

QUICK LOCK LOCKUP TORQUE CONVERTER DRIVE UNIT



**Quick Drive, LLC
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303-783-1290**

SERIAL # _____

Congratulations on your choice of the Quick Lock, the finest lockup torque converter drive unit available! This information herein is provided to guide you through your installation and use of your Quick Lock. This unit is designed to be used for drag racing applications only and should perform flawlessly when installed properly and adequately maintained.

DRAG RACING'S BEST TORQUE CONVERTER DRIVE UNIT!!!

FEATURES AND SPECIFICATIONS

- Unequalled Transmission Brake Holding Capacity. 300 PSI CO2 pressure actuates the 9 disc brake clutch pack, providing transmission brake torque capacity in excess of 2500 ft-lbs.
- Ultra quick transmission brake release time. Extensive testing has led to the development of our brake release system. This system releases pneumatic pressure from 300 PSI to <20 PSI in 24 milliseconds, with less than 1 millisecond variation in over 500 cycles. As a point of reference, the average "Pro Tree" style Powerglide transmission brake releases in 40 milliseconds.
- Accepts all B&J planetary type transmission as well as Lenco planetary transmissions with the 1 1/2" 35 spline, 1 3/8" 32 spline, or 1 3/8" 6 spline input ring gear. It will also accept Liberty Gear transmissions with the mounting adapter available through Liberty Gear.
- Available Internal Safety Sprag Clutch allows the race car's engine to return to idle whenever the throttle is closed. It also allows the race car to safely coast to a stop in the event of a catastrophic engine failure. This Safety Sprag Clutch is rated at 2863 ft-lbs for 50,000 cycles or 1684 ft-lbs for 1,000,000 cycles. (Not recommended for vehicles over 1600 HP, or those prone to tire shake.)
- Pneumatic control of the lock-up hydraulic system allows for the ability to adjust the lock-up apply rate, while still providing near instant release of the lock-up clutch.
- Quick Lock offers the racer or tuner the ability to fine tune both the converter charge pressure and the converter lock-up apply pressure. The difference between these 2 pressures provides the apply force acting on the lock-up clutch.
- Manufactured with Pride with American materials in Colorado, USA.

UNPACKING

Your Quick Lock has been carefully packed to ensure safe arrival to you. Upon receiving your Quick Lock, un-bolt the unit from the crate, and remove all contents of the crate. The dump solenoid, drain plug, output shaft, and output shaft thrust washer may have been packed separately. When installing output shaft, output shaft end play must be checked and adjusted. See "OUTPUT SHAFT END PLAY" below. A thin coat of grease should also be applied to the rear seal before inserting the output shaft. It will be necessary to rotate the input and output shafts slightly to allow the splines to align. You may have to tap the output shaft in lightly with the palm of your hand to fully seat the shaft. Remove the Dump Solenoid from its bag and thread it into the dump valve housing on the left side

(driver's side) of the Quick Lock. Refer to Figure 1. Snug the dump solenoid up lightly with a pair of channel lock pliers. Plug in the weather-pack connector to the receptacle wired to the 3 way solenoid, and you are ready to install your Quick Drive.

INSTALLATION NOTES

When installing your Quick Drive, it is necessary to pay careful attention to the following:

