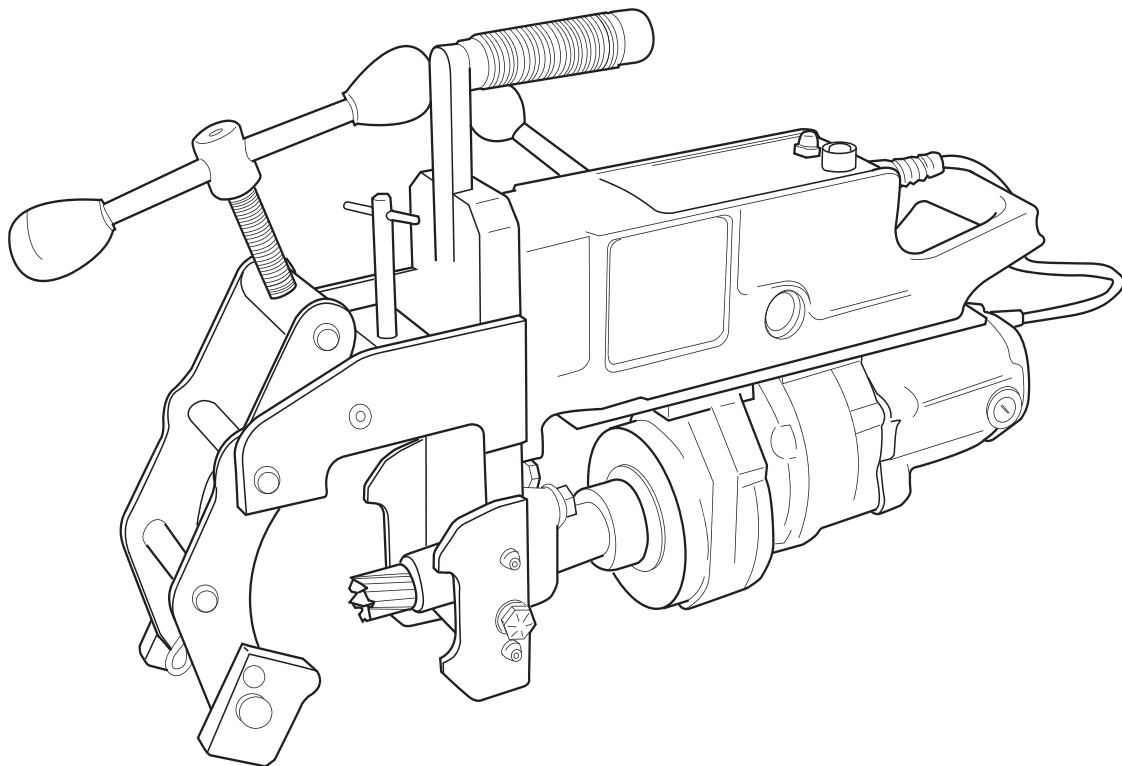




# **OPERATOR'S MANUAL MODEL 10923TS**



**PORTABLE ELECTRIC RAIL DRILL --- MANUAL FEED  
70 LB. A.S.C.E. TO 155 LB. P.S.**

Serial Number: \_\_\_\_\_

Date: \_\_\_\_\_

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# TRAK-STAR® Portable Gas Rail Drill

## Model 10923TS

### ***Welcome to Trak-Star***

Congratulations on your purchase of the Trak-Star Portable Rail Drill. Your model is designed to produce superior holes quickly and efficiently. Through constant innovation and development, Trak-Star is committed to provide you with hole-producing tools and products that lead the industrial world.

Before attempting to operate your new Rail Drill, please read all instructions first. These include the Operator's Manual and warning Label on unit itself. With proper use, care, and maintenance, your model will provide you with years of effective hole drilling performance. Once again, thank you for selecting our product and welcome to Trak-Star.

## **Unpacking Your New Rail Drill**

1. Open shipping carton and remove the literature and hardware packages.
2. Read and Follow All Instructions before attempting to operate your new Rail Drill.
3. Complete and mail the Product Registration Card NOW. It is important that Hougen Manufacturing, Inc., have a record of product ownership.
4. Open hardware package and check contents.
  - 10569 Feed handles (3)
  - 04532 Feed handle knobs (3)
  - 10565 Wrench-Allen 1/8"
  - 10727 Wrench-Allen 3/16"
  - 04149 Wrench-Allen 7/32" T
  - 01293 Wrench-Allen 3/32
  - 03635 Pilot
5. Lift Rail Drill out of shipping carton using drill housing handle and clamp handle
6. Screw the three knobs (04532) into the three feed handles (10569) and then screw the handle into the Hub Assembly (03177)
7. Your new Rail Drill was factory adjusted prior to shipping. Check to make sure that all gib adjustment screws, motor hold-down screws, front support bracket screws, drill housing and shoe mounting screws are snug and have not vibrated loose in transit.
8. Remove Coolant Bottle / Hose Assembly (01592) from the separate shipping container. Connect the quick-disconnect hose fitting to the Rail Drill. See Procedure on page 7.
9. Reread Safety Warnings listed in this Operator's Manual and on the drill unit to avoid injury. Follow operating procedures.

Your new Rail Drill is equipped with a 3/4" diameter arbor bore to accept TRAK-STAR cutters. Order cutters separately. Install pilot inside cutter before attaching cutter to arbor (see Procedure page 9)

# Important Safety Instructions

## 1. Read All Instructions

## 2. Grounding Instructions

This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with a 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. Your unit is for use on 230V. (Refer to Plug Diagram) Section D

## 3. Safe Electrical Connection

Your Rail Drill is rated for use on 230VAC at 50-60Hz. Do not attempt to use drill on power sources rated other than this. Wet electrical connections are shock hazards. To prevent the cutting fluid from traveling along the cord and contacting the plug or power outlet, tie a drip loop in the power cord. Also elevate extension cords or gang box connections.

## 4. Extension Cords

Use only 3-wire extension cords that have 3-prong grounding type plugs and 3-pole receptacles that accept the tool's plug. Replace or repair damaged cords. Make sure the conductor size is large enough to prevent excessive voltage drop which will cause loss of power and possible motor damage.

## 5. Do Not Force Tool

It will do the job better and faster at the rate for which it was intended.

## 6. Keep Work Area Clean

Cluttered areas and benches invite injuries. Keep dirt and chips from under Trak-Star Cutter area and drill shoes.

## 7. Consider Work Area Environment

Do not expose tool to rain.  
Do not use tool in damp or wet locations.  
Keep work area well lit.  
Do not use tool in presence of flammable liquids or gases. Disconnect from power source when changing cutters or maintaining drill.

## 8. Guard Against Electric Shock

Prevent body contact with grounded surfaces. For example: pipes, radiators, ranges, refrigerator enclosures.

## 9. Keep Children Away

Do not let visitors contact tool. All visitors should be kept away from work area while in use.

