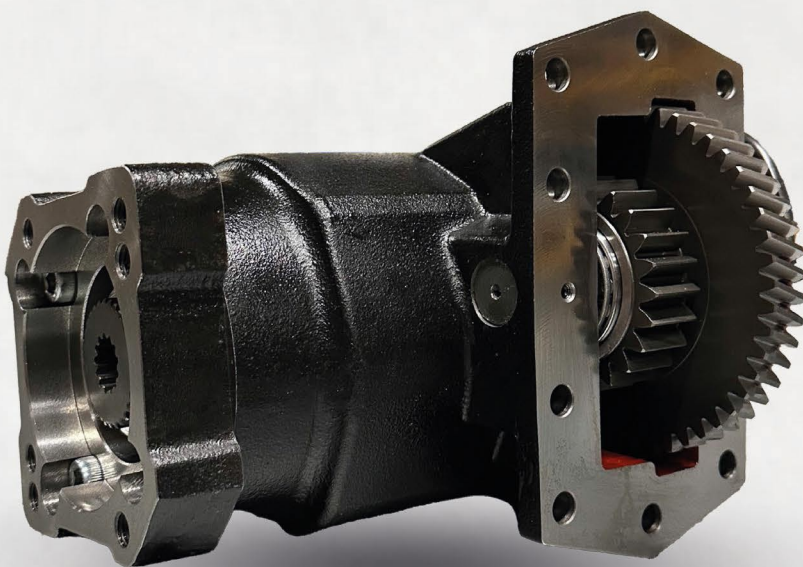




ALLISON

3000-4000 SERIES



USER MANUAL

Your
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The pictures used in this manual are for demonstration purposes and may not be identical to the actual purchased products.

1. Safety Information

The following information is for your safety. Make sure to read and understand them before attempting to use the equipment.

1.1 Overall Safety

- ✓ Carefully read the user manual provided and take notice of the instructions indicated.
- ✓ The important sections for operator safety and a prolonged product life are marked with symbols. Take notice of such symbols.
- ✓ Never work alone when doing repair or maintenance works under the vehicle.
- ✓ Make sure to check if the instructions you follow and the tools you use are intended for the work you are engaging in.
- ✓ Never use worn or damaged parts.
- ✓ Do not attempt any modification on the PTO or any other drive components of the vehicle.
- ✓ Ensure to mount the parts properly.
- ✓ Check backlash when engine is stopped.
- ✓ Do not go under the truck when the engine runs.

2. Instructions for Operation in Cold Weather

The disengaged PTO might transmit high levels of instant torque in cold weather (0°C and below), leading to rotation on the output shaft. This motion might result in injuries or damage to the PTO.

For prevention of injuries and damage to the equipment:

- ✓ Check the drive components of the vehicle.
- ✓ Do not attempt to use drive components without warming up the vehicle.



3. General Rules for PTO Installation



- ✓ Use the appropriate tools and instruments such as torque wrenchs, gauges and thickness gauges.
- ✓ Use only gaskets supplied by the Manufacturer. Use paste gasket only if recommended.
- ✓ Mastic is forbidden if used together with paper gaskets.
- ✓ It is advisable to use medium thread locking fluid for locking bolts and studs.
- ✓ Perform all Installation operations with the vehicle standing on a level surface, otherwise oil levels cannot be checked.
- ✓ Operate with engine and gearbox at ambient temperature.
- ✓ Check that the PTO is equipped with the correct mounting kit.

TIGHTENING TORQUE					
Thread Diameter - Screw (mm)	M8	M10	M12	UNC 3/8	UNC 7/6
Screws and Nuts Torque (Nm)	25	50	80	25	60
Studs Torque (Nm)	6	10	18	10	20

For some aluminium gearboxes, the tightening torque needs to be reduced by 30%. Note on the tightening torque: the tightening torques reported are only meant as a guide and do not replace the indications given by the vehicle's manufacturer or the gearbox manufacturer.

4. Vehicle Mounting of Side&Bottom Mounted PTO

Steps to follow;

1. Take the vehicle to a level ground for installation.
2. Empty the gearbox oil, check cleanliness. If oil is dirty or contaminated it should be replaced. If the level is low, add from the type recommended by the manufacturer in the quantity recommended.
3. The vehicle to be mounted the PTO must be fixed on a suitable platform for the operation (a canal or lift etc.). The parking brake is to be applied, the gear must be in neutral position and the engine is to be stopped.