- **TORQUE CONVERTER:** The Quick Lock has been designed to maximize the performance and fluid flow rate through your torque converter. It is absolutely necessary that any torque converter used with a Quick Lock has an internal bushing to support the turbine in the torque converter. This bushing will provide support and alignment for the front end of the input shaft of the Quick Lock. Apply a generous coating of petroleum jelly or assembly lube to the o-rings on the input shaft before installing the torque converter.
 - **TOTAL TORQUE CONVERTER INSTALLED RUNOUT:** Before installing your Quick Lock, bolt your torque converter to your flexplate with all attaching bolts. Install a dial indicator with the plunger on the hub of the torque converter approximately 3/4" from the end of the hub. Rotate the crankshaft from the front (not with a flywheel turning tool) while observing the dial indicator needle. Total torque converter hub runout should not exceed .010". If runout exceeds .010", unbolt the torque converter and rotate to a different position, reinstall bolts and recheck. If you cannot achieve less than .010" of total runout, check the flexplate for flatness or contact your torque converter manufacturer.
 - **TORQUE CONVERTER THRUST CLEARANCE:** It is extremely important for the torque converter to have adequate thrust clearance. It is equally important that the torque converter does not have excessive thrust clearance. To check this, install the torque converter into your Quick Lock, ensuring that it is fully engaged. With the flexplate installed on the crankshaft, install the Quick Lock to the engine, carefully checking that the torque converter turns freely. Tighten the bellhousing mounting bolts. At this time you should be able to pull the torque converter forward until the mounting pads contact the flexplate. The distance that you can push the torque converter away from the flexplate is the torque converter thrust clearance. This distance should be a minimum of .080" and a maximum of .180", with approximately .125" being ideal. If the distance exceeds .180" you may shim the converter mounting pads to the flexplate with washers, etc, to obtain the desired clearance. If the distance is less than .080", contact your torque converter manufacturer to shorten the overall height of your converter.
 - **OUTPUT SHAFT END PLAY:** Prior to installing transmission to the Quick Lock, output shaft end play must be checked and adjusted. The method described here is not the only way, but is quick and relatively easy to perform. It requires the use of an "H" Gauge, available under Part Number T-0030-A, for \$98 through Quick Drive, LLC or Atec Trans-Tool (atec-trans-tool.com). With the .060" output shaft thrust washer installed on the output shaft, and the output shaft fully installed into the Quick Lock, first set up the H Gauge to rest on the

front mounting surface of your transmission, with the center rod of the H Gauge adjusted to contact the front of the input ring gear, as shown in Figures 1 and 2 below.

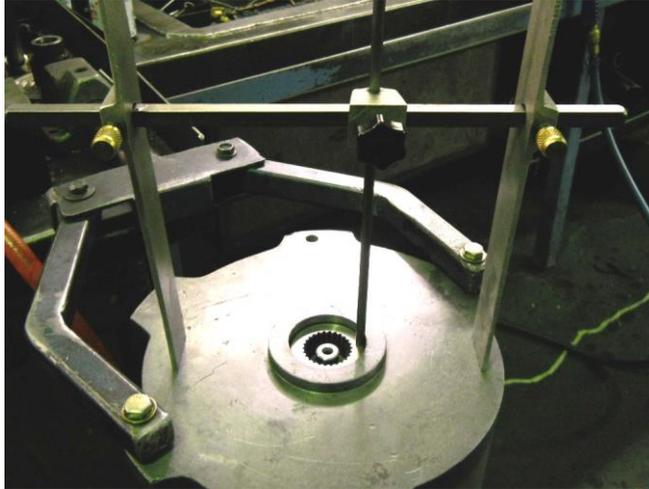


FIGURE 1

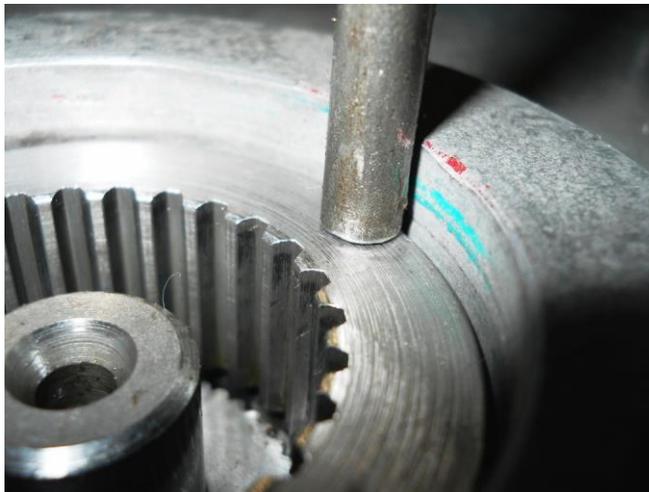


FIGURE 2 (Seal Removed for Clarity)

Then flip the H Gauge over to rest on the rear transmission mounting surface of the Quick Lock, with the center rod of the H Gauge over the shoulder at the base of the spline that engages with the input ring gear, as shown in Figures 3 and 4.