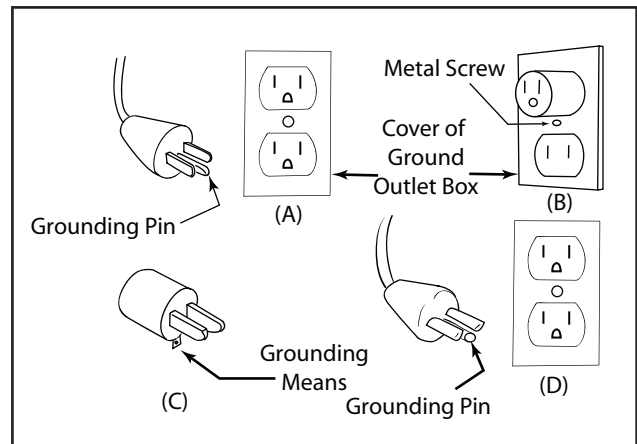
## 10. Store Idle Tools

When not in use, tools should be stored in a dry, and high or locked-up place — out of reach of children.

Extension Cord Table

LENGTH OF CORD, FEET	RECOMMENDED WIRE GAUGE	RECOMMENDED WIRE GAUGE
	115V MOTOR 10 - 12 AMPS	230 V MOTOR 5 - 6 AMPS
UP TO 25	16	18
26 - 50	14	18
51 - 100	10	16
101 - 200	8	14
201 - 300	6	12
301 - 500	4	10

Plugs and Receptacles



## 11. Use Right Tool

Do not force small tool or attachment to do the job of a heavy duty tool.  
Do not use tool for purpose not intended — for example — do not use a circular saw for cutting tree limbs or logs.

## 12. Secure Work

Clamp work securely using appropriate shoe size an shape.  
Tighten clamp by using two hands with handle placed in central position and tighten securely.

## 13. Always Wear Safety Glasses or Goggles

## 14. Dress Properly

Do not wear loose clothing or jewelry. They might entangle with spinning chips or get caught in moving parts. Rubber gloves and nonskid footwear are recommended when working outdoors. Wear sturdy leather gloves when working indoors.  
Wear protective hair covering to contain long hair.

# Important Safety Instructions - Continued

## 15. Do Not Abuse Cord

Never carry drill unit by its cord or yank it to disconnect from receptacle.  
Keep cord away from heat, oil, and sharp edges.

## 16. Do Not Overreach

Keep proper footing and balance at all time.

## 17. Maintain Tools With Care

Keep tools sharp and clean for better and safer performance.

Do not use dull or broken Trak-Star Cutters.

Follow instructions for lubricating and changing accessories.

Inspect tool cords periodically and, if damaged, have repaired by authorized service facility.

Inspect extension cords periodically and, if damaged, have repaired by authorized service facility.

Keep handles dry, clean, and free from oil and grease.

## 18. Disconnect Tools

Disconnect when not in use, before servicing, and when changing cutters or accessories.

## 19. Remove Adjusting Keys and Wrenches

Form a habit of checking to see that keys and wrenches are removed from tool before turning it on.

## 20. Check Damaged Parts

Before further use of the drill, a part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function.

Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this operator manual. Do not operate tool if switch does not turn it on and off.

## 21. Stay Alert

Watch what you are doing.

Use common sense.

Do not operate tool when you are tired.

Have defective switches replaced by authorized service center.

## 22. Outdoor Use Extension Cords

When tool is used outdoors, use only extension cords intended for use outdoors and so marked.

## 23. Additional Safety Precautions

Arbor and cutter should never be used as a hand-hold. Keep hands and clothing away from all moving parts. Do not use Trak-star Cutters where ejected slug might cause injury (slug ejected at end of cut).

Also, adhere to all operating instructions. Do not drill through any surface that may contain live electrical wiring. Drilling into a live wire could cause exposed metal parts of the drill to be made live. Remove chips wrapped around Cutter and arbor after each hole. With motor off and power disconnected, grasp chips with leather gloved hand or pliers and pull while rotating counterclockwise. Should the cutter become jammed in the work, stop the unit immediately to prevent personal injury. Disconnect the drill from the power supply and loosen jammed cutter by turning the arbor counterclockwise. Never attempt to free the jammed cutter by starting the motor. Service at authorized repair center only.

Do Not attach Rail Drill to a live 3rd rail track.

## 24. Non-Conforming Cutting Tools

Your Rail Drill is designed to use Trak-Star Cutters. The use of drilling tools having different shank styles is not recommended as they may not tighten securely in the drill arbor with risk of accident or injury.

## 25. Operating Near Welding Equipment

DO NOT operate this unit on the same work surface that welding is being performed on. Severe damage to the unit, particularly the power cord, could occur. This could also result in personal injury to the operator..

## 26. Circuit Breaker

Changing of the circuit breaker to a higher amp rated breaker, or bypassing the circuit breaker is not recommended and is cause for cancelation of the product warranty.

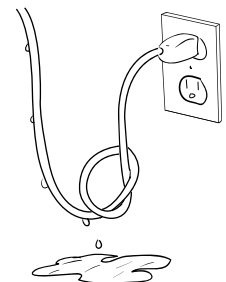
## 27. Circuit Breaker Operation

The circuit breaker is a thermal circuit breaker. When it reaches the higher temperature rating it will trip and cause the unit to shut down. This is a protection device and can be reset after 5 to 10 seconds of cool down period. To reset the circuit breaker, press the breaker button back in. If it does not reset, let the unit cool a little longer until you can push the button in and it stays in position.

## 28. Safe Electrical Connection

Wet electrical connections are shock hazards. To prevent the cutting fluid from traveling along the cord and contacting the plug or power outlet, tie a drip loop as shown. Also elevate extension cords or gang box connections.

## 29. SAVE THESE INSTRUCTIONS.



## Positioning of Optional Hole Location Template

Template is positioned on head of rail with tapered tip flush with end of rail and side locking screws fastened to rail head. Notches in template give precise location of hole centerlines to be drilled.

The rail clamp assembly has a locating pin which rests in the template notches. The locating pin is adjustable to accommodate the full range of rail sizes.

To use the locating pin, first make sure the pin is in its highest position and locked. The pin handle should be perpendicular to the rail. Raise the drill unit over the rail with the template attached and gently rest drill down until shoes make contact with the rail. Release the pin by turning handle a quarter turn, making the handle parallel with the rail. Slowly slide rail drill across the template until the pin falls into notch.