4. Mount the Studs on the Transmission using suitable torque value. Please also apply threadlocker glue on studs to prevent loosening due to vibration.

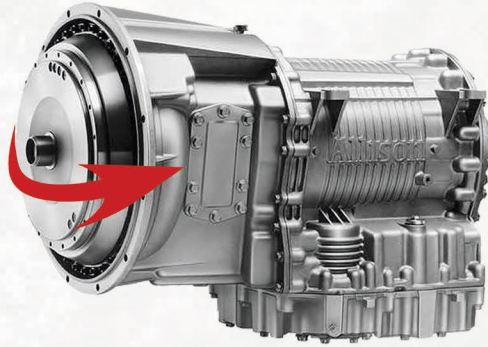
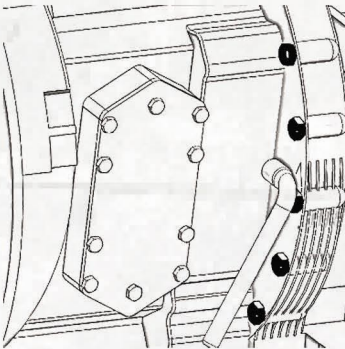


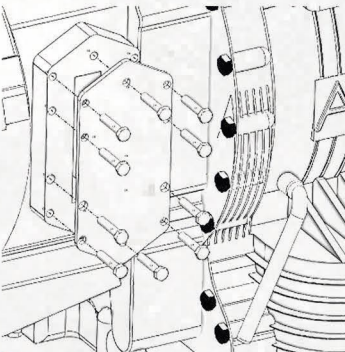
Figure -1- PTO Connection Surface

Figure -2-



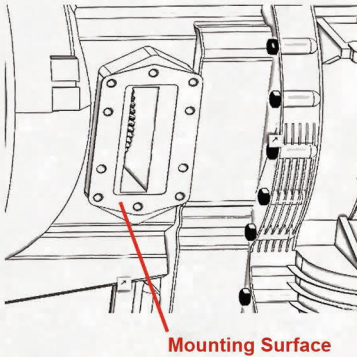
 PTO installation cover. (Figure 2)

Figure -3-



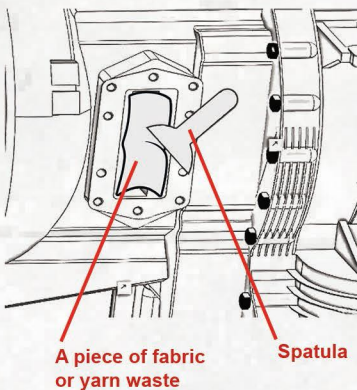
 Remove the bolts and cover. (Figure 3)

Figure -4-



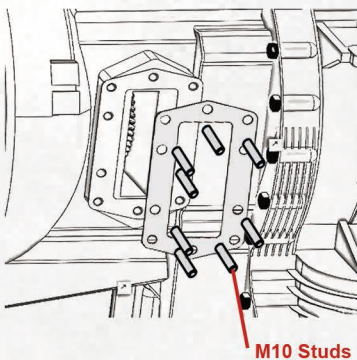
If necessary, use a spatula to clear surface, gasket residue or oil (Figure 4-5)

Figure -5-



Make sure to use a piece of fabric or yarn waste to cover the opening when cleaning the surface to avoid foreign objects entering the transmission. (Figure 5)

Figure -6-



Mount the Studs on the Transmission using suitable torque value. Please also apply threadlocker glue on studs to prevent loosening due to vibration. (Figure 6)

5. During the mounting operation, apply a film layer of grease on the front and rear faces of the gasket, then attach it between the main transmission and PTO connection surfaces.
6. The PTO body is to be mounted on the main transmission surface to allow matching of corresponding gears. The running backlash is checked through the inspection hole on the PTO.
7. Tighten nuts&bolts on the transmission using suitable torque value, Please also apply threadlocker glue on nuts&bolts to prevent loosening due to vibration.
8. Once PTO mounting has been completed, the connection components need to be inspected just in case.
9. The main transmission oil is then poured back into it from the container it had been put into, and then oil plug is fastened (If the oil has expired, new oil must be added).
10. PTO Engaging System will be assembled. (This can be air hoses, control cable&lever or electric wiring, depending on control Type)