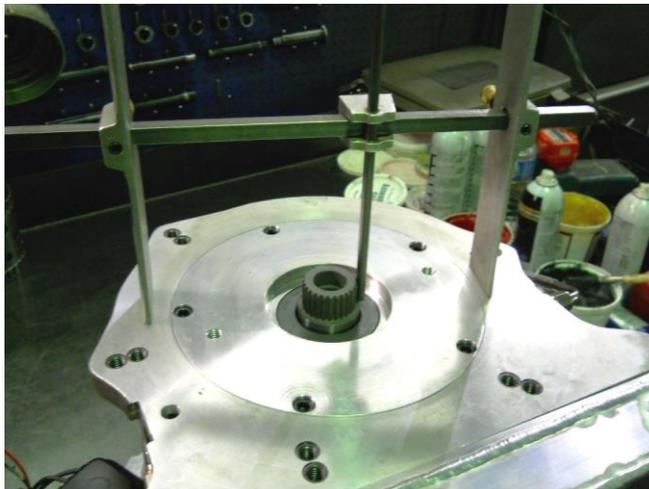


FIGURE 3

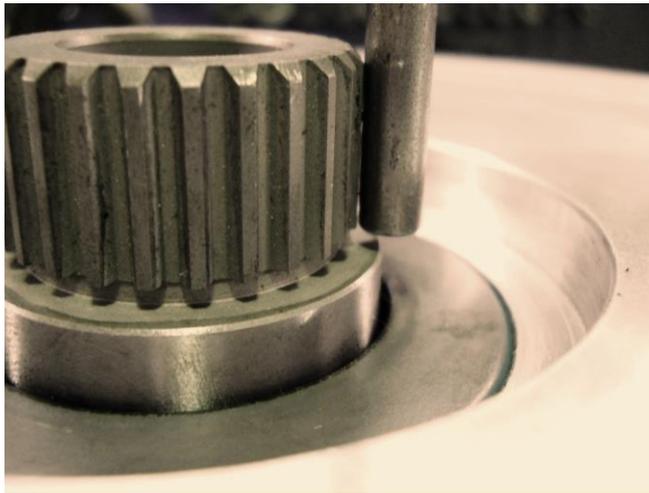


FIGURE 4

The clearance is not extremely critical, but there must be some end play. A minimum of .005" is adequate. To adjust, the thickness of the thrust washer for the front of the output shaft must be changed. There is a packet of assorted thickness washers included with your Quick Lock for this purpose. Washers may be stacked together if necessary. If your Quick Lock is not equipped with a Safety Sprag, the thrust washer may be eliminated altogether if necessary. Units with a Safety Sprag must have this thrust washer installed. Failure to perform this step can result in damage to the Quick Lock or the transmission if the output shaft has no end play.

- **TRANSMISSION BRAKE PLUMBING:** After the above steps have been completed, you can proceed with the installation of your Quick Lock and transmission. The transmission brake in your Quick Lock was designed to operate with 300 PSI of inlet pressure. Although many race cars may have adequate brake holding capacity with less pressure, reducing this pressure can adversely affect brake release time, and is not recommended. US Transmission has preset 300 PSI regulators available under Part #; QD-57350. All that is needed is to plumb a single line from the regulator outlet to the inlet fitting of the three-way solenoid mounted to the Quick Lock. (See Figure 5, below.) For turbocharger applications when the engine must be brought up to stage RPM and boost levels before entering the stage beam, consult with the Turbocharged Quick Drive Supplement.