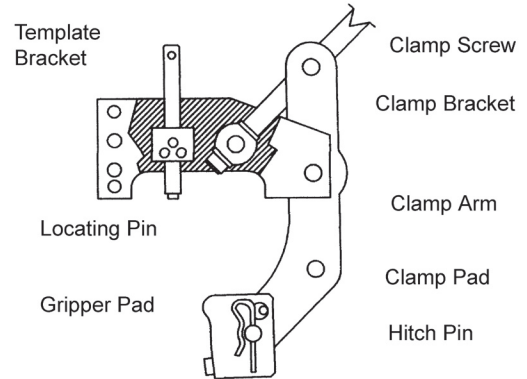


Figure 10

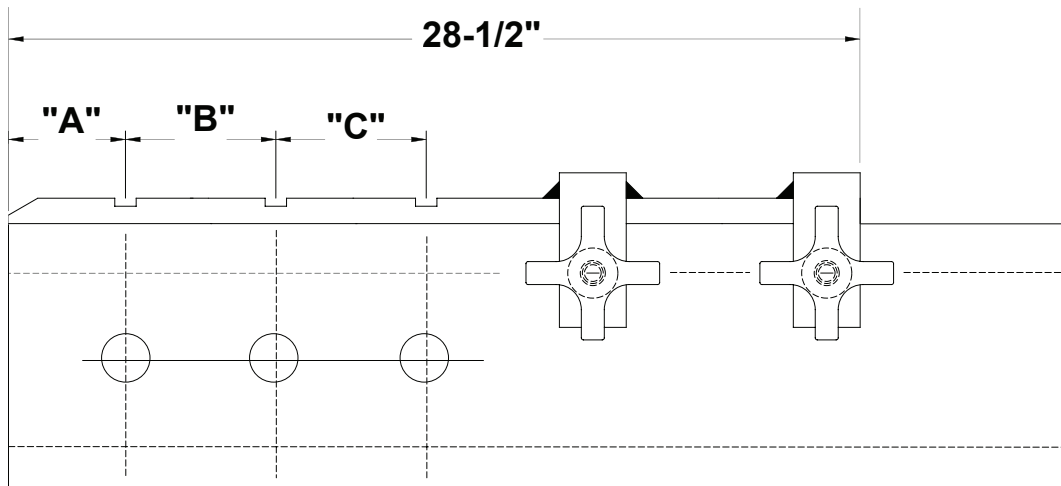
The pin must contact the sides of the matching notch and can touch the bottom of the notch. Following the Clamping Instructions, clamp unit onto rail. When the hole is completed, raise the pin by the handle and turn a quarter turn to lock pin into position. To drill the next hole, move the drill sideways, ensuring the pin is clear of the notch, and release pin. Slide the drill sideways until pin falls in the next notch, and repeat the procedure as necessary.

**Note: The locating pin must be in its uppermost and locked position before putting the drill unit on the rail. Failure to do so can result in damage to the hole locating pin system.**

Hole location templates are offered as optional equipment. Four of these templates are provided with established hole spacings. The 40570 template is produced to customer specified hole spacing. See chart for the template to match your application.

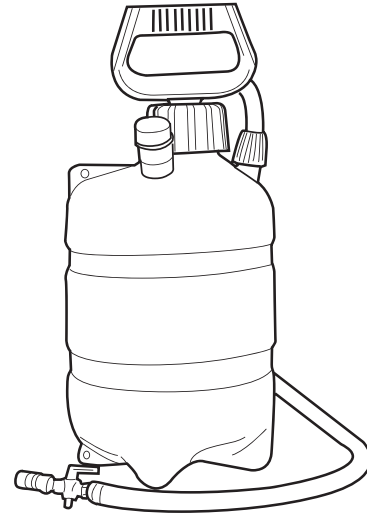
Template Part No.	Hole Spacing
40570	Customer Specified
40701	3-1/2" X 6" X 6"
40702	2-11/16" X 5-1/2" X 5-1/2"
40703	2-1/2" X 5" x 5"
40704	2-1/2" X 6-1/2" X 6-1/2"
40706	2- 23/32" x 5-1/2" x 5-1/2"

Fig 9 Template 40570



# Drill & Pressurized Coolant System

1. Install correct shoes for rail type being drilled.
2. Install correct size TRAK-STAR Cutter with pilot pin and secure to drill arbor with set screw(s). See Cutter Installation procedure.
3. Fill coolant bottle with TRAK-STAR cutting fluid ( a water soluble and biodegradable product) or equivalent. Conventional fill access is achieved by removing pump handle. Caution: Contents under pressure. Partially open to slowly release pressure before removing. A quick-fill access is also provided at the quick disconnect auxiliary hose port. This feature is intended for use when dispensing coolant from large drums with a hand pump.
4. Attach coolant bottle quick connect hose fitting to drill arbor at inducer fitting.
5. Pressurize coolant bottle (approximately 20 pumps)
6. Partially open coolant shut off valve.
7. Depress pilot pin approximately 1/4" and watch for coolant flow from the end of the cutter. NOTE - Coolant is under pressure -- stay out of path of spray. If coolant does not flow, rotate valve further to open or unclog coolant system.
8. Shut off coolant valve.



## Operation Controls

**IMPORTANT: Before turning on the machine, it is imperative that the operator know and understand instructions for safe operation, correct operation procedures and the location and interaction of control panel components and other related features.**

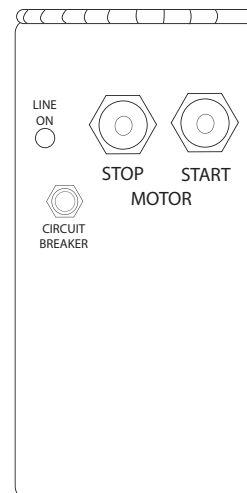
**MOTOR START SWITCH** - Starts the motor. (This is a relay operated motor control. The unit will not restart after a power interruption without depressing the start switch again.)

**MOTOR STOP SWITCH** - Deactivates Motor.

**LINE ON** - Light indicates unit has power.

**CIRCUIT BREAKER** - Provides motor overload protection with reset capabilities.

Plug unit into proper 115 volt AC power source. "Line On" light should come on. DO NOT use with DC power.





## IMPORTANT NOTICE



1. Make sure cutter is properly installed.  
(See instructions for installing TRAK-STAR Cutter in arbor)
2. The #1 cause of premature cutter failure is improper clamping. Read, understand and follow clamping procedures on the next page.
3. The #2 cause of premature cutter failure is improper feed, usually feeding too slow.
4. Always use caution in contacting the rail with the cutting tool. Allow the cutter to completely enter the rail before applying full feed pressure.
5. Do not force tool at the end of cut. Reduce manual feed pressure prior to breakthrough on the rail and allow the cutter to work.

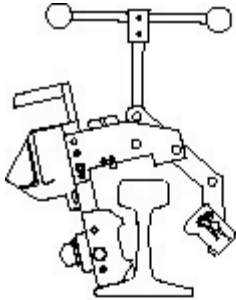
The TRAK-STAR 10923TS Electric Rail Drill in conjunction with the TRAK-STAR cutting tool provides you with the most efficient lightweight rail drilling system available. This new cutting technology will be most successful when the operator understands the above mentioned instructions.



# CLAMPING PROCEDURES

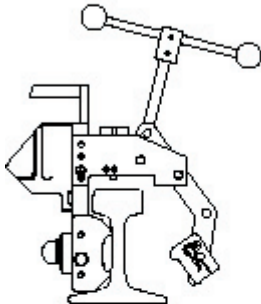


**WARNING: IMPROPER CLAMPING WILL CAUSE  
PREMATURE CUTTER FAILURE**



## **STEP #1:**

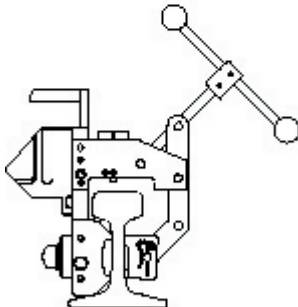
WITH CLAMP IN OPEN POSITION,  
REST UNIT ON RAIL BASE. BOTTOM  
OF SHOES SHOULD CONTACT  
TAPER ON RAIL BASE. **(SEE FIG. A)**



