ROTOR BLADES

"Oil–Less" rotor blades can be assembled in tools at extra cost, as follows.

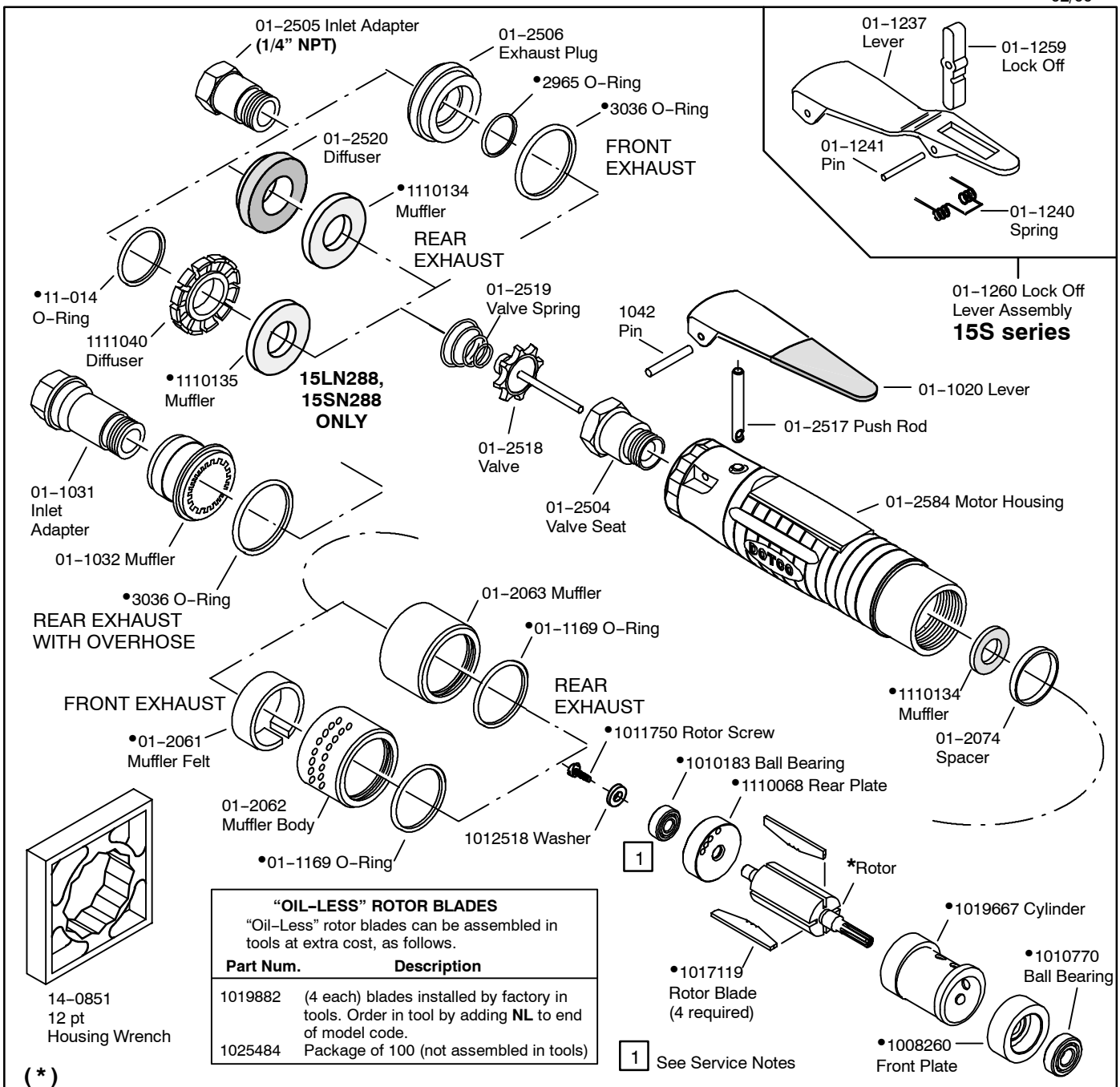
Part Num.	Description
1019724	(4 each) blades installed by factory in tools. Order in tool by adding **NL** to end of model code.
1025413	Package of 100 (not assembled in tools)

(*)

PART NAME	15LS251 15LS281	15LS252 15LS282	15LS253 15LS283	15LS254 15LS284	15LS255 15LS285	15LS256 15LS286	15LS257 15LS287
rpm: TERM. 50 series TERM. 40, 60, 70, 90 ser.	3800 5430	2360 3370	1410 2010	1160 1660	950 1360	590 840	350 500
Rotor (num. teeth)	1012811 —	1012769 (9T)	1012812 (5T)	1012812 (5T)	102811 —	1012769 (9T)	1012812 (5T)
Motor Assembly (complete)	1025561	1025565	1025566	1025566	1025561	1025565	1025566
Pinion	1021745	—	—	—	1021745	—	—
Retaining Ring	1007548	—	—	—	1007548	—	—

(T) Teeth • Zähne • Dents • Dientes • Denti

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.



"OIL–LESS" ROTOR BLADES

"Oil–Less" rotor blades can be assembled in tools at extra cost, as follows.