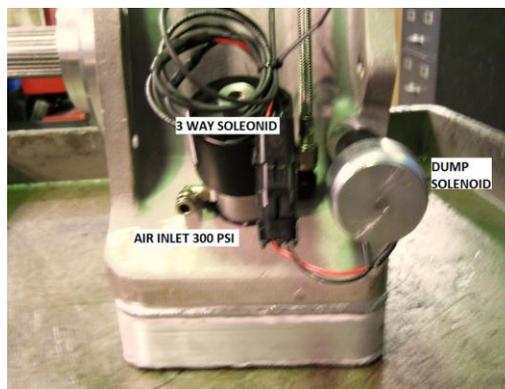


FIGURE 5

- **VENT PLUMBING:** The vent fitting near the top of the Quick Lock case must be plumbed into a suitable containment reservoir of at least one gallon capacity, using a minimum of a -6 line. The reservoir must be adequately vented to allow for thermal expansion. Ideally, this reservoir should be installed at a position in the race car higher than the vent fitting of the Quick Lock. The reservoir should be baffled such to prevent fluid leakage to the atmosphere. Venting the Quick Lock into an existing catch can / puke tank is acceptable as long as there is sufficient tank capacity and venting.
- **LOCK UP CO2 PLUMBING:** You will have received a 3 way MAC solenoid valve (blue square valve) which must be mounted on the vehicle, preferably somewhere relatively close to your Quick Lock. The inlet of the MAC valve (Port #1) should have 125 PSI CO2 plumbed to it. (We have preset 125 PSI regulators available; Part # QD-57125.) From the outlet of the MAC valve (Port #2), plumb a ¼” nylon line to the flow control valve mounted on the right hand side (passenger side) of your Quick Lock. See Figures 6 & 7. This flow control valve allows you to slow down the apply rate of the lockup clutch in your torque converter, while the quick exhaust valve (the square block valve that the flow control valve is mounted to) allows the air pressure to exhaust very quickly when the MAC valve is turned off, thereby allowing the lockup clutch to release very quickly (such as during a shift of the transmission). Whenever the MAC valve is energized, the lockup clutch will apply.

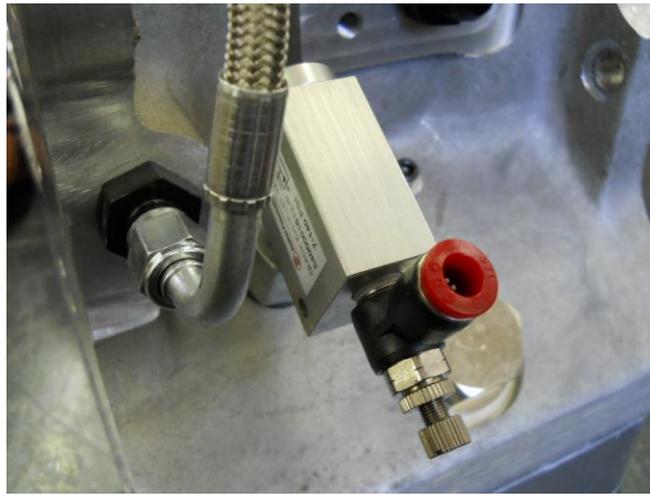


FIGURE 6



FIGURE 7

- **INPUT SHAFT SPEED SENSOR:** Your Quick Lock is equipped with an input shaft speed sensor. You will need to check with Racepak for the correct cabling for your system. The sensor (Racepak Part Number 800-SS-MS-3), is compatible with all types of Racepak data recording systems, and needs to be set up to read 4 pulses per revolution. The data from this sensor is essential to monitor torque converter and lockup clutch performance.
- **WIRING THE LOCKUP SYSTEM:** There are many ways to control the lockup clutch function of your Quick Lock. It can be controlled by time or by RPM with a variety of different controls. The COMMAND MODULE from Electrimotion (www.electrimotion.com ; (740) 362-0251) works very well for supercharged applications, with the ability to control the fuel system, timing, and lockup clutch. Electrimotion can also build a modified version of the COMMAND MODULE without the timing control. Visit the “QUICK DRIVE TOOLBOX” on our website: www.quickdriveracing.com for several other methods of wiring the lockup system, or contact us for more information
- **FILLING AND CHECKING FLUID LEVEL:** Before starting the engine, fill Quick Lock with Dextron 6 full synthetic automatic transmission fluid to the bottom of the threads of the fill port (on passenger side of case). Although other fluids can be used, research has proven Dextron 6 to have the highest static friction capacity, promoting greater brake clutch torque capacity. Start engine and allow to idle. Add fluid to bring level back to the bottom of the fill port threads while idling. Install fill plug.
- **TRANSMISSION BRAKE OPERATION:** The Transmission brake in your Quick Lock must be used to stop the input shaft of your transmission from turning in order to shift the reverser (it essentially becomes your clutch). You will need to practice the use of the transmission brake switch to smoothly shift the reverser, particularly after the burnout. **DO NOT** engage the transmission brake while the car is moving. Racers using a delay box may wish to utilize the box’ lockout feature to prevent accidental engagement. Racers not using a delay box may wish to wire an air switch into their front transmission case to prevent accidental brake application after the first transmission shift has been made.
- **MAINTENANCE:** The Quick Lock has been engineered to be the most trouble free torque converter drive unit available. Depending on the power level of the application, we recommend draining and refilling the fluid every 10 to 50 passes. By maintaining adequate CO2 pressure

