



TWISTER

INSTALLATION

&

OPERATION MANUAL

T40 – T60

COPY DATED 08/24

Serial No. _____

Engine SN _____

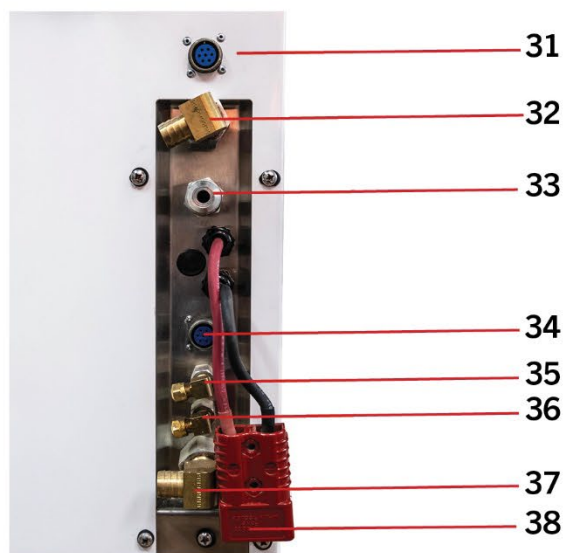
Compressor SN _____

Control Box SN _____

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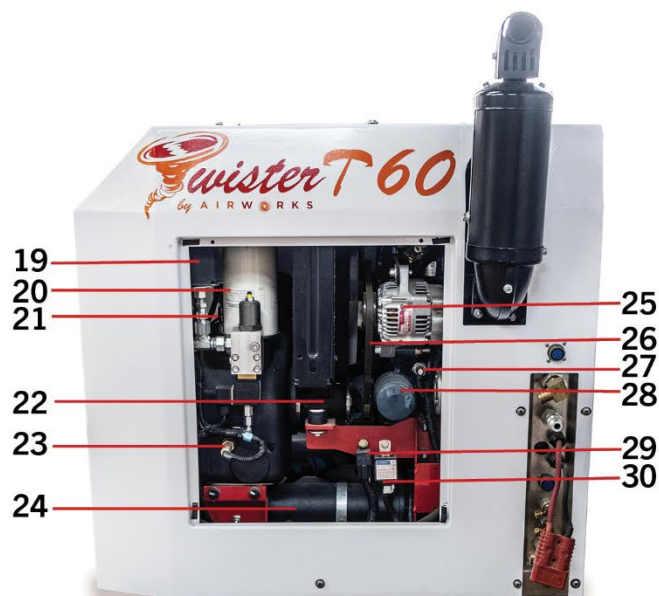
MOBILE AIR COMPRESSION

Unit Diagram



Twister T40/T60

1. Coolant Reservoir
2. Compressor Oil Filter
3. Oil Scavenging Return Line
4. Engine Air Filter (Obscured)
5. Positive Air Shutoff (Obscured, Optional Feature)
6. Fuel Stop Solenoid
7. Valve Lash Cover
8. Intake Heater
9. Idle Solenoid
10. Engine Oil Dipstick
11. Hour Meter
12. Electric Fuel Pump
13. Fuel/Water Separator Filter
14. Engine Oil Drain Hose (Obscured)
15. Radiator
16. Compressor Air Intake
17. Compressor Oil Fill
18. Compressor Oil Drain Hose
19. Pressure Switch
20. Coalescing Filter
21. Pressure Relief Valve
22. Drive Coupler
23. Compressor Temperature Probe
24. Heat Exchanger
25. Alternator
26. Fan Belt
27. Engine Temperature Probe
28. Engine Oil Filter
29. Fuel Stop Shutdown Relay
30. Fuel Stop Timer
31. Autostart Connector (Optional Feature)
32. Coolant Tie-In Supply Line (Optional Feature)
33. Compressed Air Output
34. Control Panel Connector
35. Fuel Supply
36. Fuel Return
37. Coolant Tie-In Return Line (Optional Feature)
38. Battery Quick Connect



Installation Instructions

Important: Read and understand this manual before installation.

1. Preparation

- Trace the base size and mount hole locations onto cardboard to create a template. Use this template to drill holes for mounting the compressor in a suitable location. Exercise caution when drilling to avoid obstacles beneath the surface.
- Allow for proper fitting and hose/wire routing. Ensure there is adequate space for ventilation and service access.

2. Mounting the Compressor

- Securely fasten the compressor to the service body using the 4 holes provided in the base and locking fasteners.
- Mount the Twister control panel in an accessible location. For extended length locations, use extension (Part Number AOCBH10).

3. Fuel Line Installation

- Run supply and return fuel lines to the truck diesel fuel tank using the auxiliary pickup provisions on the tank. **Note:** Do not cut into the truck engine lines. Consult the vehicle manufacturer for the proper procedure and use kit (Part Number ATA013).
- Prevent fuel line rubbing/pinching when the vehicle is in motion and avoid any contact with hot or moving parts.
- If the electric fuel lift pump (#12)¹ on the Twister is added near the fuel tank on long fuel line runs or for high lifts (over 3 feet) and long runs (over 6 feet), an auxiliary fuel pump (Part Number AOF003) is available for long fuel line runs.

4. Battery Connection

- Use a minimum of 4-gauge welding wire with a 150-amp breaker in line when connecting the battery cables to the Twister. Due to the rubber mounting bases, ground the unit using the supplied ground lead from the Twister to the chassis battery.
- Run the battery cable from the Twister quick connector (#38) to the truck battery. Install a 150-amp circuit breaker near the battery and size the cable appropriately for the length of the run. Protect the cable from rubbing and damage. Fine strand welding cable is recommended. (We offer an electrical tie in kit that provides everything that you need for this (Part #AOB012).)

¹ Numbers correspond with Unit Diagram on page 1

5. Air Line Restrictions

- Limit the use of 45-degree and 90-degree fittings to three or fewer to prevent loss of airflow. Use at least 3/4" hose/plumbing throughout the system.

6. Airflow Considerations

- When installing the Twister in a confined space, ensure proper airflow direction through the unit. Provide a source of fresh air intake for engine and compressor (#16, #4)² and a vent for warm air exit (At rear of Twister, closest to the exhaust). Ensure hot air is not redirected into the cooling air stream.

7. Cooling System

- If connecting the truck cooling system to the Twister, use Airworks' Cold Weather Package, (Part Number ATO112). **Note:** