Parts Manual
45-8195
PL31-1514-1
04/21/2011

DOTCO®

15-14 Series
Right Angle Drills



15	X	1	4	XX	-	XX	XX

Product Classification
15 = Drill

Trottle Type
L = Locking Lever
S = Locking Lever

Motor Size
1 = 0.3 hp

Handle Style
4 = Right Angle

Speed Options (RPM)
Rear Exhaust
87 = 1,500
88 = 2,400
89 = 3,600
90 = 800
91 = 500

Termination Code
31 = #10-32 Internal Thread Spindle
32 = 1/4-28 Internal Thread Spindle
34 = 5/16-24 Internal Thread Spindle
35 = 3/8-24 Internal Thread Spindle
36 = 300 Series 1/4" Capacity Collet Chuck
37 = 0-5/32" Capacity Drill Chuck (# 0B)
38 = 0-1/4" Capacity Drill Chuck (# 1B)
40 = 3/8-24 Ext. Thread Spindle (no chuck)
45 = Universal 1/4" Capacity Collet Chuck
51 = 1/16"-3/8" Capacity Drill Chuck (# 31BA)

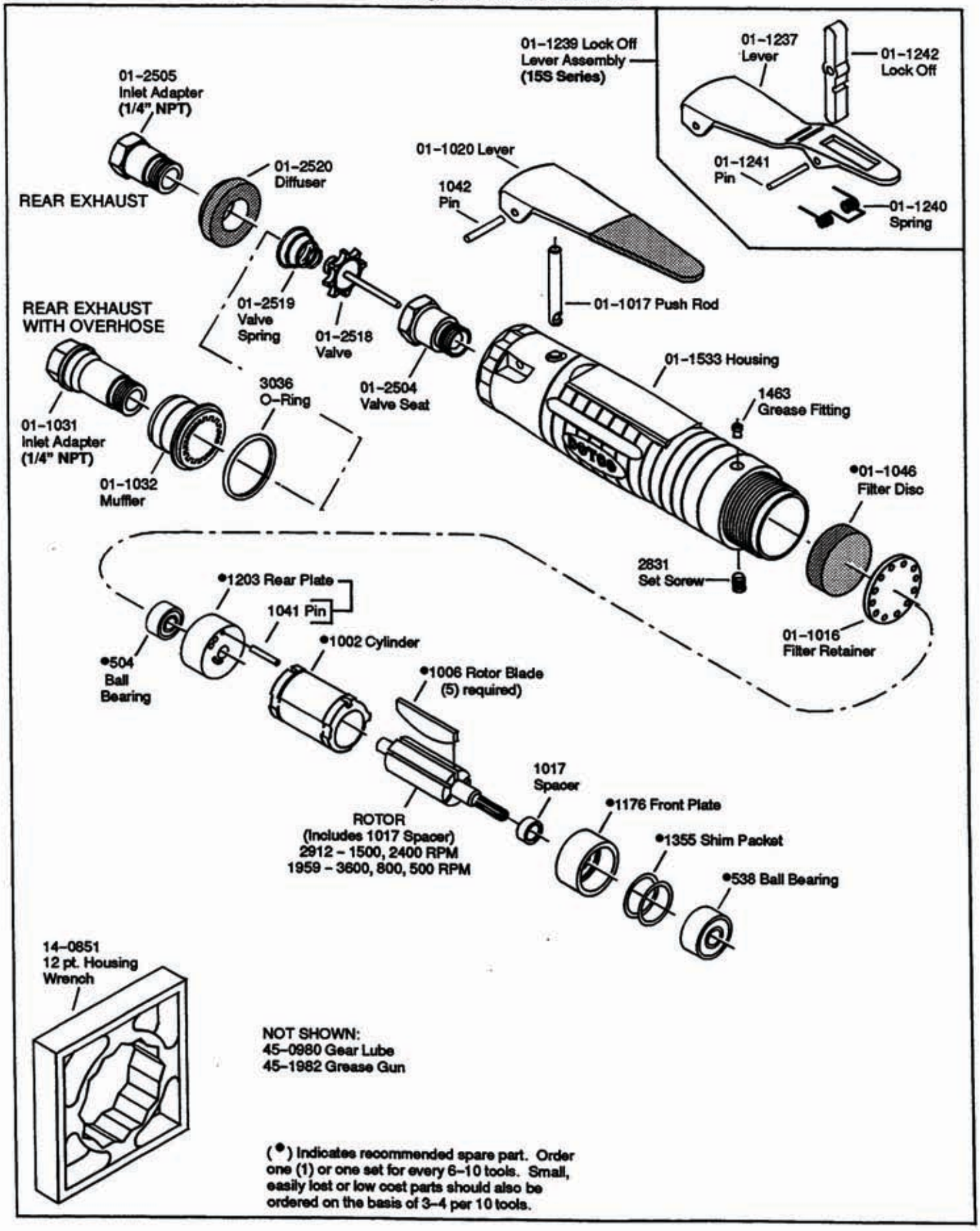
Overhose Option (extra cost)
OH = Overhose (rear exhaust models only)