and volume (the bottle should be weighed after every pass until you have a good idea how many passes you can get on a single bottle fill) and proper use of the transmission brake, the brake clutch should provide years of trouble free use. Improper use such as engaging the transmission brake while the car is moving or at high engine RPM will dramatically reduce brake clutch friction life, and could result in severe internal damage to the Quick Lock as well as potentially resulting in personal injury. The Safety Sprag Clutch should also provide similar longevity. However, cars that are prone to tire shake will experience accelerated Sprag Clutch wear. It is recommended that your Quick Lock be returned to US Transmission during the off season to be freshened (depending on the number of passes annually).

- **COOLING THE QUICK DRIVE BETWEEN RUNS:** Provisions have been made to allow for cooling your Quick Lock between runs. When plumbed and used as directed, the cooling system will exchange the fluid in the torque converter as well as in the sump of the drive. To do this, fluid must be pulled from the oil pan of the Quick Lock (typically through a Jiffy Tite connector attached to the -8 drain plug boss), circulated through a cooler / chiller apparatus, then into the Quick Lock at the 1/8" NPT port at the top of the drive marked "CONV". Check the "LINKS" button on our website (www.quickdriveracing.com) for a partial list of companies manufacturing cooling / chiller units designed for this purpose.
- **SERVICING BRAKE CLUTCH:** To service the brake clutch pack in the Quick Lock, it is recommended that the drive unit be removed from the race car. Once removed, the dump valve solenoid, housing and fittings (including pipe nipples) must be removed from the drive unit so that the rear piston housing may be removed. Remove the 5 bolts retaining the rear piston housing and gently pry the piston housing from the case. You may find it easier to remove the pan, filter and filter extension, then use a flat blade screwdriver or small pry bar to spread the clutch pack through the access slots in the bottom of the drive unit. Once the piston housing is removed, remove the clutch components from the drive unit, paying close attention to the assembly order and the orientation of the thrust bearings on either side of the clutch hub. Inspect the frictions for signs of burning, flaking, etc. Inspect the steels for any signs of damage. Some distortion of the steels in the area around the outside diameter where they engage the 4 dowel pins is normal; this can be filed smooth if you desire. Reassemble the clutch pack in this order: first the thrust bearing must be installed into the center support, then the clutch hub. Next, install the frictions and steels, starting with a steel plate against the center support, then altering steel plate and friction until 9 frictions and 10 steels have been installed, ending with a steel plate. Measure clutch pack clearance as follows. Set up your H Gauge to rest on the mounting surface in the case where the piston housing bolts in, with the center rod contacting the end steel plate (closest to the rear of the unit). See Figures 8 and 9.

