# NEW CRITICAL INSTRUCTIONS. MUST READ!

# HHX Ride-On Trowel

## *Cross Shaft and Drive Pulley Installation Instructions*

***The following instructions are intended to assist the user in the installation of a cross shaft and/or drive pulley. Please read all instructions before installation.***

## REQUIRED TOOLS

- Hammer
- Torque wrench
- 3/8" ratchet
- 3/8", 7/16", 1/2", 3/4", 9/16", 5/8", 15/16", 13mm sockets
- 3/16" and 1/4" Allen sockets
- Open/box-end wrenches
- Misc. pry bars
- CV joint grease
- Grease gun with multi-purpose grease
- 2" × 4" wood block
- Forklift/hoist
- Clutch puller
- Heavy-duty jack stands
- Scotch-brite pad
- Brake cleaner

## PARTS

Verify that all parts are accounted for. See Figure 1 and Table 1.

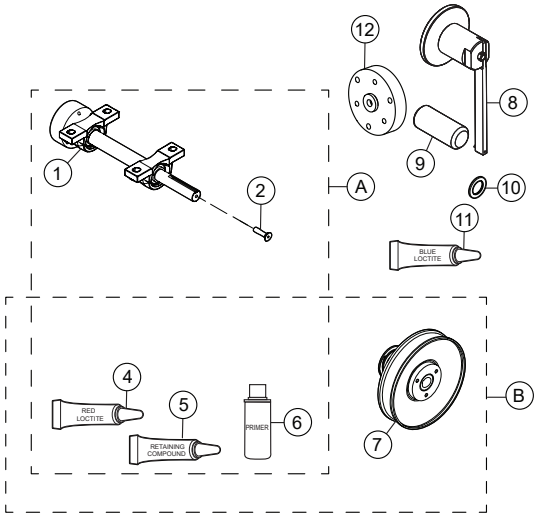


**Figure 1. Cross Shaft and Drive Pulley Kits**

**Table 1. Cross Shaft and Drive Pulley Kits**

| Item | Qty. | Part No. | Description | Remarks |
|---|---|---|---|---|
| A | 1 | 30106 | Cross Shaft Assy. Service Kit | Includes items 1–6 |
| B | 1 | 23363-2S | Pulley, Lower Assy. | Includes items 4–7 |
| 1 | 1 | 30104 | Cross Shaft Assy. | |
| 2 | 1 | 30107 | Screw, FHCS, 3/8-16 × 1.25 LH Thread | |
| 3 | 1 | 30110 | Spacer, CSK Ø1.375 Ø.391 × .281 | No longer required |
| 4 | 1 | 19379-014 | Loctite™ 271 | Red |
| 5 | 1 | 32434 | Retaining Compound, Loctite™ 609 | |
| 6 | 1 | 32441 | Primer, Loctite™ 7649 | |
| 7 | 1 | 23363-2 | Pulley, Lower | |
| 8 | 1 | 23436 | Alignment Gauge | |
| 9 | 1 | 23415 | Sleeve, Alignment Gauge | |
| 10 | A/R | 11773 | Shims | .031 Thickness |
| 11 | 1 | 1477 | Loctite™ 242 | Blue |
| 12 | 1 | 23420 | Coupler, CV Joint | |

**NOTICE**

The coupler (Item 12, P/N 23420) is intended to replace the existing coupler. This new, improved coupler will help minimize vibrations and run-out of the rotating assembly.

## WORK SAFELY!

Only a ***qualified service technician*** with proper training should perform this installation. Follow all shop safety rules when performing this installation.

## LIFTING THE TROWEL

1. Send a lifting strap or chain through the lift points on each side of the trowel. Attach the ends of the lifting strap or chain to the lifting device (Figure 2).

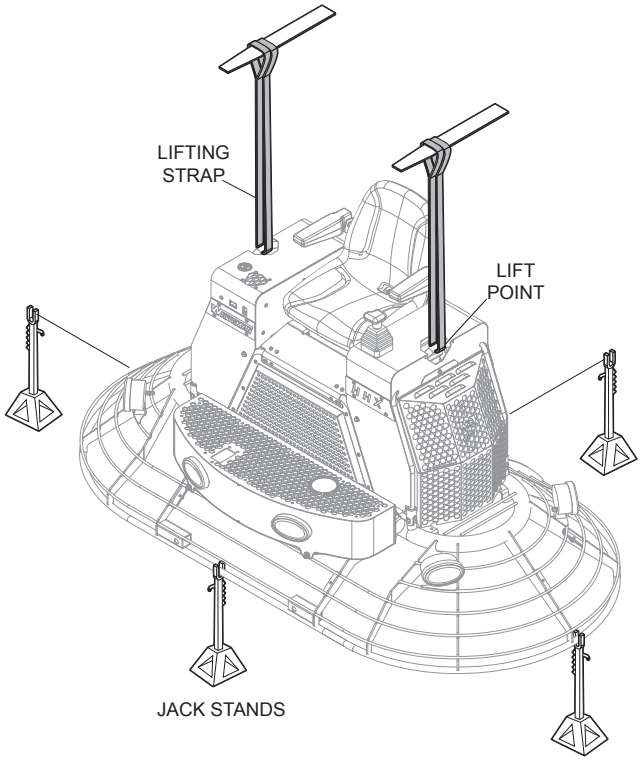


**Figure 2. Lifting the Trowel**

2. Place the trowel on heavy-duty jack stands.

> **⚠ CAUTION**
>
> Trowel blades are sharp. Keep clear of blades while performing procedure. It is recommended that trowel blades are removed to prevent injury.