Part Num.	Description
1019882	(4 each) blades installed by factory in tools. Order in tool by adding **NL** to end of model code.
1025484	Package of 100 (not assembled in tools)

(*)

PART NAME	15LN251 15LN281	15LN252 15LN282	15LN253 15LN283	15LN254 15LN284	15LN255 15LN285	15LN256 15LN286	15LN257 15LN287	15LN258 15LN288
rpm: TERM. 50 series TERM. 40, 60, 70, 90 ser.	3500 5000	2170 3100	1300 1850	1070 1530	870 —	540 —	320 —	4200 6000
Rotor (num. teeth)	1017218 —	1017156 (9T)	1017184 (5T)	1017184 (5T)	107218 —	1017156 (9T)	1017184 (5T)	1017218 —
Motor Assembly (complete)	1025570	1025571	1025572	1025572	1025570	1025571	1025572	1025639
Pinion	1021745	—	—	—	1021745	—	—	1017625
Retaining Ring	1007548	—	—	—	1007548	—	—	1007548

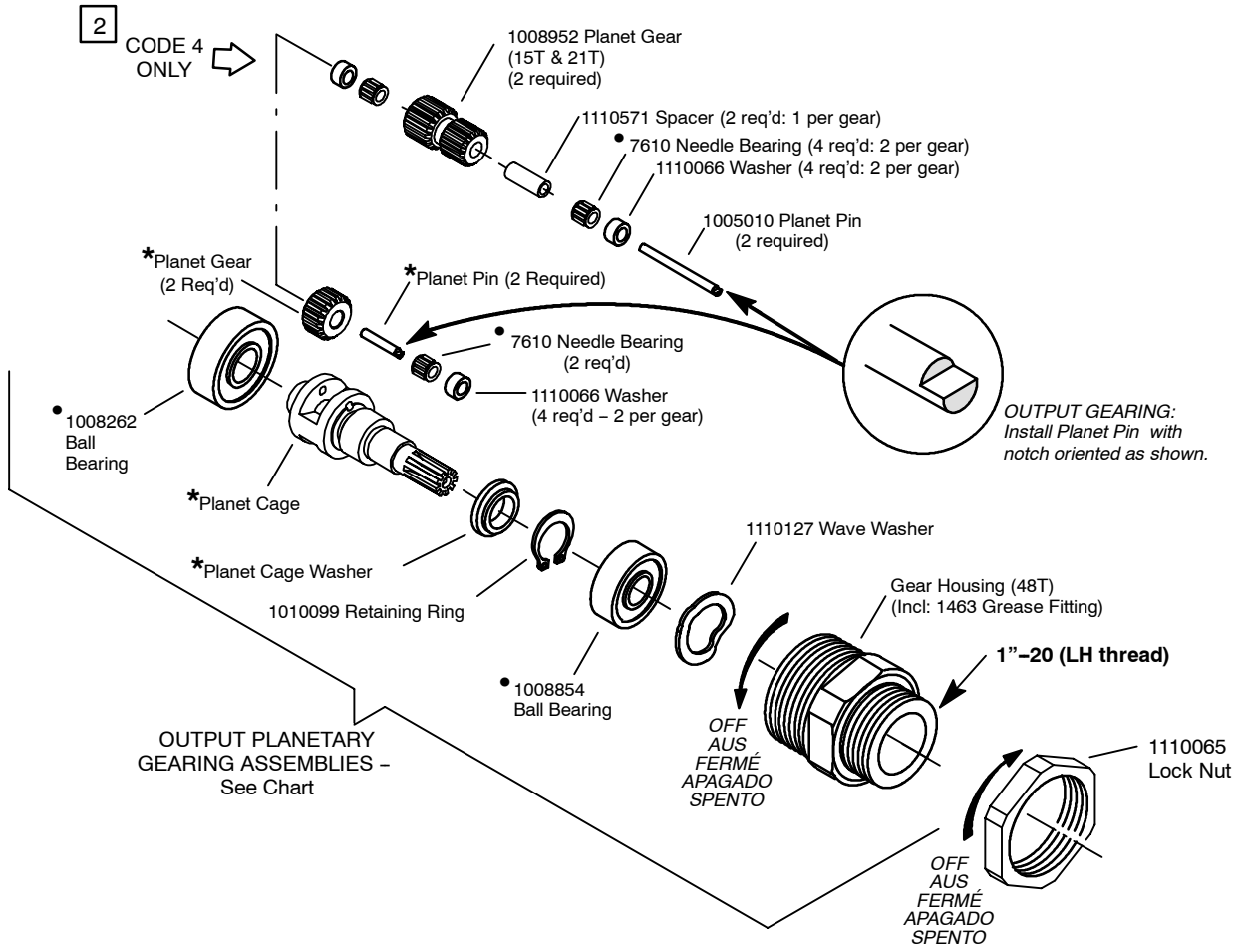
(T) Teeth • Zähne • Dents • Dientes • Denti

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

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Model 15LN & 15LS Angle Drills
Planetary Gearing

Single Stage Gearing



(*)

Part Name / Speed Code:	MODEL: 15LN251 15LN281 15LS251 15LS281	15LN252 15LN282 15LS252 15LS282	15LN253 15LN283 15LS253 15LS283	15LN254 15LN284 15LS254 15LS284
	1	**2**	**3**	**4**
GEAR ASSEMBLY (Complete)	1025934	1025655	1025656	1025657
Pl. Cage Washer (diameter):	1110069 (0.743")	1110070 (0.677")	1110071 (0.636")	1110071 (0.636")
Gear Housing (num. teeth)	1110040 (48T)	1110042 (49T)	1110042 (49T)	1110063 (43T)
Planet Cage	1110228	1110229	1110231	1110226
Planet Gears (2 ea.) (num. teeth)	1008250 (16T)	1008252 (19T)	1110139 (21T)	1008952 (21T/15T)
Planet Pins (2 req'd)	1004983	1004983	1004983	1005010