**\*\* PERFORMANCE TIP: CLOSE  
CLAMP UNTIL CLAMP PAD CON-  
TACTS WEB OF RAIL PRIOR TO  
STEP #2.**

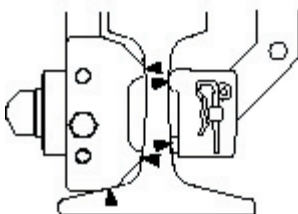
## **STEP #2:**

RAISE REAR OF RAIL DRILL TO  
LOCATE SHOES IN PROPER  
POSITION. **(SEE FIGURE B)**



## **STEP #3:**

WHILE MAINTAINING CONTACT  
BETWEEN SHOES AND RAIL,  
TIGHTEN CLAMP. **(SEE FIG. C)**



▲ INDICATES  
CONTACT  
POINTS

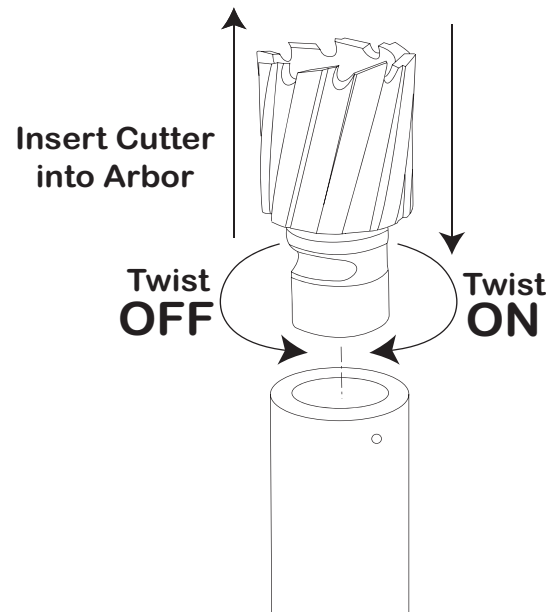
FIGURE D.

## **STEP #4:**

WHEN UNIT IS FIRMLY CLAMPED,  
CHECK FOR PROPER SHOE AND  
PAD CONTACT ON BOTH SIDES  
**(SEE FIG. D)**

## Installing / Replacing Twister™ Bit

1. Be sure engine is stopped and turned off. Turn off coolant at shut-off. The spring seat system located within arbor was not designed to be 100% leak proof.
2. Lay drill on its side with feed handles up.
3. Position slide so the arbor is accessible. Do not depress pilot pin during procedure to release seal. Doing so will result in releasing pressurized contents of arbor cavity and coolant loss. Some loss, however, is normal due to cavity between cutter shank and spring seat.
4. Insert pilot in shank end of Twister Bit.
5. Insert the Twister Bit until long flat on cutter shank is aligned with roll pin inside arbor. Twist cutter to the right (do not depress pilot in case of cutter replacement for reason noted in #3). The cutter is automatically held into place.



## Adjustment of Gibs

**Loosen all front support locking screws and bolts prior to adjusting gibs.**

1. Loosen Hex nuts (10563) and Set Screws (10958).
2. Feed the drill in and out a few times and then, with top of motor slide flush with top of housing, tighten the Gib Screws until you feel them touch the Steel Gib (40225).
3. Feed the drill in and out again.
4. Adjust Gib Screws so that there is uniform pressure from top to bottom. (Top of motor slide flush with top of housing)
5. Turn each Gib Screw in equally about 1/8 to 1/4 turn, depending upon your preference.
6. Gib Screws should be tight enough so that slide moves in and out smoothly with no wobble or shaking. (Looseness will cause cutter breakage)
7. Without rotating Allen Wrench in Set Screw, tighten each Hex Nut.

**Note: Gibs should be lubricated regularly.**

## Front Support Bracket Adjustment

**Adjust Gibs before adjusting front support bracket.**

1. Loosen Side Locking Screws (10623)
  2. Loosen arbor support bracket bolts (03690)
  3. Be sure top of arbor is flush with the shoulder on motor output shaft. Also make certain arbor is securely fastened.
  4. Turn feed handle until motor and spindle are at the bottom of their travel.
  5. Tighten Front Support Bolts. Recommended torque 80 ft/lbs. (Use Loctite 242 if possible)
  6. Feed slide in and out a few times, checking for free and uniform movement.
  7. Tighten Side Locking Screws. Do Not over tighten.
- Note: Check front support bolts regularly to make certain they are tight. Tighten as required.**

# Operating Instructions

1. Make sure workpiece, cutter and shoe surfaces are free of chips.
2. Place locator template on rail head.
3. Align drill on locator.
4. Lightly clamp to insure proper 3 point contact on each shoe.
5. Use two hands to fully tighten clamp. Unit must be snug to prevent movement during cut. Failure to do so will result in fractured cutters when contacting workpiece. Do not over tighten.
6. Turn on coolant. (Pump to repressurize system as needed.)
7. Start machine by depressing motor "START" switch.
8. Manually feed tool into rail slowly until all teeth are cutting. Increase feed pressure and use a steady feed rate. Do not pause during cutting or overload motor.

***Using light feed pressure or "babying" the cutter will only decrease cutter life.***

9. At end of cut press motor "STOP" button.
10. Turn feed handles to retract arbor and for slug ejection.
11. Remove or loosen clamp. Shut off coolant. Drill cycle is complete and you are ready for the next hole.

IF SLUG HAS NOT FALLEN FREE. Disconnect power source and shut off coolant supply. Use a screwdriver to carefully flip out slug by inserting it between slug flange and cutter gullet. Avoid using prying force. Poor slug ejection is a sign of a dull cutter.

## ***Motor Overloading***

Listen for signs of motor overloading or stalling during drill cycle. Reduce feed pressure if necessary. A slow-blow circuit breaker will react under gross overloading conditions. If the circuit breaker "Pops Out", follow this procedure:

1. Turn motor "OFF" by pressing motor "STOP" button.
2. Press circuit breaker "IN".
3. Turn motor "ON" by pressing motor "START" button.
4. Resume operation.

## Hints for Smoother Operation

1. The centrifugal clutch of the TRAK-STAR Gas Rail Drill requires a break in period of approximately 25-50 cutting cycles. The unit should be allowed to run for 15 to 20 seconds prior to attempting any cutting.
2. Keep inside of TRAK-STAR cutter clear of any chips. Chips will interfere with cutting to maximum depth as well as impede free coolant flow from arbor to work and can cause cutter breakage.
3. Keep slide dovetails, brass gibs, and feed rack lubricated and free of chips and dirt.
4. Tighten all bolts regularly.
5. Keep workpiece, machine, arbor and TRAK-STAR cutter free of chips and dirt.
6. For best operation and longest tool life, use TRAK-STAR cutting fluid mixed at proper ratios.
7. With engine off and spark plug wire disconnected, depress pilot occasionally to check metering of coolant flow. Lack of coolant may cause cutter to freeze in cut, slug to stick, and poor cutter life.

## Super Concentrate Cutting Fluid

A good flow of cutting fluid to the tool is important. It cools and lubricates the cutting edge, helps evacuate the chips, keeps the slug from expanding, and helps eject the slug. Various mineral and sulphur base oils are quite popular, however, water base solutions have better cooling qualities.