## SIDE GUARD REMOVAL

1. Remove side guards from left and right seat frame assemblies. See Figure 3.

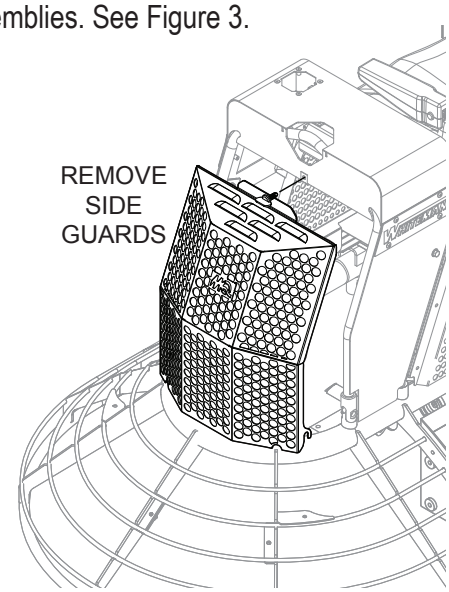


**Figure 3. Remove Side Guards**

## BATTERY REMOVAL

Refer to Figure 4.

1. Disconnect battery cables from the battery.
2. Remove battery from battery plate. Set aside in a clean, safe place.

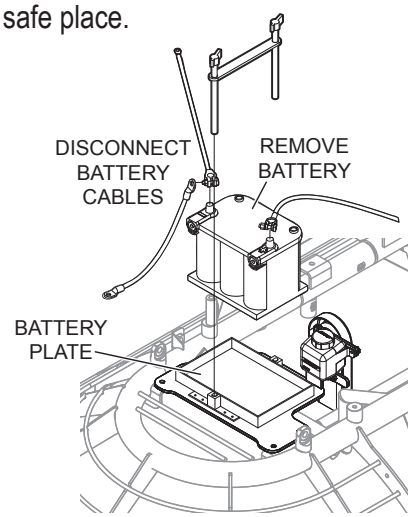


**Figure 4. Battery and Spare Belt Removal**

## SEAT FRAME ROTATION/REAR PANEL REMOVAL

Refer to Figure 5.

1. Use a 14mm socket to remove the 2 bolts that secure the left seat frame to the rear engine panel. Set bolts aside for later use.
2. Rotate the left-side seat frame to the horizontal position.
3. Remove side panel on right seat frame.
4. Repeat steps 1 and 2 for right-side seat frame assembly.
5. Rotate seat to vertical position.
6. Cut cable tie that secures choke cable to rear engine panel.
7. Loosen clamp around air intake hose.
8. Use a 16mm socket to remove the 2 bolts that secure the rear engine panel to the frame. Set bolts aside for later use.
9. Remove the rear engine panel and hardware. Set aside in a clean, safe place.

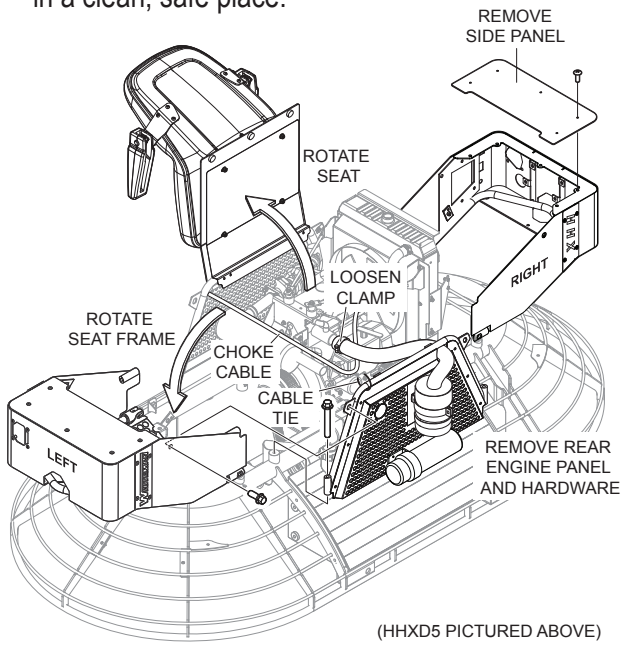


**Figure 5. Frame Rotation and Rear Engine Panel Removal**

## SPLASH GUARD REMOVAL

> ***NOTICE***
>
> If trowel blades have not been removed, they must be pitched flat in order to allow removal of splash pan.

