

Pilot Bit Application Chart

Ballantine, Inc. offers a full line of Professional Contractor Series HDD Pilot Bits that, when matched correctly to the specific application, will maximize your drill rig's production capabilities. All of our bits are constructed of premium abrasion resistant alloy steels. Many of these bits feature our robotically applied Terminator® weave tungsten carbide-mesh hardfacing which has proven to extend tool life up to 30% longer than competitors' hardfacing.

	Soil type	Sandy	Light	Medium	Hard	Rocky	Soft Rock	Medium Rock	Hard Rock
B I T S T Y L E	Duckbill Hardfaced	1	1	2	3	4	5	5	5
	Steep Taper Hardfaced	5	3	2	1	1	3	5	5
	Carbide Claw	3	2	1	1	4	4	5	5
	Dura Bit	2	2	1	2	4	5	5	5
	Chevron	3	2	1	1	4	5	5	5
	Continual Radius	3	2	1	1	3	4	5	5
	Tough Bit	4	2	1	1	2	2	4	5
	Power Tip	3	2	2	1	3	2	4	5
	Bear Claw	3	4	2	1	2	2	3	5
	Incredibit Standard	3	2	2	1	2	1	3	5
	Incredibit Aggressive	3	2	2	1	2	1	3	5
	Direct Bore I	3	2	2	3	2	1	4	5
	Direct Bore II	3	1	2	3	3	4	5	5
	Direct Bore III	3	2	2	1	1	3	5	5

1 = Best

2 = Good

3 = Fair

4 = Less Recommended

5 = Not Recommended

Soil Type Definitions:

Sandy Loose Sand, Sandy Loam or any soil that is predominately comprised of sand

Light Loams, Clay, Silt, Soft to medium soils that contain moisture

Medium Consolidated Loams & Clays, Semi-compacted soils

Hard Hardpan, Gumbo, Compacted Soils

Rocky Cobble, Chunk Rock, Gravel, Glacial Till (any non-consistent type of rock)

Soft Rock Chert, Slate, Soft Limestone, Sandstone, Shales, Certain Corral (0-9,000 psi)

Medium Rock Certain Limestone, Sandstone, Some Dolomite, Shales, Coral, (9,000-16,000 psi)

Hard Rock Hard Limestone, Granite, Schist, Trap Rock, Quartzite (Above 16,000 psi)

* The above chart is designed as a reference guide only. Soil conditions often vary throughout a pilot bore which may affect actual performance in the field. Contact your local Ballantine, Inc. dealer or Ballantine direct for specific recommendations regarding soil conditions and pilot bit selection.

HDD Pilot Bit Part Number Identification Chart

Part Numbering Example

Pilot Bit Description: Ditch Witch, 5/8" Thick, 5 Hole, Duckbill Hardfaced, 4" Wide Cut

Part Number Example: **D 5 5 DH 40 ***

1st Position	2nd Position	3rd Position	4th Position	5th Position	6th Position*
Drill Manufacturer	Bit Thickness	Hole Pattern	Type of Bit - Description	Width of Cut	Length Designation
V = Vermeer®	5 = 5/8"	4 = 4 Hole	DH = Duckbill Hardfaced ST = Steep Taper	30 = 3"	S = Short 10 3/8" Long
D = Ditch Witch®	6 = 3/4"	5 = 5 Hole	CC = Carbide Claw DB = Dura Bit	35 = 3 1/2"	
C = Astec/Case	8 = 1"	6 = 6 Hole	CB = Chevron Bit CR = Continual Radius	40 = 4"	L = Long 11 5/8" Long
A = American Auger	0 = 1 1/4"	7 = 7 Hole	TB = Tough Bit PT = Power Tip SG = Sewer Grade BC = Bear Claw	45 = 4 1/2" 50 = 5" 55 = 5 1/2"	

* The 6 Position is used for Vermeer® pilot bits only. The short designation is for Vermeer® D10X15 and smaller drills. The long designation is for Vermeer® drills between models D16X20 and D40X40.

- Custom Bits Available Upon Request
- One Inch Thick Blades Available for Vermeer®, Upon Request

Pilot Bit Bolts

Drill Rig	Number of Bolt Holes per Bit	Bolt Size	Part No.
Ditch Witch® JT920, JT920L, JT1220, JT1720, JT2020, JT2720*	5	12mm	B107277
DitchWitch® JT2720*, JT4020	6	16mm	B106681
Vermeer® - All Models up to D40x40	7	1/2" - 13"	V129667010

- JT2720 & JT4020 can use multiple beacon housings; refer to # of holes per bit to determine bolt size

Pilot Bit Part Numbers, Features and Benefits

All of Ballantine's Professional Contractors Series (PCS) Pilot Bits are manufactured with the following features. These features provide benefits such as: Extended Wear Life, Increased Production and Improved Steering Capabilities.