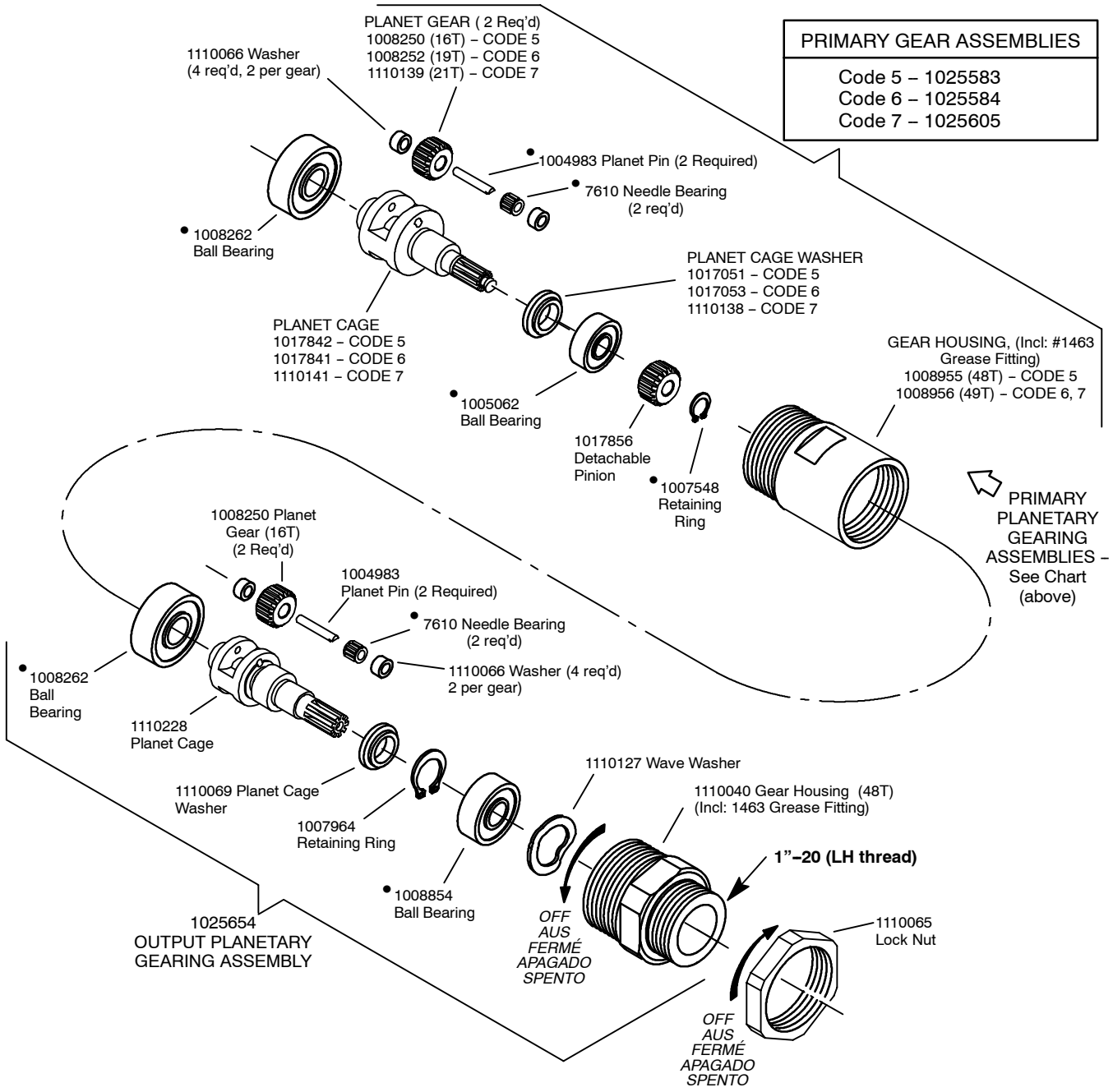
2 See Service Notes

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

DOTCO

Model 15LN & 15LS Angle Drills
Planetary Gearing

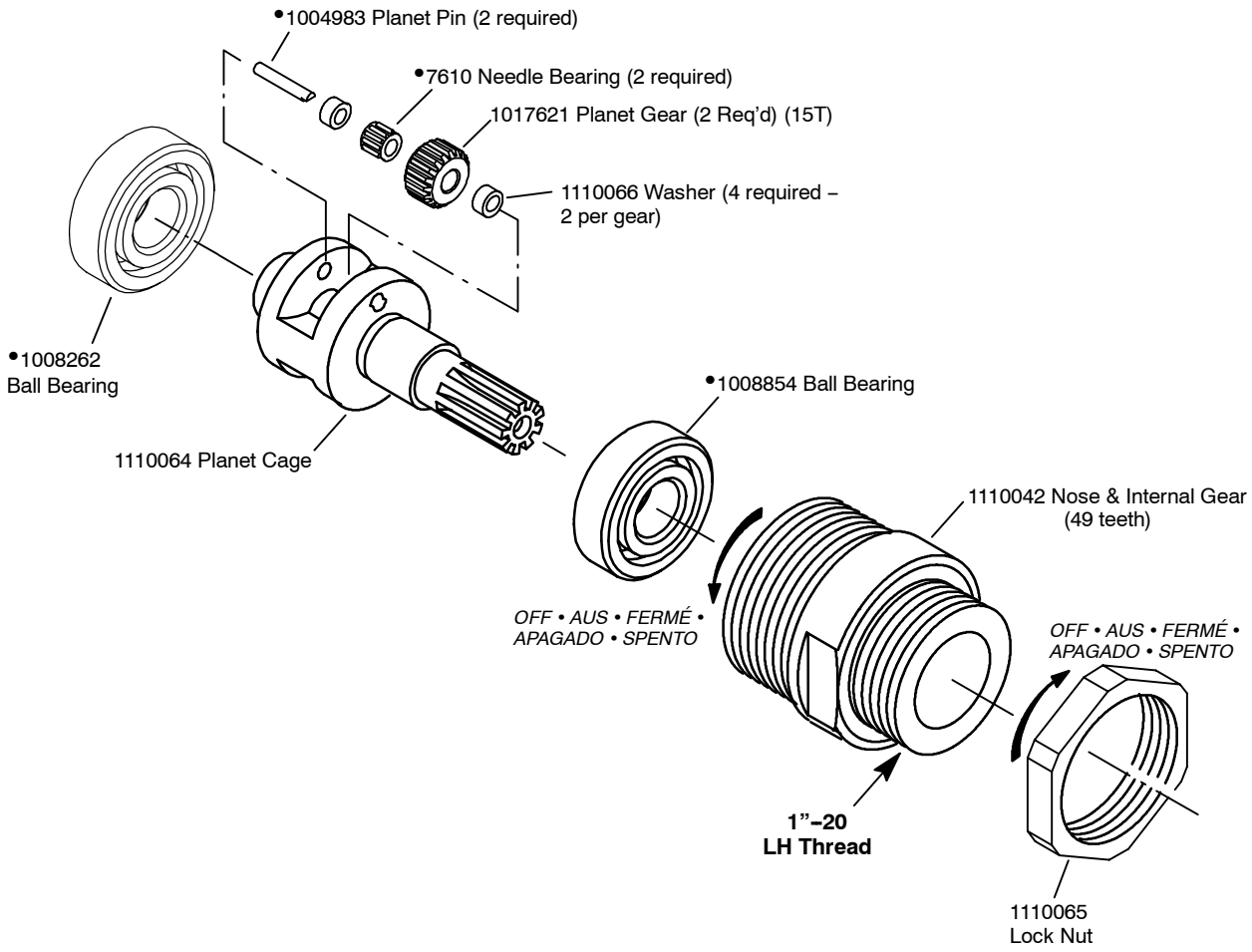
Double Stage Gearing



(•) Indicates recommended spare part.
Order one (1) or one set for every 6–10 tools.
Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

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Model 15LN288 (0.9hp) Angle Drill
4200 or 6000 RPM Planetary Gearing