1. Remove splash pan and hardware from trowel frame. Set aside in a clean, safe place. See Figure 6.

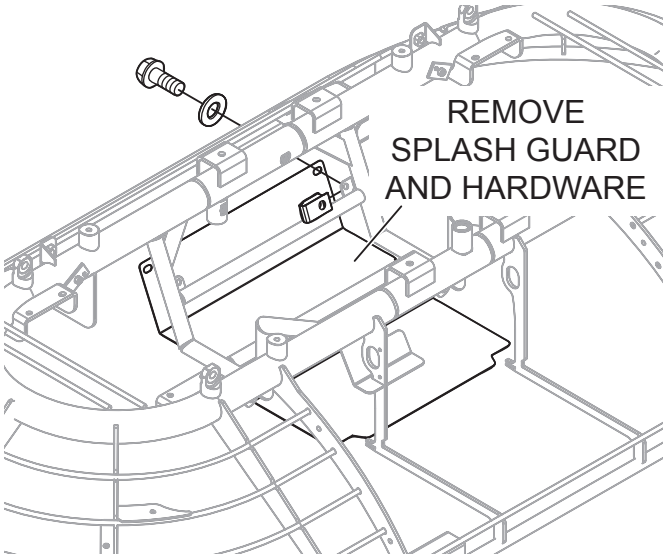


**Figure 6. Remove Splash Guard**

## FUEL TANK REMOVAL

Refer to Figure 7.

1. Place fuel shut-off valve on fuel tank in the OFF position.
2. Disconnect fuel lines from the fuel tank. Clamp lines to prevent fuel spillage.
3. Disconnect electrical connection from the bottom of the fuel pump (HHXG5) or fuel filter (HHXD5).

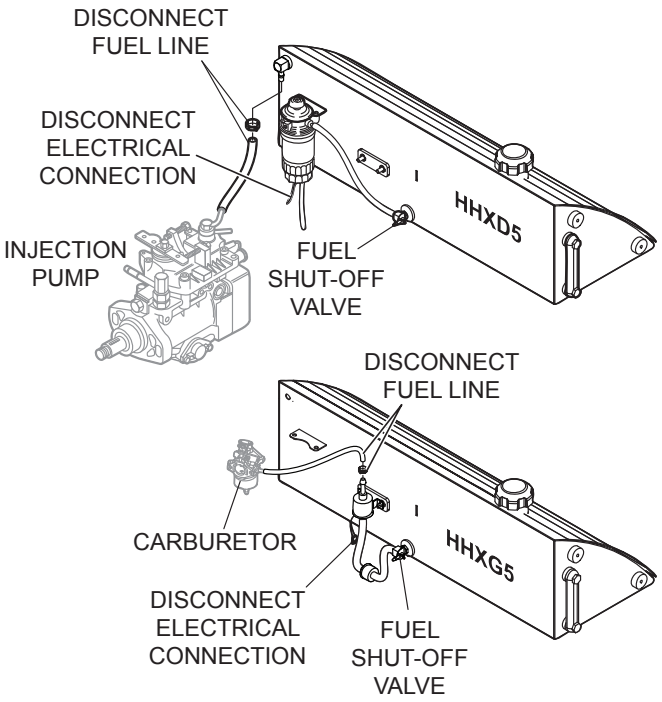


**Figure 7. Disconnect Fuel Lines and Electrical Connections**

4. Use a 13mm socket to remove the 4 bolts securing the fuel tank to the frame. Set aside for later use. See Figure 8.
5. If desired, fuel tank may be drained to make lifting from the trowel easier.
6. Remove fuel tank from frame. Set fuel tank aside in a clean, safe place.

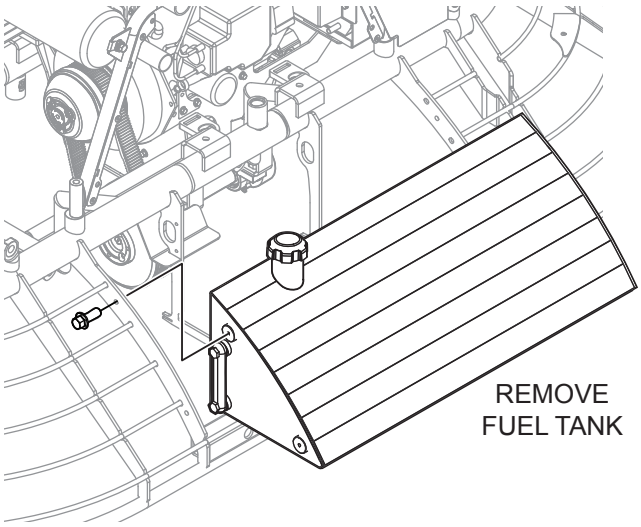


**Figure 8. Fuel Tank Removal**

## CV AXLE ASSEMBLY (LEFT-SIDE) REMOVAL

**NOTICE**

Spider assemblies must be locked to the frame with chains in order to prevent clutch rotation.

Refer to Figure 9.

1. Starting at the left-side gearbox, use a 1/4" Allen wrench to remove the 3 bolts that secure the CV axle to the left-side gearbox.
2. Next, use a 1/4" Allen wrench to remove the 3 bolts that secure the CV axle to the lower drive pulley coupler.

**NOTICE**

Note that the 3 bolts securing the CV axle to the coupler are shorter than those securing the CV axle to the gearbox. Remember bolt orientation for reassembly.

3. Remove CV axle assembly. A mallet may be needed to dislodge the CV axle.

**NOTICE**

If using a mallet, **DO NOT** hit the CV axle with too much force. This could cause the ball bearings to become dislodged.