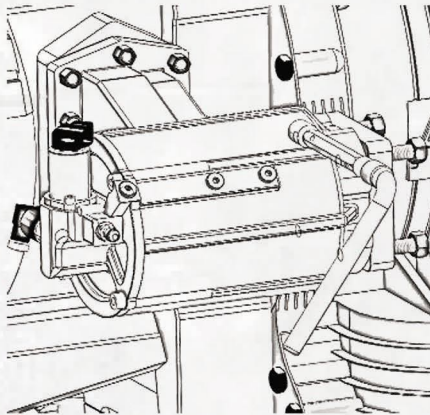


Figure -7-

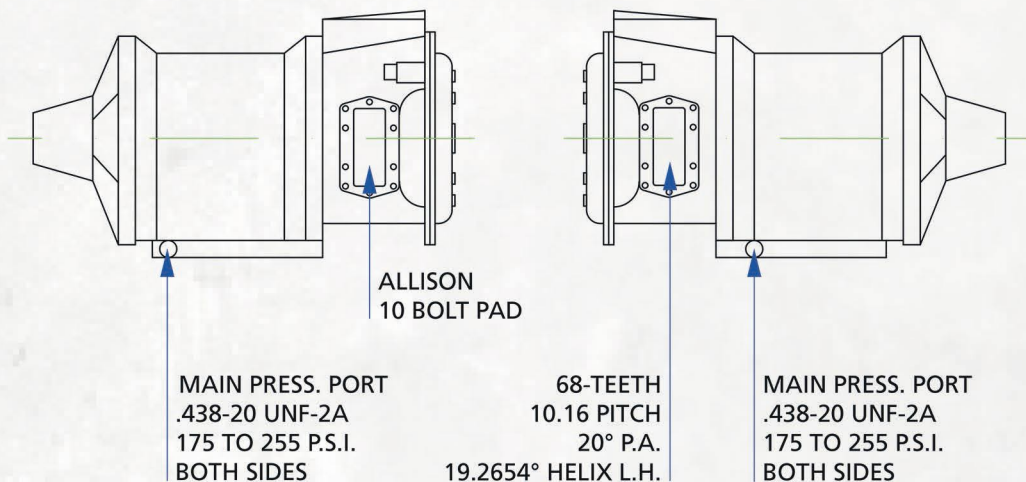
 Once mounting is over, the vehicle needs to be started and kept in idle rotation for about 30 seconds to achieve lubrication of the system. Next, inspect the PTO-Main Transmission connection for oil leakage.

**Backlash inspection hole might not be available on every model.*

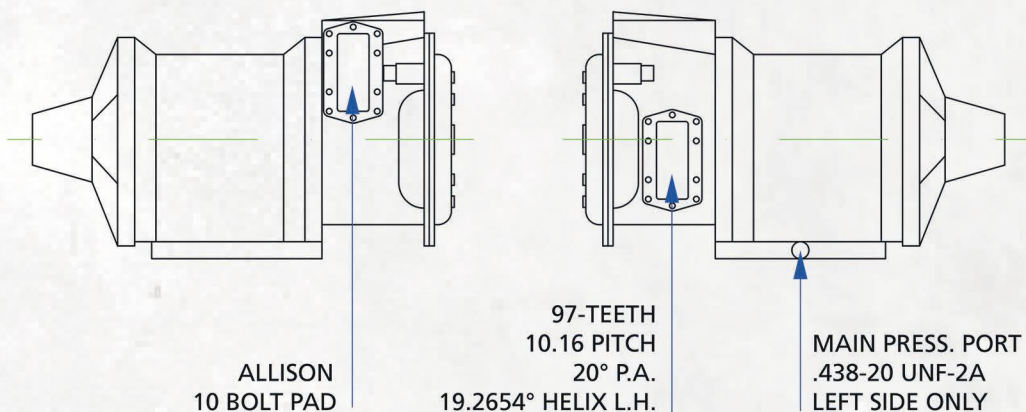
5. Pressure Port and Aperture Identification

ALLISON 3000-4000 SERIES TRANSMISIONS

MD (Medium Duty)



HD (Heavy Duty)