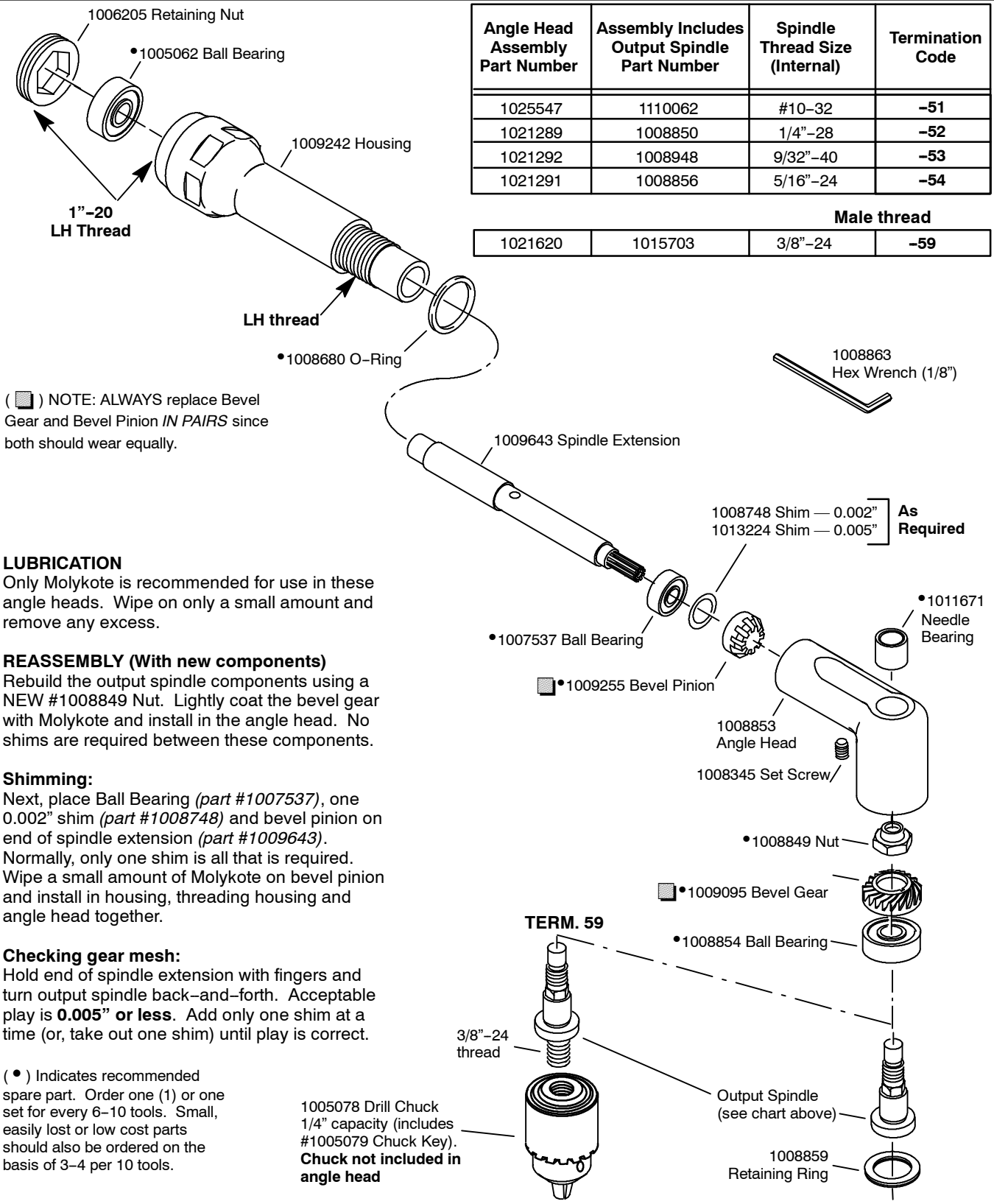


(•) Indicates recommended spare part. Order one (1) or one set for every 6−10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3−4 per 10 tools.

DOTCO

Models 15LS & 15LN Angle Drills
90º Heavy Duty Angle Head

Angle Head Assembly Part Number	Assembly Includes Output Spindle Part Number	Spindle Thread Size (Internal)	Termination Code
1025547	1110062	#10–32	**–51**
1021289	1008850	1/4"–28	**–52**
1021292	1008948	9/32"–40	**–53**
1021291	1008856	5/16"–24	**–54**
			Male thread
1021620	1015703	3/8"–24	**–59**



(▩) NOTE: ALWAYS replace Bevel Gear and Bevel Pinion *IN PAIRS* since both should wear equally.

LUBRICATION
Only Molykote is recommended for use in these angle heads. Wipe on only a small amount and remove any excess.