For additional product information visit our website at http://www.apextoolgroup.com

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Models 15–14 Angle Drills

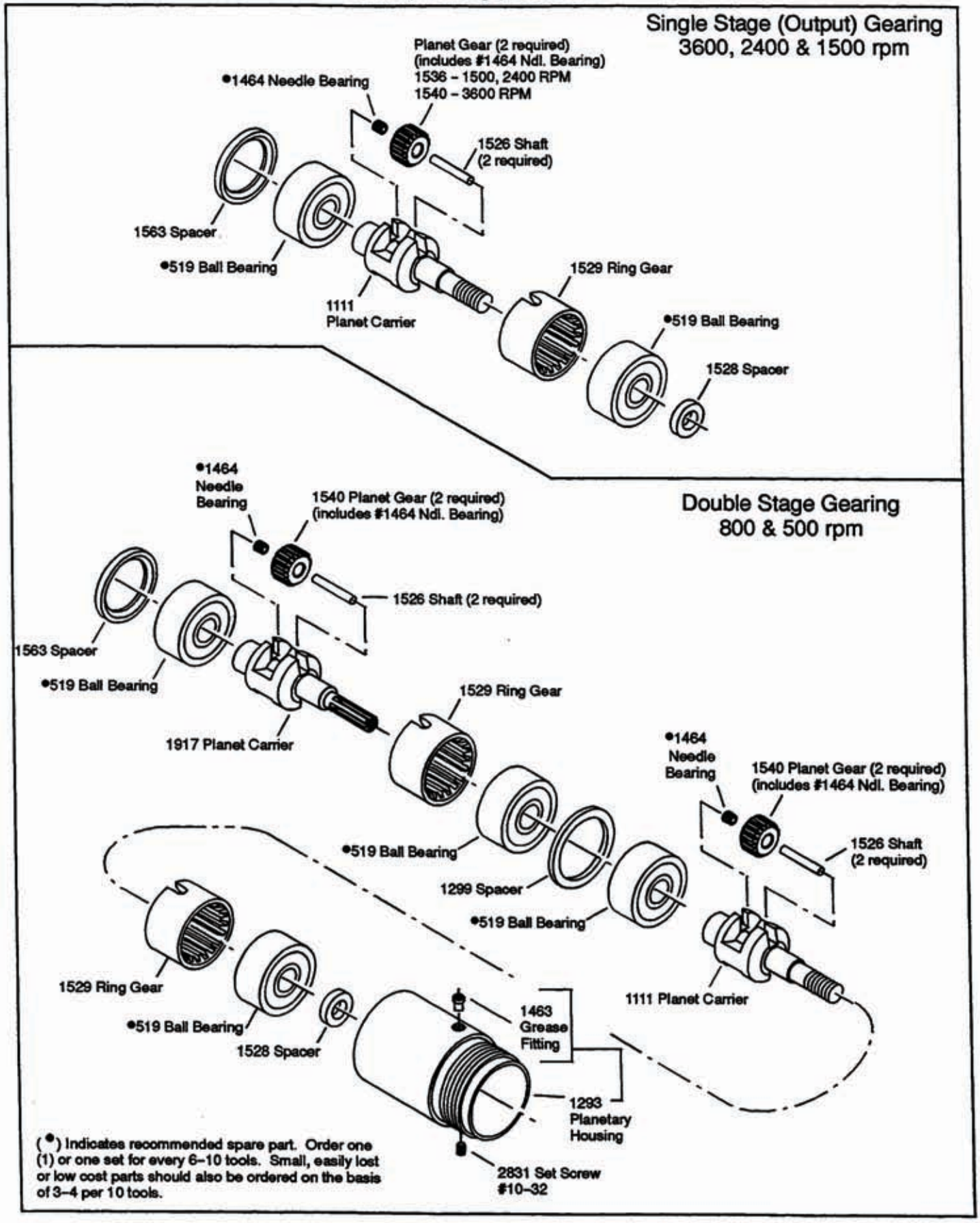
Housings and Motor Assemblies



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Models 15–14 Angle Drills

Planetary Gearing Assemblies

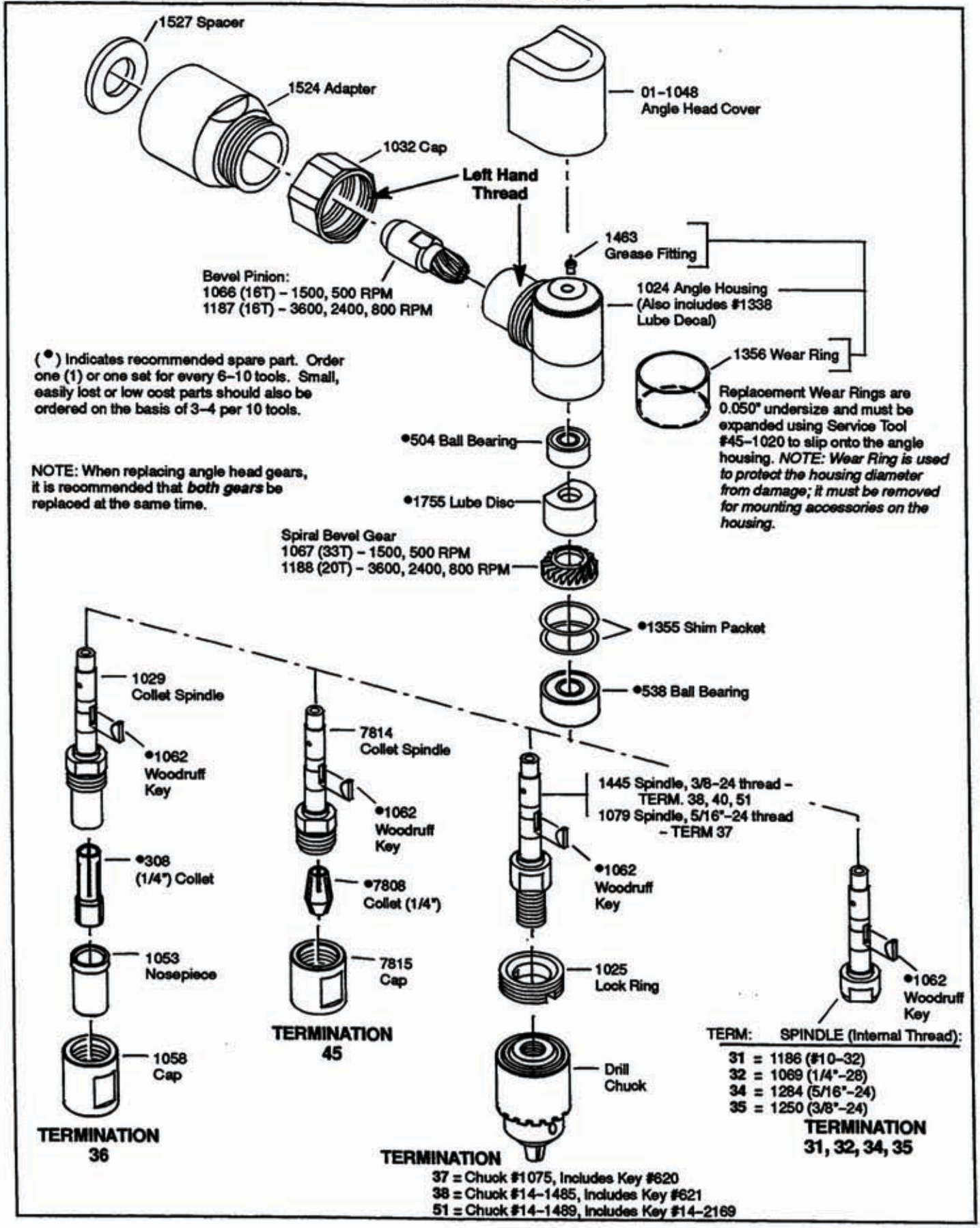


(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

DOTCO®

Models 15–14 Angle Drills

Angle Head Assembly



INSTALLATION

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

The motor must be lubricated and free of moisture. Use a high grade SAE spindle oil, such as Cooper's Lubricating Oil #45-0918 *(one quart)*. Two or three drops per minute should be sufficient.