4. Set CV axle assembly and mounting hardware aside in a clean, safe place.

## CV AXLE ASSEMBLY (RIGHT-SIDE) REMOVAL

**NOTICE**

**Disconnecting the right-side CV axle assembly from the gearbox is optional.** Inspect rubber boots for damage or dirt. If CV axle is in good condition, it is not necessary to remove it from the gearbox. **Removal of the bolts securing CV axle to the cross shaft coupler is mandatory.**

Refer to Figure 9.

1. Remove the 3 bolts that secure the CV axle to the right-side gearbox (optional).
2. Remove the 3 bolts that secure the CV axle to the cross shaft coupler.
3. Remove CV axle assembly (optional). Set CV axle assembly and mounting hardware aside in a clean, safe place.

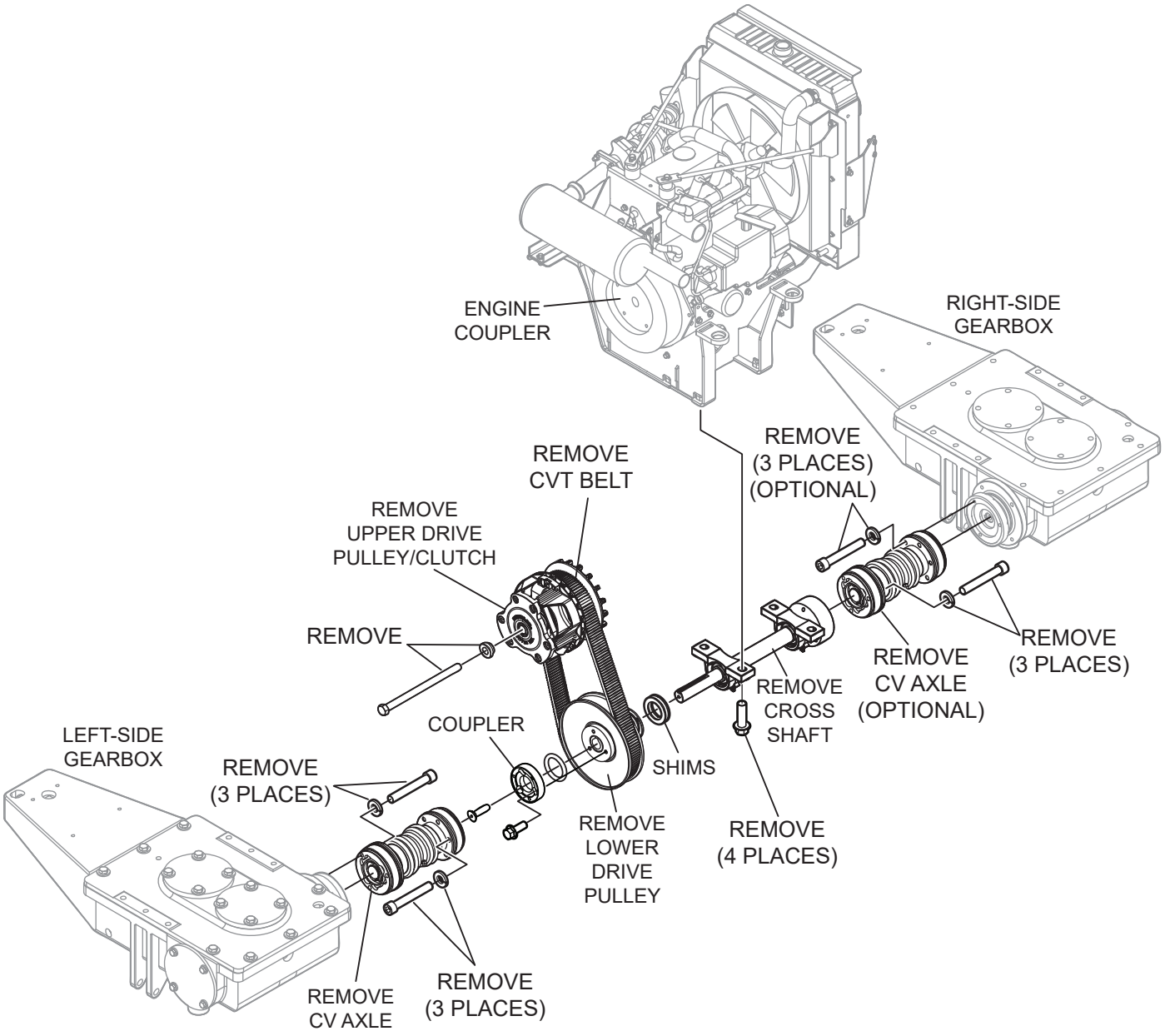


**Figure 9. Drive Assembly Removal**

## UPPER CVT PULLEY REMOVAL

Refer to Figure 9.

1. Remove the clutch retaining screw and step washer that secure the clutch/pulley assembly to the engine shaft.
2. Pull clutch assembly off engine shaft. Puller tool (P/N 23155) may be required to remove clutch.

## CROSS SHAFT/LOWER PULLEY REMOVAL

Refer to Figure 9.

1. Use a 16mm socket to remove the 4 bolts that secure the cross shaft bearing blocks to the engine cradle.
2. Remove cross shaft and lower pulley assembly. Discard item that will be replaced (either cross shaft or lower pulley or both, as required). Retain all other parts.