REASSEMBLY (With new components)
Rebuild the output spindle components using a NEW #1008849 Nut. Lightly coat the bevel gear with Molykote and install in the angle head. No shims are required between these components.

Shimming:
Next, place Ball Bearing *(part #1007537)*, one 0.002" shim *(part #1008748)* and bevel pinion on end of spindle extension *(part #1009643)*. Normally, only one shim is all that is required. Wipe a small amount of Molykote on bevel pinion and install in housing, threading housing and angle head together.

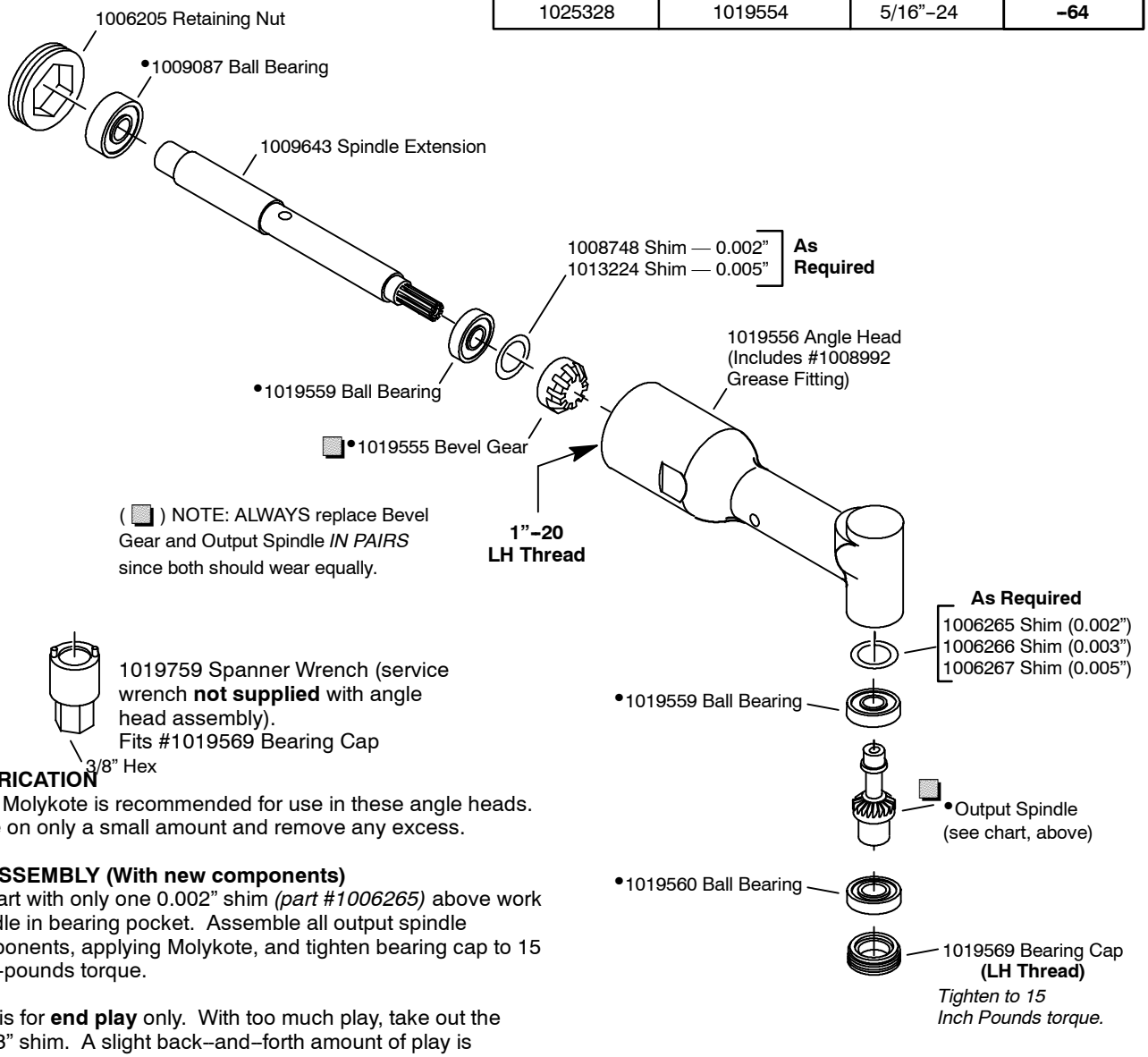
Checking gear mesh:
Hold end of spindle extension with fingers and turn output spindle back–and–forth. Acceptable play is **0.005" or less**. Add only one shim at a time (or, take out one shim) until play is correct.