LOSS OF POWER

It is seldom necessary to disassemble this tool to correct for a loss of power. A loss of power may not be related to the tool. First, check air line pressure. It should be ***90 psi at or near the tool while operating***.

SERVICE INSTRUCTIONS

Do not squeeze tool or parts in a vise except as specified. Care must be used in their assembly and disassembly. When pressing bearings onto a shaft, press only on the inner race. When pressing bearings into a bore, press on the outer race only. NOTE: Ball bearings are the shielded type. They are lubricated for life by the bearing manufacturer and should not be washed out with solvents to clean.

DISASSEMBLY INSTRUCTIONS

TO DISASSEMBLE COMPLETE TOOL —

Place the special 12—point socket wrench, *part #14-0851*, horizontally in a vise and insert the tool's housing vertically into the wrench. Loosen and unscrew Cap *(part #1032); remove angle head assembly.*

To Disassemble Angle Head Assembly –

Remove Lock Ring *(part #1025)* and pull out spindle assembly. To disassemble spindle assembly, first remove Ball bearing *(part #504)* and press off Bevel Gear *(part #1067 or 1188)*. After Woodruff Key *(part #1062)* is removed, Ball Bearing *(part #538)* can be pressed off *(NOTE: gear and key must be pressed off before #534 can be pressed off.*

To Remove Planetary Gearing and Motor from Tools –

Unthread Lock Screw *(part #2831)* from Motor Housing *(part #01-1533)* and/or Planetary Housing*(part #1293)*. Unthread Planetary Housing from Motor Housing. Unthread Adapter *(part #1524)* from Planetary Housing *(part #1293)*. Pull out Planetary Gearing Assemblies. Motor is free to slide out of housing. If motor sticks or does not slide out freely, tap rear or front of housing with a plastic mallet or hardwood block.

To Disassemble Planetary Gearing –

Holding planetary assembly in one hand, remove (rear) Ball bearing *(part #519)* by tapping rear end of Planet Carrier with a drive punch. NOTE: Punch must be sufficiently large to prevent entry into the open end of the planet carrier. To remove Bevel Pinion, hold Planet Carrier across solid sides in smooth vise jaws and unthread pinion, being sure that carrier does not turn in vise. Use arbor press to press off front Ball Bearing *(part #519)*.

Press Shafts *(part #1526)* out of planet carrier, pressing on shafts only from the front end of carrier..

NOTE: Normally, Needle Bearings *(part #1464)* will last the life time of the Planet Gears *(replacement gears have needle bearings already pressed in)*. When replacing needle bearings in planet gears, pusher rod MUST be 0.249", minus 0.005", in diameter. To install new needle bearings in planet gears, press ONLY on the TRADEMARK END of the bearings.

To Disassemble Motor –

Remove Rear Plate *(part #1203)* with Bearing *(part #504)*by holding motor in one hand and tapping on rear of rotor with a brass drive punch. The Front Plate *(part #1176)* with Bearing *(part #538)* can now be pressed off (be careful not to lose Spacer, *part #1017*).

ASSEMBLY INSTRUCTIONS

TO ASSEMBLE COMPLETE TOOL —
(All parts, except bearings, should be thoroughly cleaned, inspected and lightly oiled before assembly)

To assemble Motor –

1. To correct for bearing tolerances, it is necessary to use shims to maintain correct clearance between ends of rotor and bearing plates. Shim Packet *(part #1355)* contains one 0.001" shim and one 0.002" shim. Insert the 0.002" shim in Front Plate *(part #1176)* pocket. Insert Ball Bearing *(part #538)* into front plate. Assemble Spacer *(part #1017)* onto pinion end of rotor. Assemble front plate onto rotor by pressing on inner race of bearing and by supporting rotor on opposite end.

Be sure that bearing is pressed tight against spacer. Now, hold Rotor in one hand and bearing plate in the other hand. Apply an outward (pulling) pressure and observe spacing between end of rotor and bearing plate. This should be from flush, not rubbing, to 0.002" maximum. If the rotor rubs the bearing plate, reduce the spacing between the bearing and bearing plate by removing the 0.002" shim entirely, or by substituting the 0.001" shim for the 0.002" shim. However, if there is more than 0.002" spacing between the end of the rotor and bearing plate, add a 0.001" shim between the bearing and bearing plate.

ASSEMBLY INSTRUCTIONS

(continued)

2. Assemble Cylinder *(part #1002)* so that inlet port will align with inlet holes in Rear Plate *(part #1203)*. Insert all five Rotor Blades *(part #1006)* into rotor slots.