- Precision Machined Bodies
- Heavy-Duty Abrasion-Resistant Alloy Steel
- Terminator® Tungsten Carbide Hardfacing
- Complex Three Stage Heat Treat Process
- State-of-the-Art Brazing Process

DUCKBILL HARDFACED

Feature	Benefit
• PCS Body	• Top Performing Tool
• Pullback Hole	• Quick & Easy Product Installation when Backreaming not Required
• Hardfacing Placement	• Positioned in All High Wear Areas for Extended Life

<i>Part No.</i>	<i>Hole Pattern</i>	<i>Width</i>
V67DH30S	Vermeer® 7-Hole	3"
V67DH35S	Vermeer® 7-Hole	3 1/2"
V67DH40S	Vermeer® 7-Hole	4"
V67DH45S	Vermeer® 7-Hole	4 1/2"
V67DH40L	Vermeer® 7-Hole	4"
V67DH45L	Vermeer® 7-Hole	4 1/2"
V67HD50L	Vermeer® 7-Hole	5"
D55DH40	Ditch Witch® 5-Hole	4"
D55DH50	Ditch Witch® 5-Hole	5"
D66DH40	Ditch Witch® 6-Hole	4"
D66DH50	Ditch Witch® 6-Hole	5"
418569A1	Case 7-Hole	5"
418575A1	Case 7-Hole	5"
07703525	Case 3 1/2" Extension	3 1/2"
07704025	Case 4" Extension	4"
07705025	Case 5" Extension	5"



STEEP TAPER HARDFACED

Feature	Benefit
• PCS Body	• Top Performing Tool
• Arrowhead Design	• Ability to Burrow in Tough Cobble & Light Rock Conditions
• Hardfacing Placement	• Positioned in All High Wear Areas for Extended Life

<i>Part No.</i>	<i>Hole Pattern</i>	<i>Width</i>
V67ST40	Vermeer® 7 Hole	4"
V67ST50	Vermeer® 7 Hole	5"
D55ST40	Ditch Witch® 5 Hole	4"
D55ST50	Ditch Witch® 5 Hole	5"
D66ST40	Ditch Witch® 6 Hole	4"



Pilot Bit Part Numbers, Features and Benefits

CARBIDE CLAW

Feature

- PCS Body
- Claw Design
- Hardfacing Placement

Benefit

- Top Performing Tool
- Quick Penetration in Clays & Sand without Balling Up or Plugging of Bit
- Positioned on Claws and All High Wear Areas for Extended Life

Part No.	Hole Pattern	Width
V67CC40	Vermeer® 7 Hole	4"
V67CC45	Vermeer® 7 Hole	4 1/2"
V67CC50	Vermeer® 7 Hole	5"
D55CC40	Ditch Witch® 5 Hole	4"
D55CC45	Ditch Witch® 5 Hole	4 1/2"
D55CC50	Ditch Witch® 5 Hole	5"
D66CC50	Ditch Witch® 6 Hole	5"



DURA BIT

Feature

- PCS Body
- Unibody Design
- Premium Grade Tungsten Carbide
- Individual Indexed Pockets
- Dual Point Center Cutter
- Center Dirt Relief
- Multiple Carbide Cutting Points
- 7 Degree Relief
- 11 Degree Bevel
- Pullback Hole

Benefit

- Top Performing Tool
- No Weakened Weld point
- Extremely Durable Cutting Points
- Securely placed Carbide
- Twice the Cutting Action
- Passes Spoils Off Cutting Face
- Increased Production With Consistent Tracking
- Allows Reaming Edge to Pass Spoil Efficiently
- Allows Cutting Head to Effectively Pass & Steer Though Ground Conditions
- Quick & Easy Product Installation when Backreaming is Not Required

Part No.	Hole Pattern	Width
V67DB40	Vermeer® 7 Hole	4"
V67DB50	Vermeer® 7 Hole	5"
D55DB40	Ditch Witch® 5 Hole	4"
D55DB45	Ditch Witch® 5 hole	4 1/2"
D55DB50	Ditch Witch® 5 Hole	5"
D66DB40	Ditch Witch® 6 Hole	4"
D66DB50	Ditch Witch® 6 Hole	5"
418564A1	Case 7 Hole	3 1/2"
418565A1	Case 7 Hole	4"
418567A1	Case 7 Hole	5"