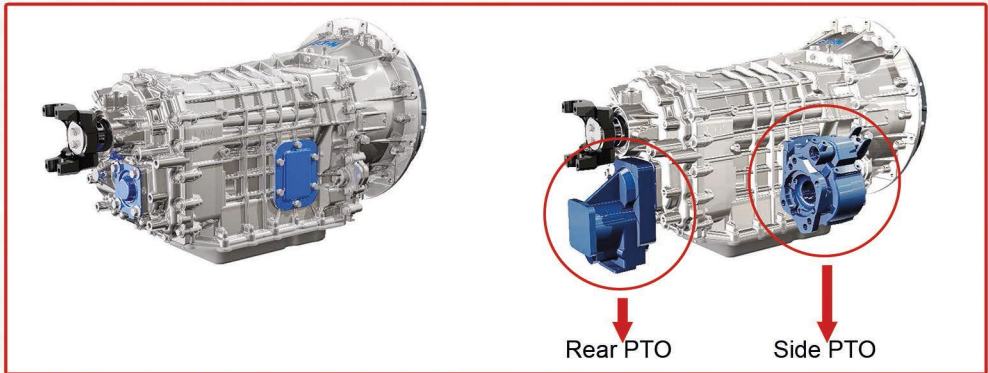
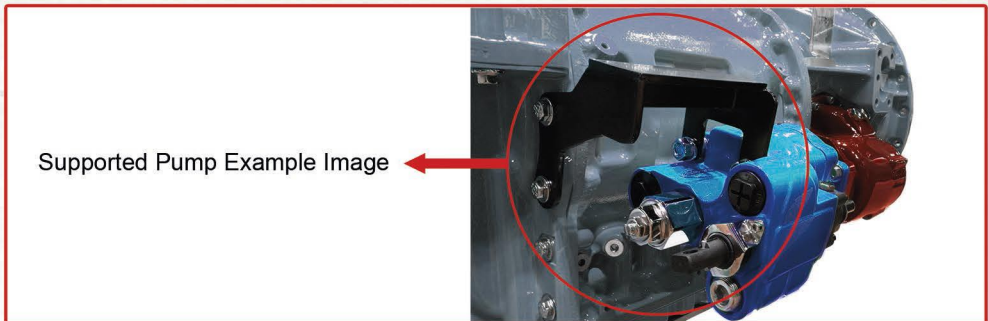


Figure -8- Illustration of Side and Rear Mounted PTOs

11. Run the engine (transmission and PTO in neutral position) for a few seconds and check if there are any unnatural noises. Stay away from rotating shafts and components.

12. In case the hydraulic pump, which will be installed on the PTO, is 40 lbs or heavier and the length is 12" or longer, the pump must be supported by a bracket to avoid damaging the PTO. Otherwise, the PTO will carry all the load and may get damaged over time.



! Once mounting is over, the vehicle needs to be started and kept in idle rotation for about 30 seconds to achieve lubrication of the system. Next, inspect the PTO-main transmission connection for oil leakage.

- ✓ PTO temperature might sometimes have a negative influence, and the temperature needs to be lowered in case of overheating.
- ✓ More frequent oil changes must be conducted in heavy-duty operations.
- ✓ Where the PTO is side-mounted, make sure to inspect the backlash.
- ✓ Where the PTO is rear-mounted and used in heavy-duty operations, extra lubrication must be provided.

6. Points to be Considered During Mounting

6.1 Points Regarding Mechanical PTOs;

It must be definitely ensured when installing PTO control cable that cable support point is located either on the PTO or main transmission. If the installation is done on the chassis, the cable might get damaged or the PTO might accidentally engage due to individual vibration of the chassis and the PTO while the vehicle is moving. In consideration of these points, it must be definitely ensured that the cable is not installed on the chassis.

6.2 Points Regarding Pneumatic PTOs;

The pressurized air from the compressor must be checked. The pressure value should be between 90-116 psi. Water deposits might form inside the air tube due to the moisture while the compressor is running. A separate conditioner (air dryer) must be installed on the compressor to prevent this. To counter both risks, the water deposit inside the air tube must be periodically drained through relief plug. Moreover, it must be ensured that air transmission hoses do not get buckled.

6.3 Points Regarding Vacuum PTOs;

PTO vacuum leakage must be inspected on the PTO and system. It must be ensured that vacuum installation hoses do not get buckled. Vacuum suction value must be inspected. The vacuum value should be between -11 and -14 psi.

6.4 Points Regarding Electric PTOs;

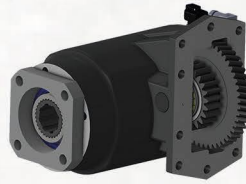
The volt value of the electrical system of the vehicle (12V or 24V) must be determined, and a PTO with a suitable coil should be ordered. Attention must be paid to connecting the (+) and (-) poles of the vehicle accumulator correctly on the coil. Care must be taken to integrate the electrical control unit on the PTO body.