Listed is our own recommended Concentrated Cutting Fluid For TRAK-STAR Cutters and similar cutting tools. It is a water soluble, biodegradable product. This cutting fluid contains no ingredients that are on the U.S. Government Hazardous Materials List. It is a super concentrated form that will require a 10:1 mixture of water.

Order Number	Size Description
11742-4	4 Gallons**
11743	5 Gallons+
** MEASURED AMOUNT OF CONCENTRATE. COMES IN 4-1 GALLON CONTAINERS AND MAKES 44 GALLONS OF USABLE CUTTING FLUID	
+ COMES IN 5-GALLON CONTAINER, FULL, WILL MAKE 55 GALLONS OF USABLE CUTTING FLUID	

## TRAK-STAR Disposable Rail Cutters

### Fractional Rail Drill Cutters

Cutter Size, inches	Decimal Equivalent	Gold - TiN Coated Part Number	Black - TiAlN Coated Part Number
7/8	.08750	15228	15328
15/16	.09375	15230	15330
1	1.0000	15232	15332
1-1/16	1.0625	15234	15334
1-1/8	1.1250	15236	15336
1-3/16	1.1875	15238	15338
1-1/4	1.2500	15240	15340
1-5/16	1.3125	15242	15342
1-3/8	1.3750	15244	15344
1-7/16	1.4375	15246	15346
1-1/2	1.5000	15248	15348
1-11/16	1.6875	15254	15354
Pilot for Twister Bits			03635

TRAK-STAR Rail Drills are designed to use TRAK-STAR Rail Cutters, and to achieve maximum efficiency from your unit, we recommend that no substitutes be used.

\*\* TRAK-STAR Cutters are economical and disposable --- there is no need to sharpen --- however it is possible. Tools can be sharpened 2 to 3 times. See your local distributor for details.

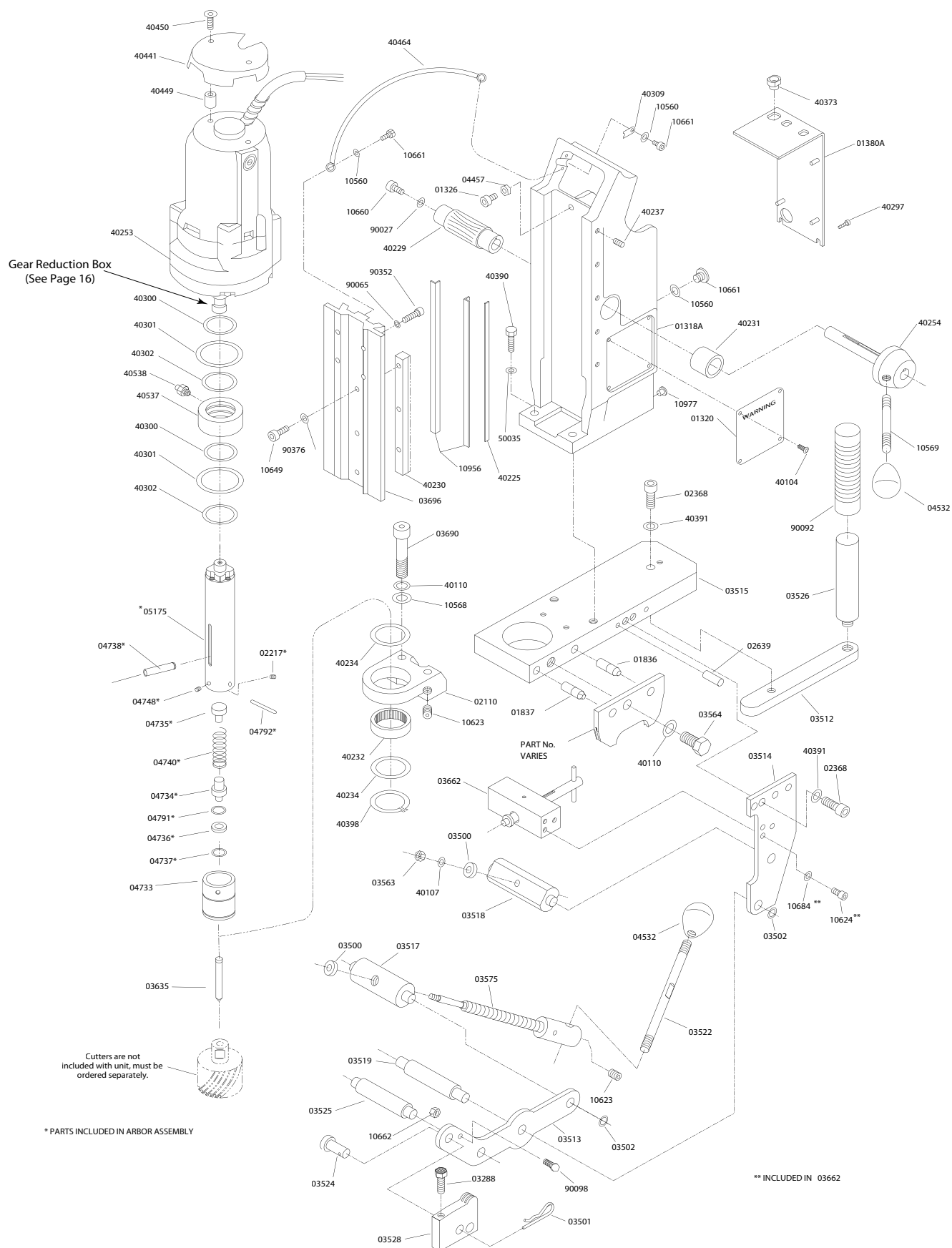
\*\* TRAK-STAR cutters have been shown to drill holes in rails up to 4X faster than twist drills or spade drills, and they produce clean, round, burr-free holes without the need to chamfer.

\*\* Multiple cutting edge design, along with proper coolant flow, produces a cool cut raising the rail temperature in the hole no more than 25°F above ambient temperature. This prevents work hardening, stress cracking, service failures, and repeated repairs.

## Rail & Shoe Data

Railway Association or System	Tee Rail Section (lb.)	Section Designation				Shoe Part No.
ASCE - American Society of Civil Engineers	70	7040	70	AS	701	01906
	75	7540	75	AS	753	01907
	80	8040	80	AS	800	01908
	85	8540	85	AS	851	01909
	90	9040	90	AS	---	01910
	100	10040	100	AS	---	01911
ARA - American Railway Association	Type "A" - High Rail for High Speeds					
	90	9020	90	RA	902	01927
	100	10020	100	RA	1003	01928
	Type "B" - Lower Rail for Heavy Loads @ Slower Speeds					
	90	9030	90	RB	905	01908
	100	10030	100	RB	1002	01910
AREA - American Railway Engineering Association	100	10025	100	RE	10025	01894
	110	11025	110	RE	1100	01895
	112	11228	112	RE	1121	01896
	115/119	11525	115	RE	1150	01897
		11937	119	RE	1190	
	130	13025	130	RE	1300	01898
	131	13128	131	RE	1311	01899
	132/136/141	13228	132	RE	1321	01902
		13622	136	RE	13637	
		---	141	---	---	
	133	13331	133	RE	1330	01901
	140	---	140	RE	---	01903
CSX	122	---	122	CB	---	01918
UP (former C & NW)	100	10035	100	DM	10035	01926
PS - Pennsylvania System	85	8531	85	PS	---	01912
	100	10031	100	PS	---	01913
	130	13031	130	PS	---	01914
	155	15531	155	PS	---	01919
NYC (Dudley) - New York Central & Hudson River Railroad	105	10524	105	DY	---	01915
	127	12723	127	DY	---	01916
PRR - Pennsylvania Railroad	85	8533	85	PR	---	01917