Pilot Bit Part Numbers, Features and Benefits

CHEVRON

- | Feature | Benefit |
|-----------------------------------|---|
| • PCS Body | • Top Performing Tool |
| • Dual Point Center Cutter | • Twice the Cutting Action |
| • Center Dirt Relief | • Passes Spoils Off Cutting Face |
| • Premium Grade Tungsten Carbide | • Extremely Durable Cutting Points |
| • Multiple Carbide Cutting Points | • Increased Production With Consistent Tracking |

Part No.	Hole Pattern	Width
V67CB40	Vermeer® 7 Hole	4"
V67CB45	Vermeer® 7 Hole	4 1/2"
V67CB50	Vermeer® 7 Hole	5"
D55CB40	Ditch Witch® 5 Hole	4"
D55CB50	Ditch Witch® 5 Hole	5"
D66CB50	Ditch Witch® 6 Hole	5"



CONTINUAL RADIUS

- | Feature | Benefit |
|------------------------------|---|
| • PCS Body | • Top Performing Tool |
| • Unibody Design | • No Weakened Weld point |
| • 7 Degree Relief | • Allows Reaming Edge to Pass Spoil Efficiently |
| • 11 Degree Bevel | • Allows Cutting Head to Effectively Pass & Steer Through Ground Conditions |
| • Center Dirt Relief | • Passes Spoils Off Cutting Face |
| • Individual Indexed Pockets | • Securely placed Carbide |
| • Continual Radius Design | • Precise Bore Path tracking |
| • OffSet V-Faced Carbide | • Optimum Cutting Action, Absorbs Additional Impact |
| • Pullback Hole | • Quick & Easy Product Installation when Backreaming is Not Required |

Part No.	Hole Pattern	Width
V67CR40	Vermeer® 7 Hole	4"
V67CR45	Vermeer® 7 Hole	4 1/2"
V67CR50	Vermeer® 7 Hole	5"
D55CR40	Ditch Witch® 5 Hole	4"
D55CR45	Ditch Witch® 5 Hole	4 1/2"
D55CR50	Ditch Witch® 5 Hole	5"
D66CR50	Ditch Witch® 6 Hole	5"
418561A1	Case 7 Hole	3 1/2"
418562A1	Case 7 Hole	4"
418563A1	Case 7 Hole	5"



Pilot Bit Part Numbers, Features and Benefits

TOUGH BIT

Feature

- PCS Body
- OffSet V-Faced Carbide
- Pullback Hole
- Unibody Design

Benefit

- Top Performing Tool
- Optimum Cutting Action, Absorbs Additional Impact
- Quick & Easy Product Installation when Backreaming not Required
- No Weakened Weld Point

Part No.	Hole Pattern	Width
V67TB40	Vermeer® 7 Hole	4"
V67TB45	Vermeer® 7 Hole	4 1/2"
V67TB50	Vermeer® 7 Hole	5"
D55TB40	Ditch Witch® 5 Hole	4"
D55TB45	Ditch Witch® 5 Hole	4 1/2"
D55TB50	Ditch Witch® 5 hole	5"
D66TB50	Ditch Witch® 6 Hole	5"



POWER TIP

Feature

- PCS Body
- Premium Grade Tungsten Carbide
- Press Fit & Brazed Carbide Points
- Available with Additional Carbide Segments

Benefit

- Top Performing Tool
- Extremely Durable Cutting Points
- Exceptionally Secure Carbide Setting
- Extended Body Life and Enhanced Cutting Action

Part No.	Hole Pattern	Width
V67PT40	Vermeer® 7 Hole	4"
V67PT45	Vermeer® 7 Hole	4 1/2"
V67PT50	Vermeer® 7 Hole	5"
D55PT40	Ditch Witch® 5 Hole	4"
D55PT45	Ditch Witch® 5 Hole	4 1/2"
D55PT50	Ditch Witch® 5 Hole	5"
D65PT40	Ditch Witch® 5 Hole	4"
D65PT45	Ditch Witch® 5 Hole	4 1/2"
D65PT50	Ditch Witch® 5 Hole	5"
D66PT40	Ditch Witch® 6 Hole	4"
D66PT45	Ditch Witch® 6 Hole	4 1/2"
D66PT50	Ditch Witch® 6 Hole	5"



Pilot Bit Part Numbers, Features and Benefits

BEAR CLAW

Feature

- PCS Body
- Offset Conical Carbide Teeth
- Angled Conical Carbide Teeth
- Impregated Carbide Hardfacing
- Unibody Design

Benefit

- Top Performing Tool / Abrasion & Impact Resistant
- Full Coverage Cutting Action / Optimum Bore Path Tracking
- Improved Impact Resistant Teeth / Bores thru the hardest Soils
- Extended Wear Life in High Wear Areas
- Additional Strength - No Weakened Weld Zones