## CROSS SHAFT/LOWER PULLEY INSTALLATION

**NOTICE**

The trowel frame bar on which the left hydraulic steering cylinder mounts prevents the lower pulley from sliding on and off the cross shaft when it is mounted to the engine cradle. Because the alignment of the cross shaft is critical to drive assembly operation, the following procedure will be necessary.

1. Mount the cross shaft to the engine cradle.
2. Mark left bearing block position on the bottom of the cradle.
3. Shim cross shaft to align with stub shaft.
4. Remove cross shaft.
5. Mount lower pulley onto cross shaft.
6. Use scribe marks on engine cradle to reinstall cross shaft (with lower pulley) into the same position it was in during shimming.

The following sections describe the above procedure in detail.

### Cross Shaft Mounting

1. Remove dust caps located on top of new cross shaft bearings (Figure 10).
2. Using a grease gun, grease both bearings. Use multipurpose grade grease.
3. Reinstall dust cap to prevent contamination of the bearing.

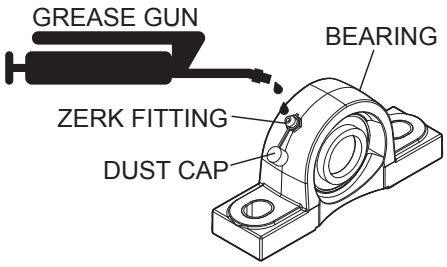


**Figure 10. Bearing Lubrication**

4. Use a 16mm socket to install **new** cross shaft assembly (P/N 30104) onto engine cradle with 4 existing screws. Apply Blue Loctite (P/N 1477). See Figure 11.

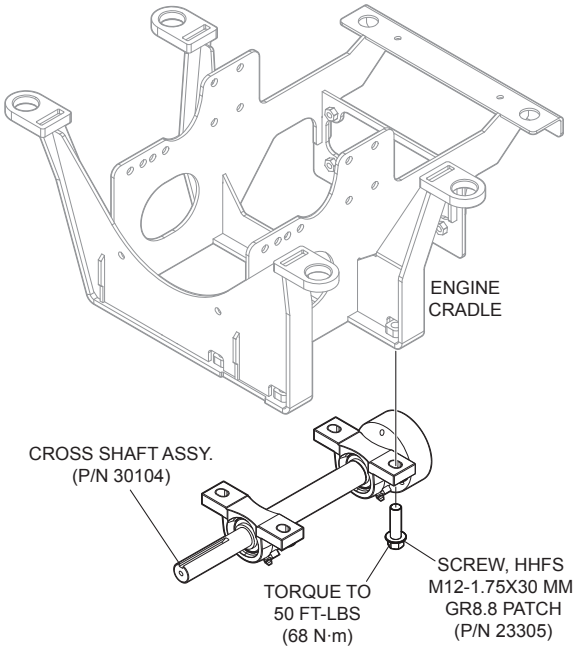


**Figure 11. Cross Shaft Installation**

5. Torque cross shaft mounting screws to 50 lbf·ft (68 N·m).

### Marking Cross Shaft Position

It is important to use a scribe to mark the edges of both bearing blocks on the bottom of the engine cradle. See Figure 12.

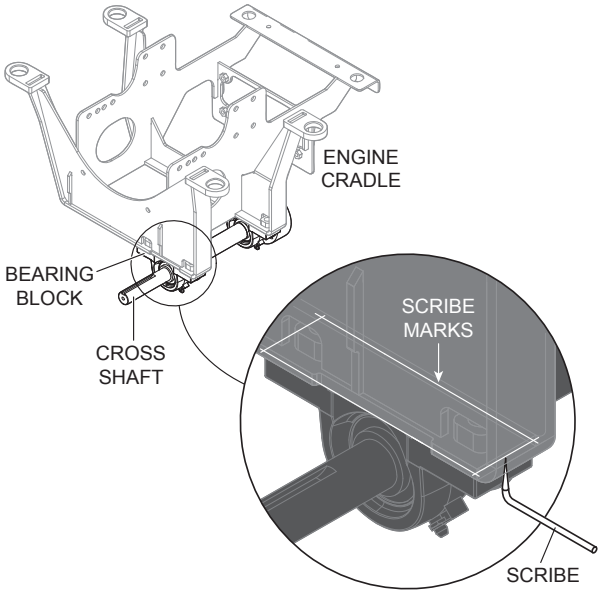


**Figure 12. Cross Shaft Scribe Marks**

## Cross Shaft Alignment

See Figure 13.

1. Install gauge sleeve onto cross shaft.
2. Install gauge body onto stub shaft. Torque alignment bolt to 20 lbf·ft (27.1 N·m).
3. Measure the distance between the gauge pin and gauge sleeve with a feeler gauge. This distance is an indication of the number of shims that will be required.