6.5 Points Regarding Hot-Shift (Hydraulic Driven Electric) PTOs;

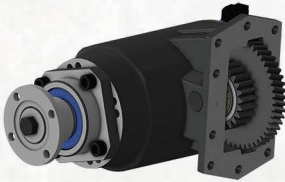
The electrical installation on the vehicle must be integrated with the PTO coil. The oil pressure sensor must be introduced to the vehicle computer while the engine is running after the PTO installation has been completed. Support must be sought from the vehicle main transmission authorized service point for this operation. Otherwise it might cause inefficient operation of the PTO and failure. Also it must be ensured to check coil of the vehicle electrical system (12V, 24V).



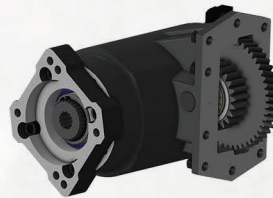
•
Round Keyed Shaft



•
5462 DIN ISO Flange



•
Companion Flange



•
SAE-B Flange

Figure -9- PTO output types

7. Shaft Mounting

The shaft leads to vibrations due to twisting and axial curving. High levels of shaft angle produce potential vibrations and hence negative effects on the components attached to the shaft. Thus, the shaft must be mounted properly as described below.

1. The connection flanges must be parallel to each other and both corner curves must be identical.
2. Sliding and balanced shafts must be used.

3. Shaft angle should be max. 12°

Max. Speed (RPM)	Max. Angle
2500	7°
2000	8°
1500	11°
1000	12°

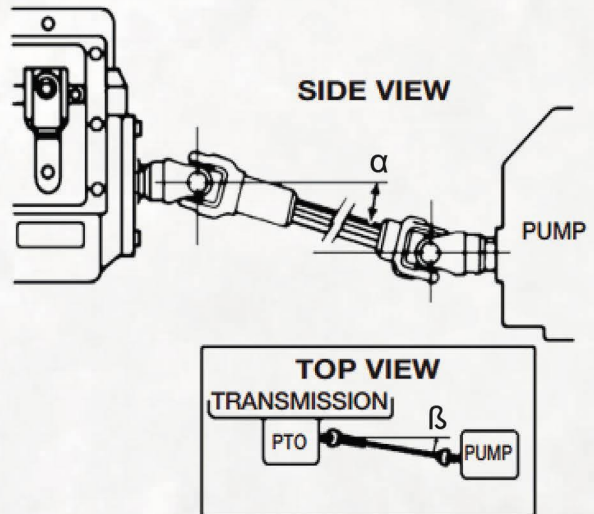


Figure -10-

8. Engaging / Disengaging

During engage/disengage process of the PTO, transmission gears should not run, this will damage the PTO and transmission gears. This is an important part of the process.

8.1 For Manual Transmission Vehicles

Engine runs at idle gear, transmission should be in neutral position

Engage;

1. Press the clutch for 5-7 seconds,
2. Activate PTO (depending on control type, pneumatic, electric..etc),
3. Release the clutch pedal slowly.

Disengage;

1. Press the clutch for 5-7 seconds,
2. Activate PTO (depending on control type, pneumatic, electric..etc),
3. Release the clutch pedal slowly.

****Do not forget to disengage the PTO before the vehicle moves.***



****For automatic transmission, depending on gearbox features, procedures might change. Please contact your truck supplier to get guidance, or contact us with information about the automatic transmission model.***

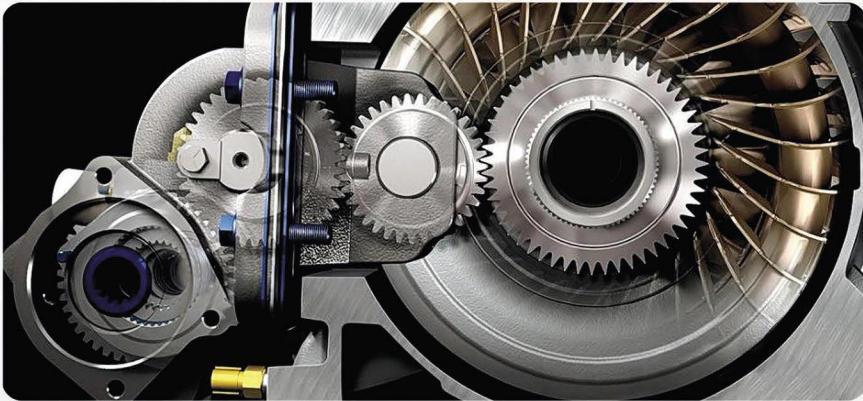


Figure -11- Transparent View of the PTO and Main Transmission

9. Servicing and Maintenance

Oil Leakage Detection

Check for oil leakage periodically. Watch for oil leakage at vehicle operation site or surroundings. Upon detecting leakage, take required action. After checking the available oil level, add oil into the main transmission where necessary. Contact us if the oil leakage persists in spite of the intervention.