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

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Models 15LS & 15LN Angle Drills
90º Miniature Angle Heads

Angle Head Assembly Part Number	Assembly Includes Output Spindle Part Number	Spindle Thread Size (Internal)	Termination Code
1025314	1019553	#10–32	**–61**
1025409	1019551	1/4"–28	**–62**
1025313	1019552	9/32"–40	**–63**
1025328	1019554	5/16"–24	**–64**



LUBRICATION
Only Molykote is recommended for use in these angle heads. Wipe on only a small amount and remove any excess.

REASSEMBLY (With new components)
1. Start with only one 0.002" shim *(part #1006265)* above work spindle in bearing pocket. Assemble all output spindle components, applying Molykote, and tighten bearing cap to 15 inch–pounds torque.

This is for **end play** only. With too much play, take out the 0.003" shim. A slight back–and–forth amount of play is acceptable and necessary.

2. Assemble all remaining components and check gear "shake". This is for **gear mesh** which should be no more than 0.005".

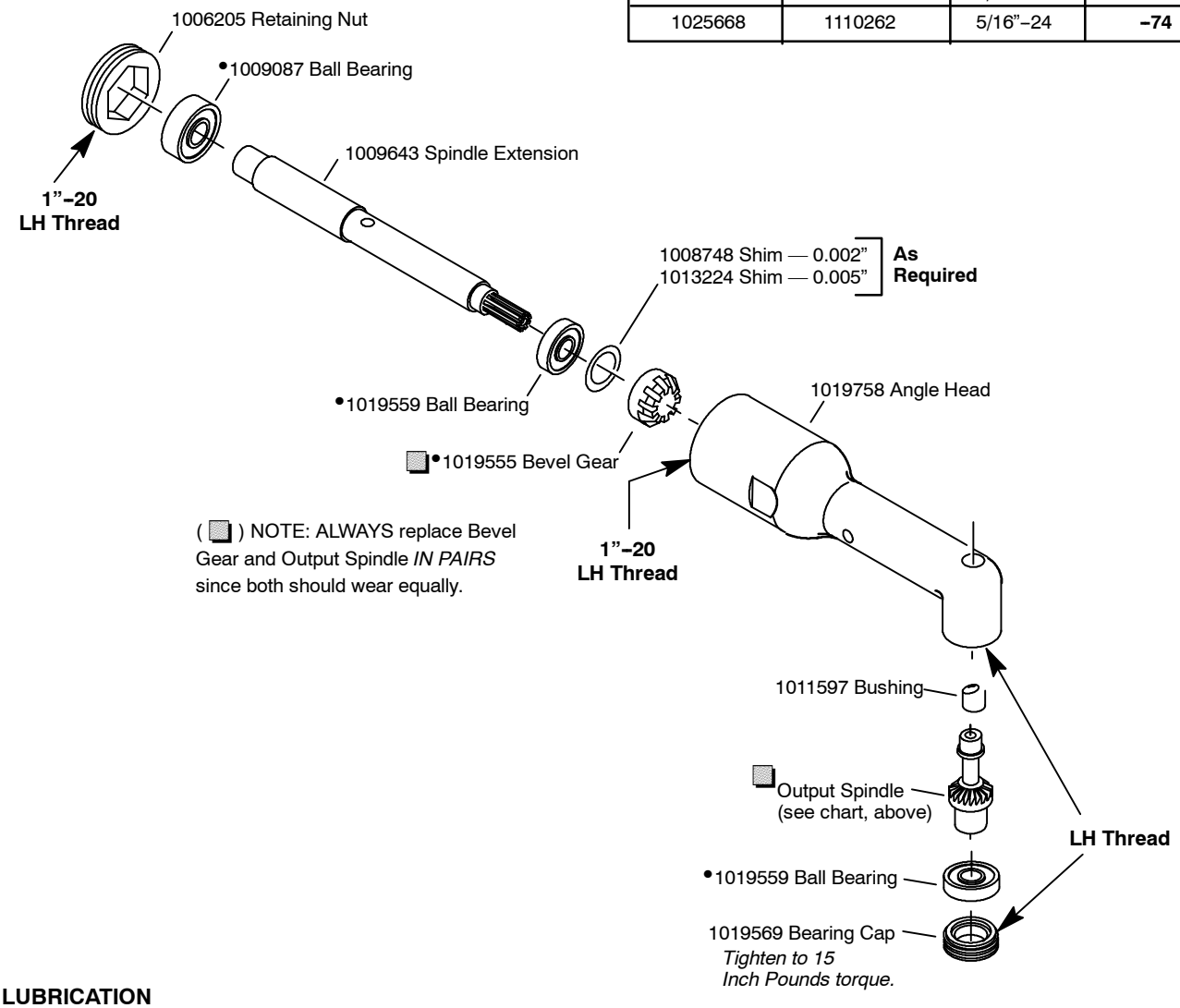
3. Be sure to apply Molykote before assembly.