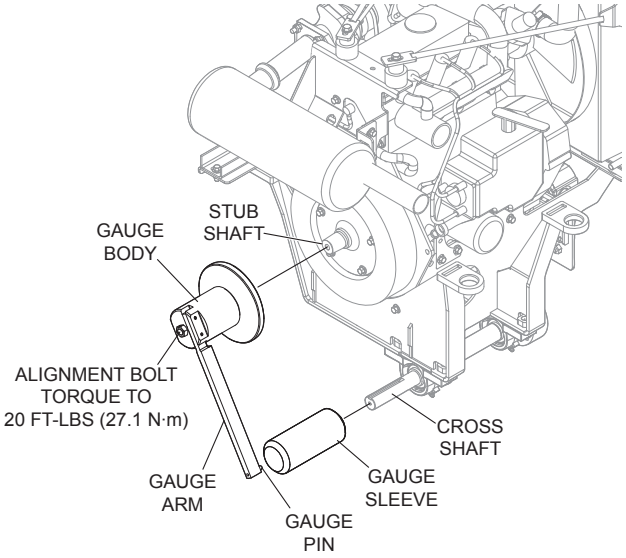


**Figure 13. Cross Shaft Alignment**

4. Rotate gauge arm and remove gauge sleeve. Install shims as required.
5. Reinstall gauge sleeve onto cross shaft. Insert 0.032" feeler gauge (Figure 14) between gauge pin and gauge sleeve.

> ***NOTICE***
>
> The gauge sleeve must be held and pressed firmly against the cross shaft bearing when using feeler gauge to provide the most accurate measurement.

6. If 0.032" feeler gauge fits between gauge pin and gauge sleeve, re-shim until feeler gauge will not pass between gauge pin and gauge sleeve.

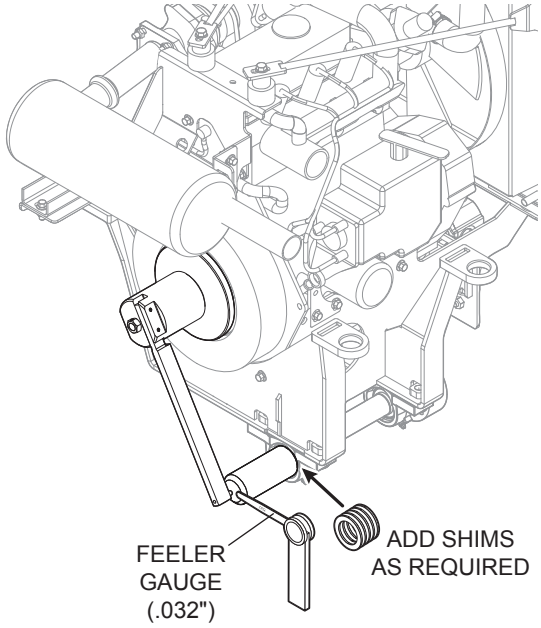


**Figure 14. Shimming**

## Cross Shaft Removal

Unmount cross shaft using a 16mm socket while making sure to keep shims on shaft.

## Lower Pulley Installation

Refer to Figure 15.

1. Clean the cross shaft and lower pulley with brake cleaner.

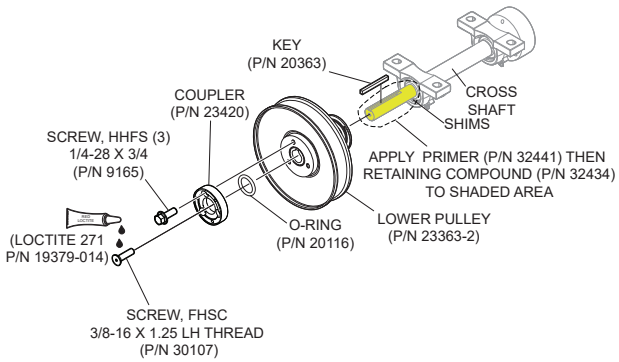


**Figure 15. Lower Pulley Installation**

2. Apply primer (Loctite 7649, P/N 32441) to the cross shaft and key way in the shaded area shown in Figure 15.
3. Using retaining compound (P/N 32434), apply to cross shaft and key way until coverage is complete with a minimum coating thickness of 1/16 of an inch.

4. Mount **new** lower pulley (P/N 23363-2) and key (P/N 20363) onto cross shaft.
5. Inspect the existing coupler. If it has a raised area as shown in Figure 16, retain the coupler and continue to the next step. If it does not have a raised area as shown, discard the coupler and use the new, improved coupler (P/N 23420) for the next step.

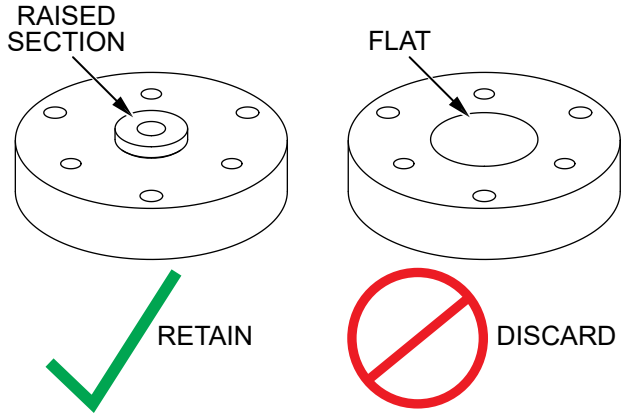


**Figure 16. Existing Coupler Inspection**

> ***NOTICE***
>
> When changing to the new coupler, the spacer (P/N 30110) is no longer required.