MATERIALS WHICH REQUIRE REPLACEMENT FOR MAINTENANCE

- ✓ Do not forget that this is a technical product, and change there placement parts on time for its maintenance.
- ✓ The sealing components (orings, seals etc.) must be replaced once a year or every other year depending on the intensity of operation.
- ✓ The bearings might be needed replaced in 2-4 years depending on the frequency of operation.



Contact us in case of a technical failure. Removal of the PTO by someone other than authorized technician or notified servicing point would put the equipment out of warranty coverage.



10. Precautions for Emergency

If the PTO is to be disengaged in case of emergency, this must be done through the emergency stop system to be installed by the superstructure manufacturer.

11. Actions for Potential Failures

Issues	Likely Cause	Remedy	Precaution
PTO does not Engage/Disengage	Pneumatic pathway might be soiled or clogged; otherwise the hose might be twisted or bent.	Clean the pneumatic hose. Eliminate the twists or bends if any. Replace if required.	Check pneumatic hoses. Take precautions against cracking, puncture and twisting. There should be a conditioner (air dryer) on air compressor.
PTO does not Engage/Disengage	There is not enough pneumatic or vacuum pressure.	Check if the pressure is 90-116 psi before running the PTO. The vacuum pressure must - 11/-14 psi.	Inspect if there is any issue with the pneumatic or vacuum system.
PTO does not Engage/Disengage	The clutch, synchromesh or gear might not have matched its position when putting into gear.	Fully press the clutch pedal before engaging the PTO and properly engage the PTO once the assembly gear stops.	Always make sure to follow the instructions in the usage manual.
No air in the PTO	Control mechanism worn out or damaged	Check the control mechanism. Replace any damaged part.	Contact us if the problem persists.
No air in the PTO	Air compressor might be damaged.	Check the air pressure. It must be 90-116 psi.	Contact the vehicle servicing point
No air in the PTO	Pneumatic valve might have failed.	If the pneumatic hose is intact make sure that the air is available by removing the hose from the fitting and engaging/disengaging the mechanism.	If there is no air, then replace the solenoid valve that controls the pneumatic system.

Issues	Likely Cause	Remedy	Precaution
Oil leakage in the PTO	Gasket deformed or product life expired.	Replace if deformed or expired.	Install the gasket as per the instructions. Replace if damaged.
Oil leakage in the PTO	Gasket missing or wrong gasket used	Use the gasket that comes with the PTO. Ask the manufacturer if required.	Do not use any other method for sealing other than the original gasket.
Oil leakage in the PTO	Diverging from the mounting instructions provided by the manufacturer.	PTO to be installed according to the instruction.	PTO needs to be installed by trained personnel.



Contact us in case of a technical failure. Removal of the PTO by someone other than authorized technician or notified servicing point would put the equipment out of warranty coverage.

12. Warranty

12.1 Warranty Terms

1. Warranty period is one (1) year from the delivery of the product.
2. In the event that the product fails during the warranty period, the following apply;
 - Failure repair time is 1 to 8 working days depending on it's nature.
 - Where the repair time lasts more than 7 working days (except transportation time), a new product shall be supplied to the customer till the failure has been repaired.
3. Where a failure occurs within the warranty period because of manufacturing fault, the product shall be repaired free of charge.

12.2 Situations Which Terminate Warranty Obligations

The warranty obligations shall become null and void in following situations;

- Using the product for a purpose other than the intended use,
- Changes to the product that are not approved by us,
- Digression from defined specifications and reference limits,
- Failing to perform indicated product maintenance,
- Having a repair, carry out maintenance works or replace parts of the product service provide, other than the Authorized Service Point within the warranty period.
- Using the product against the usage terms set forth in the usage instructions,
- Where the product is damaged due to the improper mounting,
- Contact us in case of a technical failure. Removal of the PTO by someone other than Authorized Technician or notified servicing point would put the equipment out of warranty coverage.



9001:2015



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