3. Support this assembly squarely on the pinion end of the rotor. Place Ball Bearing *(part #504)* into Rear Plate *(part #1203)* and press onto rotor, pressing only on inner race of ball bearing – just enough to bring the rear plate against the cylinder. There should be a slight drag between the front and rear plates and the cylinder when these are moved with the fingers. Position cylinder until motor turns finger-free.

To Assemble Motor in Housing –

4. Be sure that Lock Screw *(part #2831)* has been removed from motor housing. Insert motor into housing. Insert Spacer *(part #1563)* with unrelieved face towards Front Plate *(part #1176)*.

To Assemble Planetary Assembly –

5. Press shafts into planet carrier and gears until end of shaft is flush with carrier's face. Press Ball Bearing *(part #519)* onto front end of carrier until it seats. Place Spacer *(part #1528)* on carrier. To replace pinion, hold large diameter of carrier in soft vise jaws and thread on pinion. Replace Ring Gear *(part #1529)* — notch is to face *rear* end of carrier. Press bearing onto rear of planet carrier until there is only a slight drag between Ring Gear *(part #1529)* and the two bearings.

To Replace Planetary Assembly in Housing –

6. Insert planetary assembly into motor housing and/or Planetary Housing *(part #1293)*, keeping notches in ring gear lined up with threaded hole for lock screw. Thread Lock Screw *(part #2831)* into motor housing and/or Planetary Housing. Turn screw down until snug, then back off 1/2 turn. Place Spacer *(part #1527)* in Adapter *(part #1524)* with relieved face towards planetary gear assembly. Thread adapter onto motor housing.

To Assemble Angle Head –

7. Press Ball Bearing *(part #538)* onto Spindle, pressing only on bearing's inner race. Insert Woodruff Key *(part #1062)* in slot in spindle; align keyway of Bevel gear with key and press gear onto spindle until it seats on inner race of bearing. Place Lube Disc *(part #1755)* onto spindle.

8. Complete shaft assembly by pressing Ball Bearing *(part #504)* until it seats on shaft shoulder. Insert spindle assembly into housing and complete the assembly by threading Lock Ring *(part #1025)* until tight.

To Assemble Angle Head Assembly onto Housing –

9. Thread Cap *(part #1032)* onto angle head assembly so that it covers the threads. Then, thread the cap and angle head assembly onto the Adapter *(part #1524)* on the motor assembly, revolving the angle head assembly with the cap. Make sure that the teeth of the motor pinion mesh with the gear by revolving the angle head's spindle slowly while screwing on the cap. Before tightening the cap, position the angle head in the desired position and hold both housings while tightening the cap. There must be a small gap between the cap and the shoulder of the Adapter *(part #1524)*. It may be necessary to revolve the angle head another turn to accomplish this (LH thread).

PRE-OPERATION INSPECTION

Before tool is connected to the air line, be sure spindle turns freely. Tools should not be operated if there is any rubbing or binding in the assembly. Add a few drops of oil to tool's air inlet before testing.

RECOMMENDED SPARE PARTS LIST

These parts are suggested as a recommended inventory of spare parts. Where parts are small, low cost, or easily lost, then we recommend stocking 3 to 4 for every 10 tools. Other larger, lower wear or more expensive parts should be maintained as one (or one set) for every six to ten tools.

Part Number	Description	Qty Per Tool	Recommended Spare Pts	
			Per Tool	Per 10 Tools
504	Ball Bearing	2	2	4
519	Ball Brng (single stage) Ball Bearing (dbl stage)	2 4	2 4	4 8
538	Ball Bearing	2	2	4
1002	Cylinder	1	—	2
1006	Rotor Blade	5	5	25
01-1046	Air Filter	1	1	2

Part Number	Description	Qty Per Tool	Recommended Spare Pts	
			Per Tool	Per 10 Tools
1062	Woodruff Key	1	2-3	3-4
1176	Front Plate	1	0	2
1203	Rear Plate	1	0	2
1355	Shim Packet	2	2	4
1464	Ndl Brng (single stage) Ndl Bearing (dbl stage)	2 4	2 4	4 8
1755	Lube Disc	1	1	2
var.	Collet (see Termination)	1	1	2

Sales & Service Centers

Note: All locations may not service all products. Please contact the nearest Sales & Service Center for the appropriate facility to handle your service requirements.

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