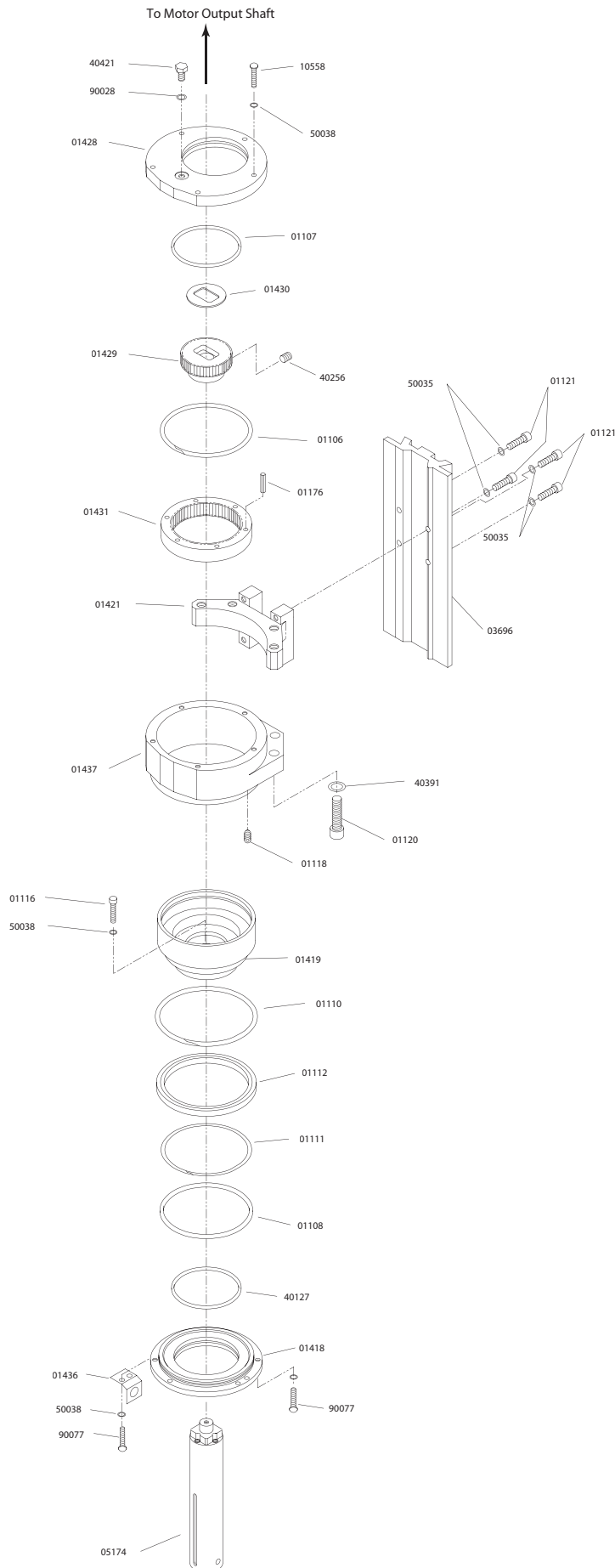
## 10923TS Exploded View



## Parts List -- Model 10923TS

Part #	Description	Qty	Part #	Description	Qty
01318A	Housing	1	10623	Set Screw 1/4-28 x 3/8	2
01320	Warning Tag	2	10624	Screw SHC 1/4-20 x 3/4	6
01326	Screw - SHC 1/4-28 x 1/2	1	10649	Screw #10-32 x 3/4	3
01836	Round Locating Pin	2	10660	Screw 1/4-20 x 5/8	1
01837	Diamond Locating Pin	2	10661	Screw #10-24 x 3/8	3
02110	Front Support Bracket	1	10662	Lock Nut - #10-24	2
02368	Screw - SHC 3/8-16 x 1	5	10956	Brass Gib (Pair)	1
02639	Pin-Dowel 3/8 x 1	4	10977	Screw BHC 1/4-20 x 1/4	1
03288	Gripper	2	40104	Drive Screw #2	8
03500	Machine Washer	2	40107	Hel. Lock Washer - 5/16	1
03501	Hitch Pin	2	40110	Hel. Lock Washer - 1/2	4
03502	Retaining Ring	6	40225	Steel Gib	1
03512	Clamp Carrying Arm	1	40229	Feed Gear	1
03513	Clamp Arm	2	40230	Rack Gear	1
03514	Clamp Bracket	1	40231	Bronze Bushing	2
03515	Base Plate	2	40232	Roller Bearing	1
03517	Clamp Round Bushing	1	40234	Thrust Washer	2
03518	Clamp Flat Bushing	1	40237	Set Screw - 1/4-28 x 1/2	5
03519	Clamp Middle Pin	1	40254	Feed Hub Assembly	1
03522	Clamp Turn Handle	1	40297	Screw #6-32 x 1/2	4
03524	Clamp Short Pin	2	40300	O-Ring	2
03525	Clamp Lower Pin	1	40301	Thrust Washer	2
03526	Clamp Carrying Handle	1	40302	Retaining Ring	2
03528	Radiused Clamp Pad	2	40309	Cord Clamp	1
03563	Hex Nut 5/16-18	1	40373	Strain Relief	1
03564	Bolt 1/2-13 x 1	2	40390	Bolt 1/4-20 x 1	3
03575	Clamp Feed Screw Assy	1	40391	Helical Lock Washer	7
03662	Template Locator Assy	1	40398	Retaining Ring	1
03690	Bolt 1/2-20 x 3	2	40441	Motor End Cap	1
03696	Motor Slide	1	40449	Motor End Cap Spacer	2
04457	Nut Hex 1/4-28	1	40450	Screw #10-32 x 7/8	2
04532	Feed Knob	3			
05174	Arbor Assy	1			
10560	External Tooth Lock Washer	2			
10568	Flat Washer - 1/2 ID	2			
10569	Feed Handle	3			