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

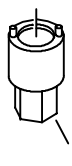
DOTCO

Models 15LS & 15LN Angle Drills
90º Compact Angle Heads

Angle Head Assembly Part Number	Assembly Includes Output Spindle Part Number	Spindle Thread Size (Internal)	Termination Code
1025667	1110261	#10–32	**–71**
1025477	1019879	1/4"–28	**–72**
1025476	1019880	9/32"–40	**–73**
1025668	1110262	5/16"–24	**–74**



LUBRICATION
Only Molykote is recommended for use in BUCKEYE angle heads. Wipe on only a small amount and remove any excess.



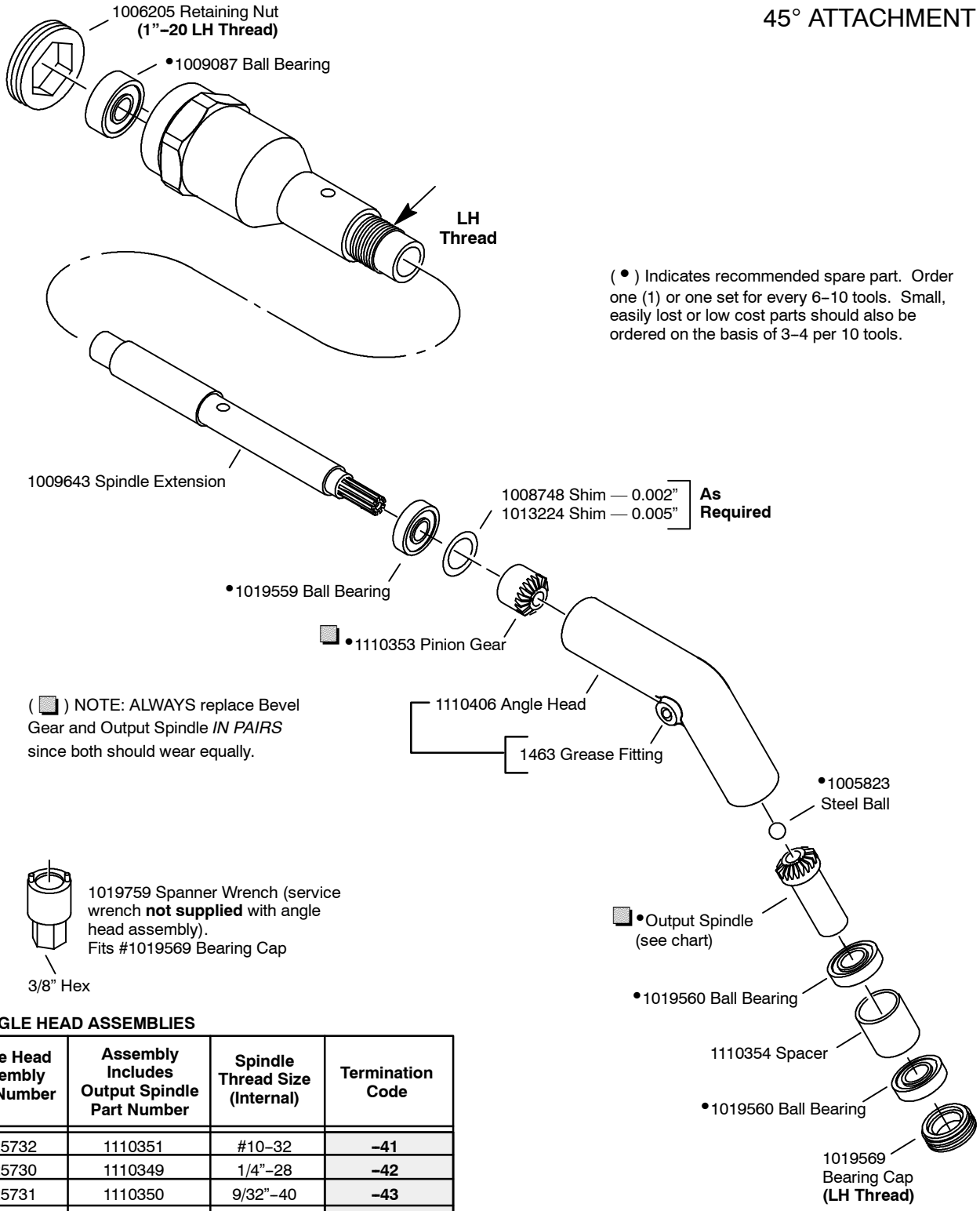
1019759 Spanner Wrench (service wrench **not supplied** with angle head assembly).
Fits #1019569 Bearing Cap