Part No.	Hole Pattern	Width
V67BC40	Vermeer® 7 Hole	4"
V67BC45	Vermeer® 7 Hole	4 1/2"
V67BC50	Vermeer® 7 Hole	5"
D65BC40	Ditch Witch® 5 Hole	4"
D65BC45	Ditch Witch® 5 Hole	4 1/2"
D65BC50	Ditch Witch® 5 Hole	5"
D66BC40	Ditch Witch® 6 Hole	4"
D66BC45	Ditch Witch® 6 Hole	4 1/2"
D66BC50	Ditch Witch® 6 Hole	5"



* Heartland Construction Equipment * (800) 685 2818 * hceweb.com *

ENDURANCE DIRT BITS

ADD "H" INDICATOR TO PART NUMBER FOR PULL BACK HOLE

* ALL INCREDIBIT AND ENDURANCE SOUND HOUSINGS REQUIRE A WATER NOZZLE WHEN USING AN ENDURANCE BIT

FOR 2-3/4" & 3" SONDE HOUSINGS

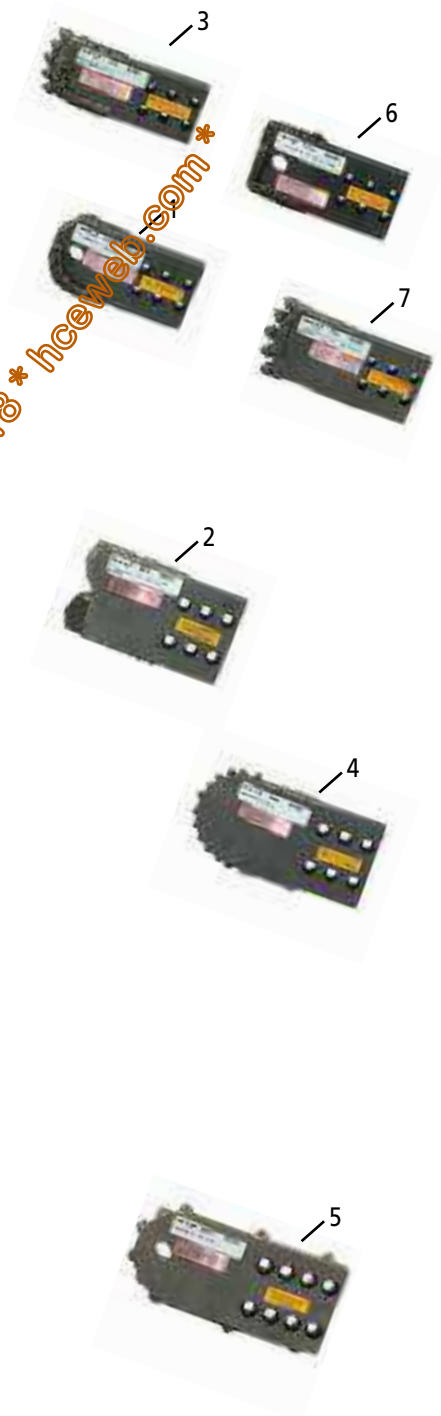
Ref. No.	Part #	Description
	2210	3-1/2" SHARPSHOOTER
1	2211	3-1/2" SILVER BULLET
2	2212	3-1/2" HOLLOW POINT
3	2213	3-1/2" IRON CLAW
	2214	3-1/2" TAPER BIT
4	2215	3-1/2" BUTTON BIT
6	2220	4" SHARPSHOOTER
1	2221	4" SILVER BULLET
2	2222	4" HOLLOW POINT
7	2223	4" IRON CLAW
	2224	4" TAPER BIT
4	2225	4" BUTTON BIT

FOR 3-1/2" SONDE HOUSINGS

Ref. No.	Part #	Description
6	2230	4" SHARPSHOOTER
1	2231	4" SILVER BULLET
2	2232	4" HOLLOW POINT
3	2233	4" IRON CLAW
	2234	4" TAPER BIT
4	2235	4" BUTTON BIT
6	2240	5" SHARPSHOOTER
1	2241	5" SILVER BULLET
2	2242	5" HOLLOW POINT
3	2243	5" IRON CLAW
	2244	5" TAPER BIT
4	2245	5" BUTTON BIT

FOR 4-1/8" SONDE HOUSING

Ref. No.	Part #	Description
6	2250	5" SHARPSHOOTER
3	2253	5" IRON CLAW
5	2255	5" BUTTON BIT
6	2260	* 6" SHARPSHOOTER
3	2263	6" IRON CLAW
5	2265	6" BUTTON BIT



Railhead® Pilot Bits