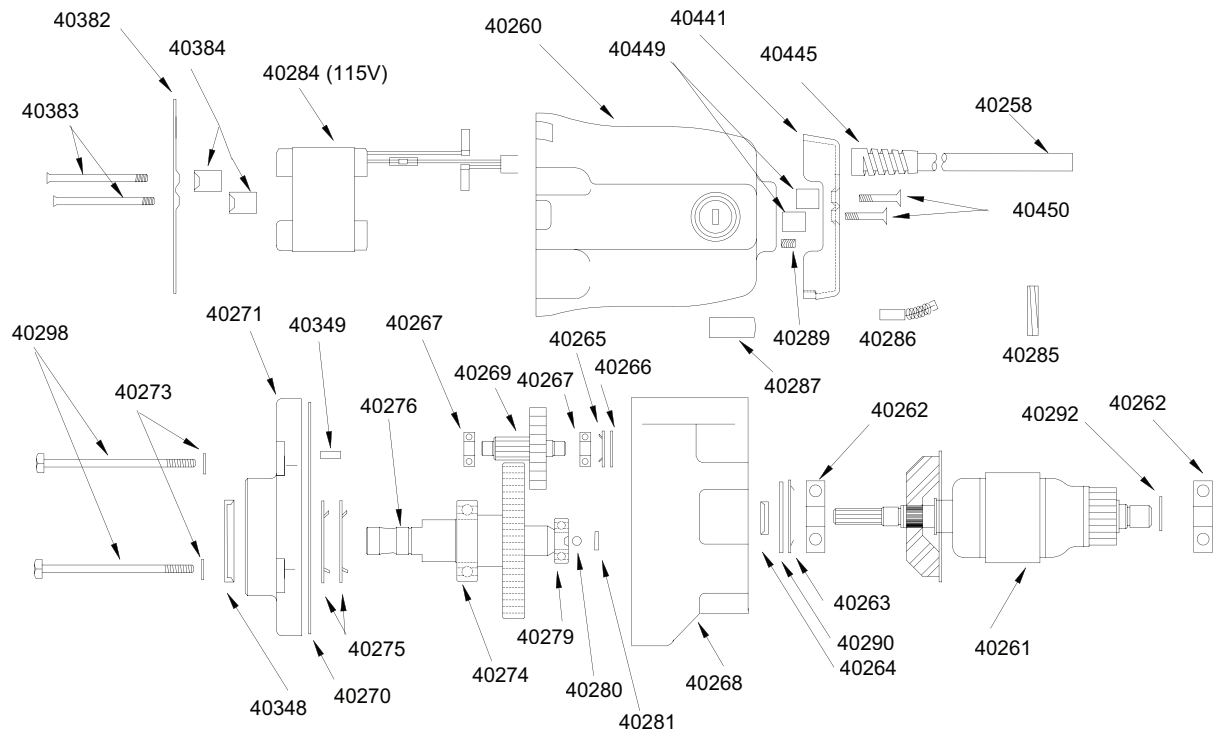
# Gear Reduction View & Parts



Part #	Description	Qty
01106	Retaining Ring	1
01107	O-Ring	1
01108	O-Ring	1
01110	Retaining Ring	1
01111	Retaining Ring	1
01112	Ball Bearing	1
01116	Screw SHC #10-32 x 1	4
01118	Set Screw 5/16-18 x 5/8	2
01120	Screw SHC 3/8-24 x 1	4
01121	Screw SHC 1/4-28 x 1	4
01176	Roll Pin	6
01418	Lower End Cap	1
01419	Bearing Housing	1
01421	Upper Support Bracket	1
01428	Top End Cap	1
01429	Altered Spur Gear	1
01430	Shim	1
01431	Internal Gear	1
01436	Inducer Strap	1
01437	Internal Gear Bearing Block	1
03696	Motor Slide	1
05174	Arbor Assy for Twister Bits	1
10558	Screw BHC #10-32 x 1	5
40127	O-Ring	1
40256	Set Screw 5/16-18 x 3/8	1
40391	Helical Lock Washer - 3/8	7
40421	Bolt 1/4-28 x 1/2	1
50035	Internal Tooth Washer	4
50038	Helical Lock Washer	15
90028	Lock Washer	1
90077	Screw BHC #10-32 x 1/2	6