6. Mount coupler (P/N 23420) onto lower pulley with O-ring (P/N 20116) placed between lower pulley and coupler.
7. Secure coupler with 1/4-28 × 3/4" screws (P/N 9165).
8. Clean the threads of 3/8-16 × 1.25" LH thread retaining screw (P/N 30107) with brake cleaner. Apply primer (Loctite 7649, P/N 32441) then Red Loctite (P/N 19379-014) to the threads.
9. Insert 3/8-16 × 1.25" LH thread retaining screw (P/N 30107) into cross shaft.

> ***NOTICE***
>
> Mounting screws will not be torqued until after the Right-Side CV Axle Assembly is reinstalled/reconnected.

10. Once lower pulley has been mounted to shaft, wipe away any and all retaining compound.

> ***NOTICE***
>
> **It is extremely important** that this unit **must not** be run for a period of at least 24 hours. The retaining compound needs to cross link and become completely cured during this time period.

### Cross Shaft/Lower Pulley Installation

1. Remount cross shaft (with lower pulley assembly) onto engine cradle. Refer to "Cross Shaft Mounting"section and Figure 11.

> ***NOTICE***
>
> Make sure to align both bearing blocks with scribe marks on engine cradle. See Figure 12.

2. Place the CVT belt over the lower pulley. Do not attempt to squeeze the belt into the pulley groove yet.

## CV AXLE REINSTALLATION/RECONNECTION

Before reinstalling the CV axle assemblies, ensure rubber boots are not cracked or worn (Figure 17). If boots are damaged, replace immediately. If CV axle assembly is dirty or covered with debris, clean with a mild soap or solvent. If necessary, grease CV axle as required.

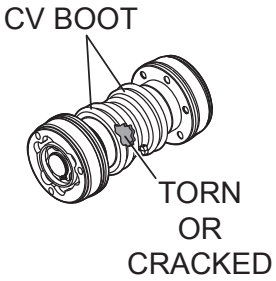


**Figure 17. CV Boot Inspection**

### Right-Side CV Axle

1. Apply a thin coat of RTV silicone (Figure 18) to mating surfaces of CV axle assembly.

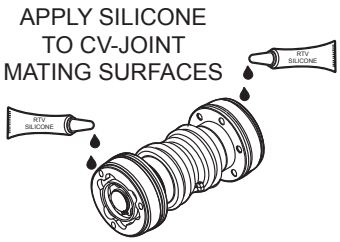


**Figure 18. Applying RTV Silicone**

2. Connect right-side CV axle assembly to cross shaft coupler and right-side gearbox coupler (if applicable).
3. Torque CV axle mounting screws to 12 lbf·ft (16.3 N·m).

> ***NOTICE***
>
> Before connecting left-side CV axle assembly, torque lower pulley mounting screws. See "Lower Pulley Mounting Screw Torquing" section.

### *Lower Pulley Mounting Screw Torquing*

See Figure 19.

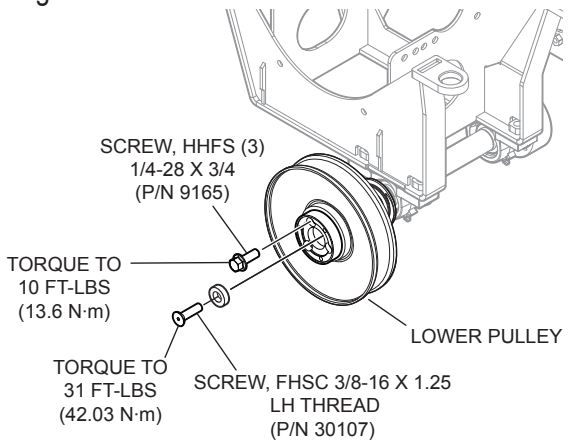


**Figure 19. Lower Pulley Mounting Screw Torquing**

1. Torque 1/4-28 × 3/4" screws (3) to 10 lbf·ft (13.6 N·m).
2. Torque 3/8-16 × 1.25" LH thread retaining screw to 31 lbf·ft (42 N·m).

## Left-Side CV Axle

1. Apply a thin coat of RTV silicone (Figure 18) to mating surfaces of CV axle assembly.
2. Connect left-side CV axle assembly to left-side gearbox coupler and lower pulley.
3. Torque CV axle mounting screws to 12 lbf·ft (16.3 N·m).

## PARTIAL REASSEMBLY / LOWERING TROWEL

The trowel must be lowered back to the ground prior to fully installing the belt and upper clutch. To gain access to lifting points, perform the following procedure. Refer to Figure 2 and Figure 5.

1. Reinstall rear engine panel with existing mounting bolts (2).
2. Rotate right-side seat frame back to vertical position and secure to rear engine panel with existing mounting bolts (2).
3. Rotate left-side seat frame back to vertical position. Temporarily secure to rear engine panel with existing mounting bolts. **DO NOT** overtighten, as left-side seat frame will need to be rotated back to horizontal position after trowel is lowered to the ground.
4. Lower trowel onto the ground. Follow all heavy lifting safety precautions.
5. Once trowel is on the ground, remove left-side mounting bolts and rotate left seat frame to horizontal position.