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

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Models 15LS & 15LN Angle Drills
45º Mini Angle Heads

45° ATTACHMENT



(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

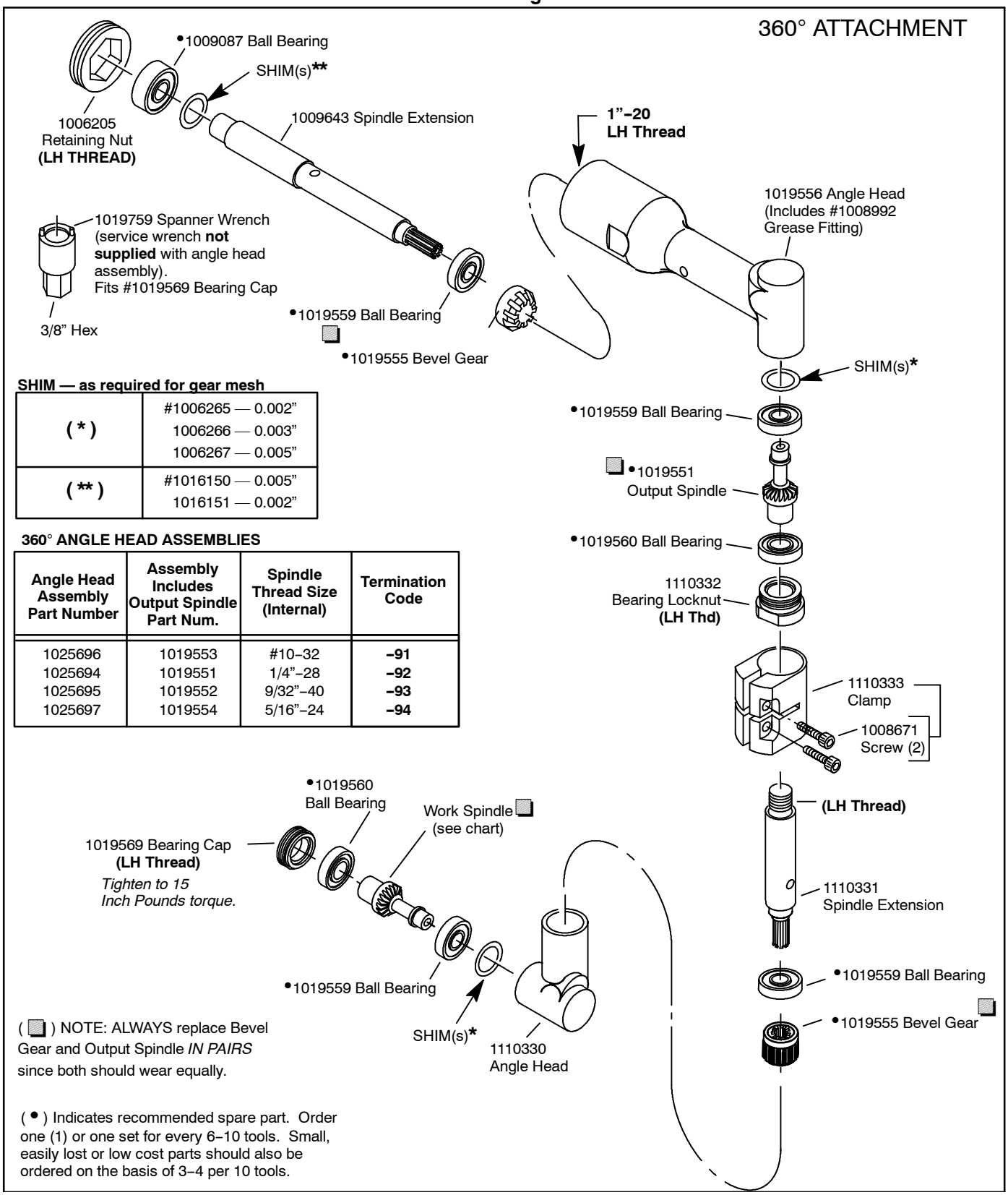
(■) NOTE: ALWAYS replace Bevel Gear and Output Spindle *IN PAIRS* since both should wear equally.

45° ANGLE HEAD ASSEMBLIES

Angle Head Assembly Part Number	Assembly Includes Output Spindle Part Number	Spindle Thread Size (Internal)	Termination Code
1025732	1110351	#10–32	**–41**
1025730	1110349	1/4"–28	**–42**
1025731	1110350	9/32"–40	**–43**
1025733	1110352	5/16"–24	**–44**

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Models 15LS & 15LN Angle Drills
360º Mini Angle Heads



SHIM — as required for gear mesh

(*)	#1006265 — 0.002" 1006266 — 0.003" 1006267 — 0.005"
(**)	#1016150 — 0.005" 1016151 — 0.002"

360° ANGLE HEAD ASSEMBLIES

Angle Head Assembly Part Number	Assembly Includes Output Spindle Part Num.	Spindle Thread Size (Internal)	Termination Code
1025696	1019553	#10–32	**–91**
1025694	1019551	1/4"–28	**–92**
1025695	1019552	9/32"–40	**–93**
1025697	1019554	5/16"–24	**–94**

(■) NOTE: ALWAYS replace Bevel Gear and Output Spindle *IN PAIRS* since both should wear equally.

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.