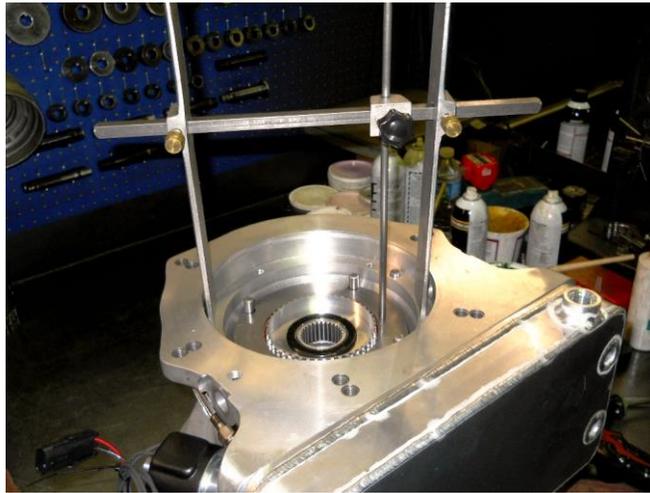


FIGURE 8

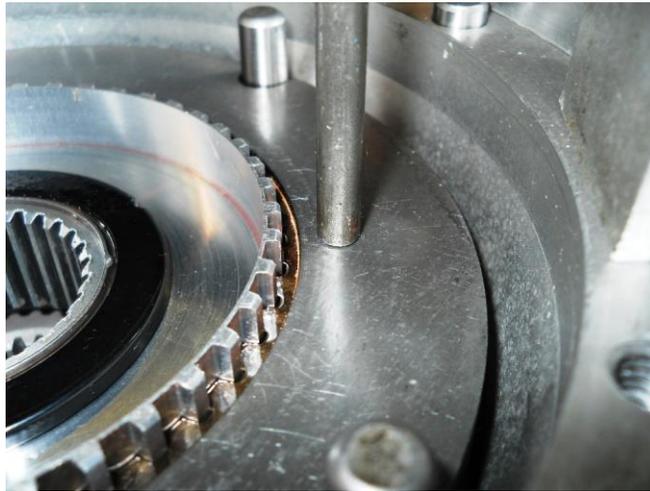


FIGURE 9

Then flip the H Gauge over to rest on the mounting flange of the piston housing, with the center rod over the raised flat section of the piston. The distance between the center rod and the piston is the clutch clearance. See Figures 10 and 11.

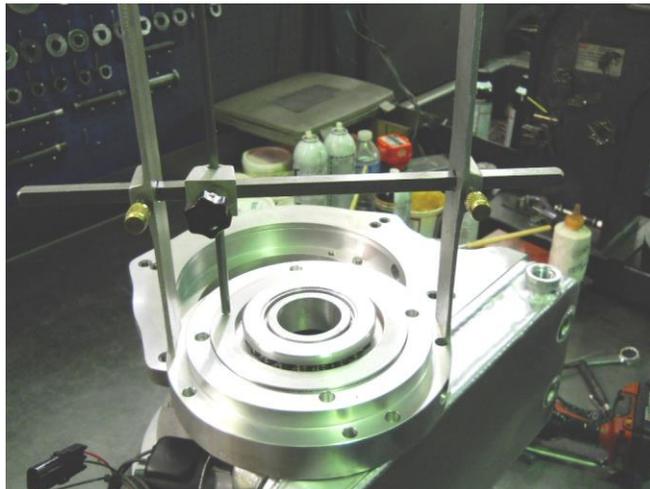


FIGURE 10

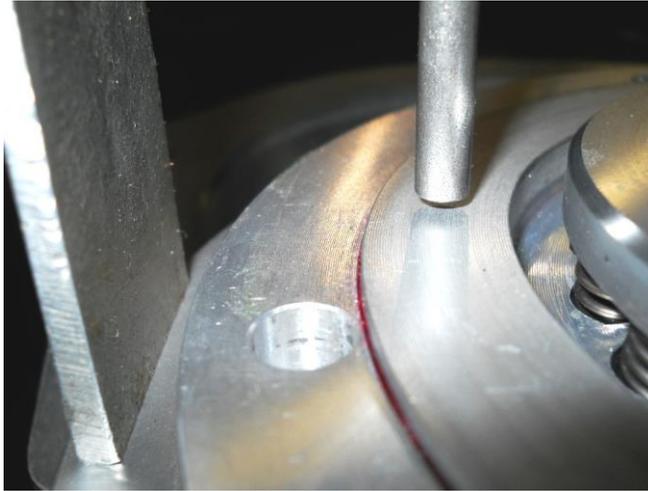


FIGURE 11

Recommended clearance for the clutch pack is .060" - .100", with .080" - .090" ideal. Clutch pack clearance can also be checked from inside the pan area by using a feeler gauge through the drain slots above the filter / filter adapter (Figure 12). Clutch pack clearance can be adjusted by altering the use of thick (.062") and thin (.043") steels, sometimes using multiple steels stacked together. The piston can also be cut on a lathe to fine adjust the clearance. The clutch pack clearance was preset during initial assembly, and re-use of dimensionally equal components should restore clearance to the proper specification. The clutch pack may be serviced in the vehicle if so desired; but the use of special tools to align the clutch hub is required. Contact us for more information.



FIGURE 12

THANKS FOR SELECTING QUICK DRIVE, LLC!

We would like to thank you for purchasing your Quick Lock, and wish you great success. Feel free to contact us with any questions you may have concerning the installation and use of any of our products.

ENJOY AND GOOD LUCK!!!

DISCLAIMER

Racing is dangerous. The customer assumes all responsibility for the use of these products. Due to the stresses that racing puts on components, and because we have no control of how these products are used, we assume no liability for the use of this unit, or for any resulting damages from the failure or breakage of any part or parts associated with this product.