## LOWER PULLEY BELT INSTALLATION

With the CVT belt placed over the lower pulley, squeeze the belt (Figure 20) and pull the belt upwards and towards the rear of the trowel. This will spread open the faces of the lower pulley.

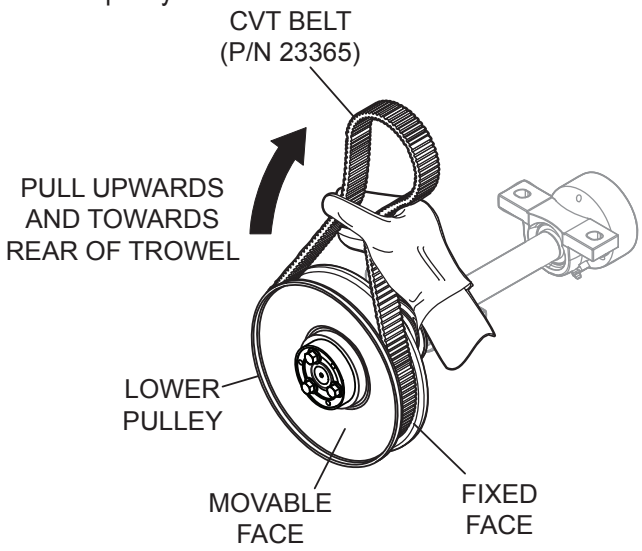


**Figure 20. Holding Lower Pulley Open**

***NOTICE***

**DO NOT** use a pry bar to open the lower pulley grooves. This can cause damage to the lower pulley.

## UPPER PULLEY BELT INSTALLATION

1. While holding the clutch, place free end of CVT belt into upper pulley grooves (Figure 21).

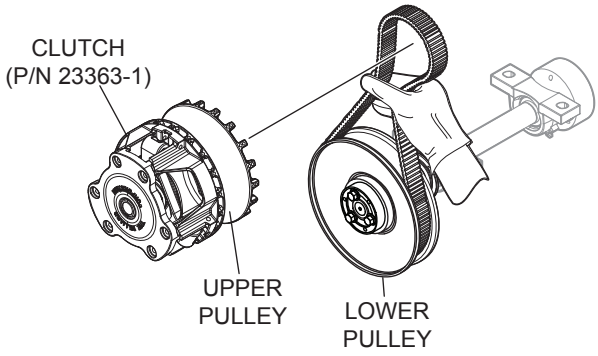


**Figure 21. Upper Pulley Belt Installation**

2. Once CVT belt has been placed into upper pulley grooves, mount clutch assembly onto stub shaft using 7/16-20 × 6.5" clutch retaining screw (Figure 22).

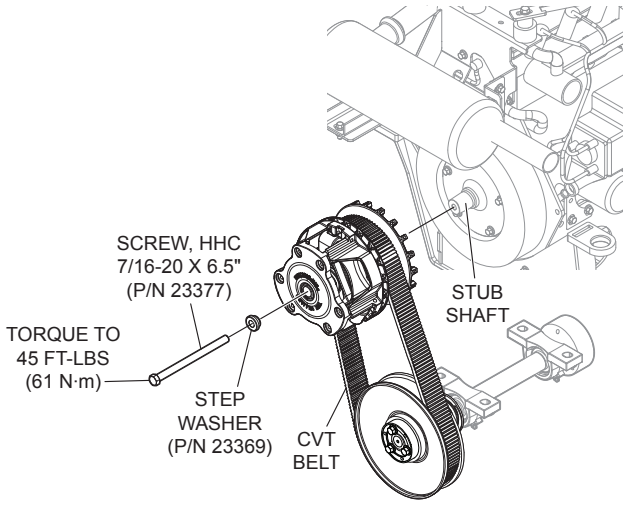


**Figure 22. Installing Clutch Assembly**

3. Clean the threads of the clutch retaining screw with brake cleaner.
4. Apply primer (Loctite 7649, P/N 32441) then apply Blue Loctite #242 (P/N 1477) to clutch retaining screw. See Figure 22.

***NOTICE***

Wedge a 2 × 4 block of wood between flywheel and trowel frame to prevent flywheel rotation so clutch retaining screw can be fully tightened.

5. Torque clutch retaining screw to 45 lbf·ft (61 N·m).

## REASSEMBLY

1. Rotate left-side seat frame back up to vertical position and secure with existing mounting bolts.
2. Secure choke cable to rear engine panel with cable tie.
3. Rotate seat down to operating position.
4. Reinstall fuel tank onto trowel frame using existing mounting hardware.
5. Reconnect fuel lines and electrical connections as referenced in Figure 8. Turn fuel shut-off valve to the **ON** position. If previously drained, refill with fuel.
6. Unlock spider assemblies.
7. Reinstall battery and reconnect battery cables — **RED** to the positive terminal, **BLACK** to the negative terminal.
8. Reinstall side guards (Figure 3).
9. Reinstall right seat frame side panel (Figure 5).
10. Reinstall splash guard (Figure 6).
11. Tighten air intake hose clamp (Figure 5).

# NOTES

# HHX CROSS SHAFT AND DRIVE PULLEY INSTRUCTIONS

## HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL NUMBER ON-HAND WHEN CALLING


### UNITED STATES

***Multiquip Inc.***

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

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