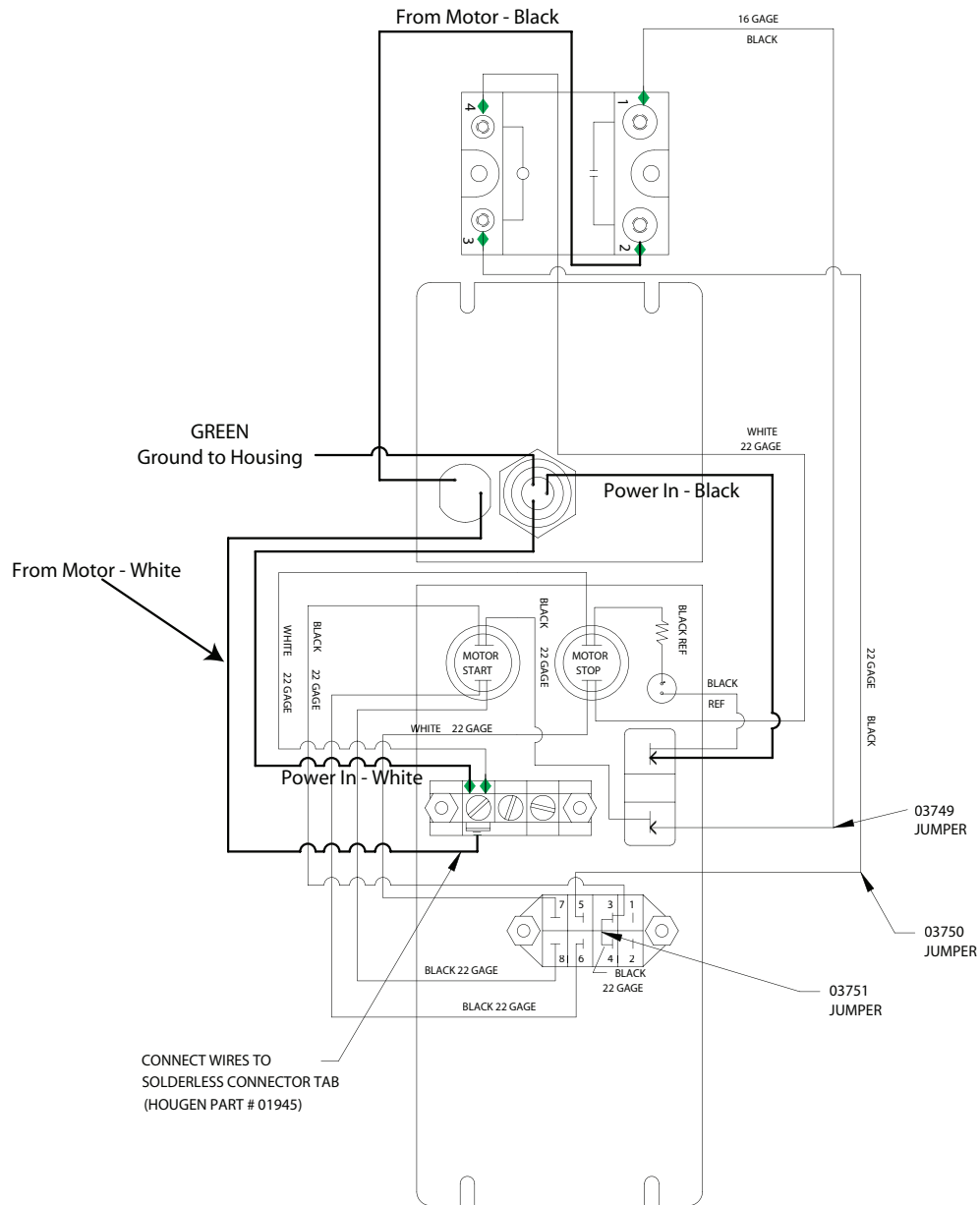


# Motor View & Parts List



Part #	Description	Qty	Part #	Description	Qty
40258	Motor Cord	1	40281	Motor Slug	1
40260	Housing, Brush End	1	40284	Field Assy 115V	1
40261	Armature Assy 115V	1	40285	Brush Plug	2
40262	Bearing	2	40286	Brush (Package of 2)	1
40263	Flat Spring	1	40287	Brush Holder	2
40264	Seal	1	40289	Screw #10-32 x 1/4"	2
40265	Flat Spring	1	40290	Washer	1
40266	Washer	1	40292	Retaining Ring	1
40267	Bearing	2	40298	Screw 1/4-20 x 3-1/2"	4
40268	Gear Housing	1	40348	Seal	1
40269	Gear Cluster	1	40349	Plug	1
40270	Gasket	1	40350	Syntech grease	8 oz.
40271	Cap. Gear Housing	1	40382	Baffle	1
40273	Lock Washer 1/4"	4	40383	Screw #10-32	2
40274	Bearing	1	40384	Baffle Spacer	2
40275	Flat Spring	2	40441	End Cap	1
40276	Gear Output	1	40445	Strain Relief	1
40279	Bearing	1	40449	Spacer	2
40280	Ball	1	40450	Screw #10-32 x 1"	2
			90424	Brush Holer Clip	2

## 20002A Wiring Diagram



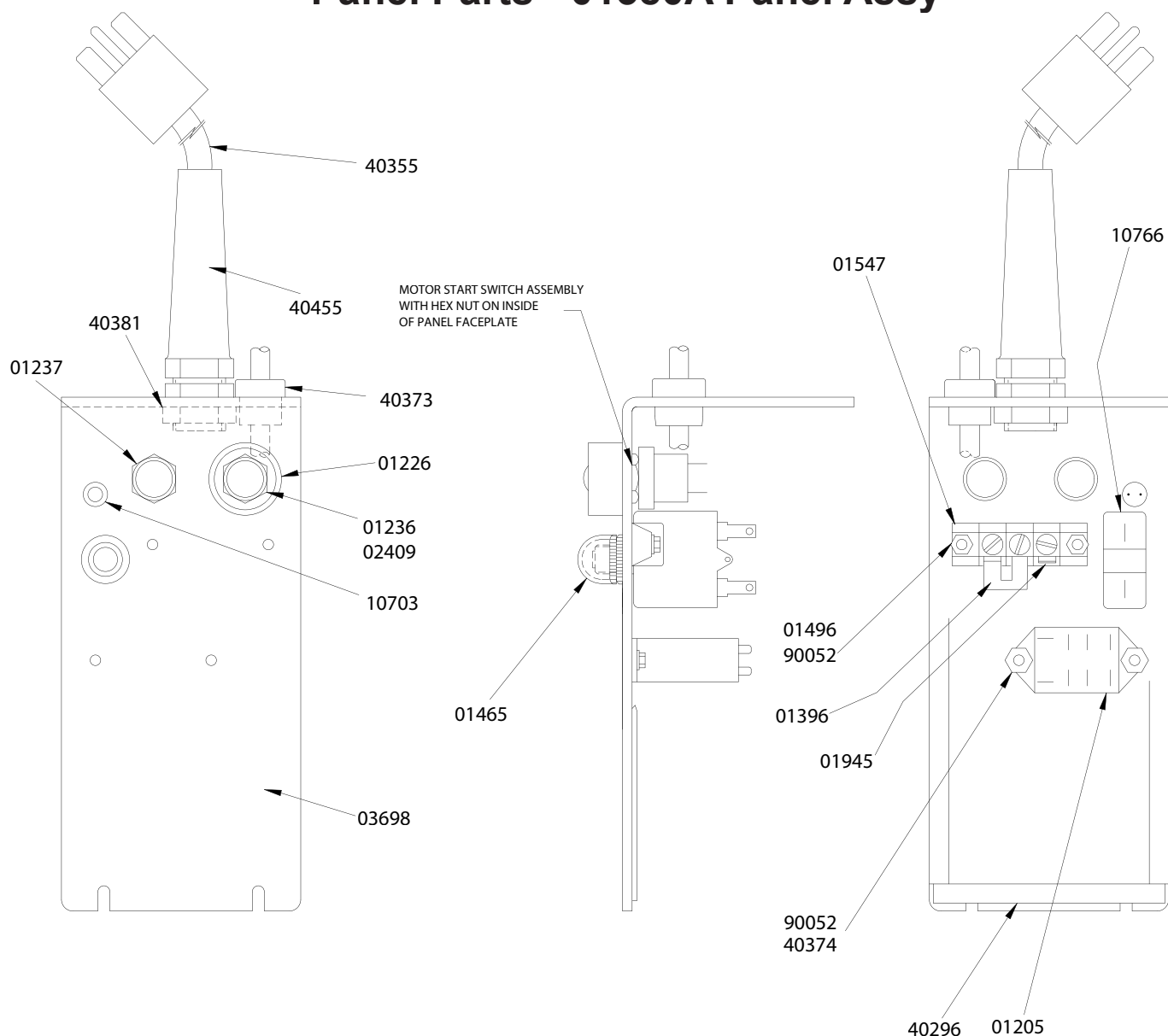
For 3 wire motors contact Trak-Star Technical Service

- ▶ PIGGYBACK CONNECTOR TO COMPONENT TERMINAL
- ◆ EYELET CONNECTOR
- SPADE CONNECTOR
- LEAD FROM COMPONENT
- | SOLDERED CONNECTION TO COMPONENT TERMINAL
- ⌞ RIGHT ANGLE SPADE CONNECTOR

USE # 90019 FOR FEMALE SPADE CONNECTOR USED ON 16 ga WIRE  
USE # 90218 FOR FEMALE SPADE CONNECTOR USED ON 22 ga WIRE  
USE # 01414 FOR RIGHT ANGLE SPADE CONNECTOR USED ON 16 ga WIRE  
USE # 01339 FOR RIGHT ANGLE SPADE CONNECTOR USED ON 22 ga WIRE  
USE # 90213 FOR EYELET CONNECTOR USED ON 16 ga WIRE  
USE # 51037 FOR EYELET CONNECTOR USED ON 22 ga WIRE  
USE # 90900 FOR PIGGYBACK SPADE CONNECTOR USED ON 16 ga WIRE

### INSTALL HEAT SHRINK TUBING OVER ALL SOLDERED CONNECTIONS

## Panel Parts - 01380A Panel Assy



Part #	Description	Qty	Part #	Description	Qty
01205	Relay	1	02361	Relay	1
01226	Switch Guard	1	02409	Seal - Green	1
01228	Seal - Red	1	10703	Pilot Light	1
01236	Switch	1	10766	Circuit Breaker	1
01237	Switch	1	40296	Seal	2
01396	Jumper	1	40373	Strain Relief	1
01465	Seal for Switch	1	40374	Hex Nut	2
01496	Spacer	2	40381	Hex Nut	1
01547	Terminal Strip	1	40455	Fitting- Strain Relief	1
01945	Spade Terminal	1	90052	Lock Washer	4

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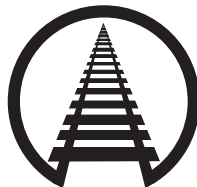
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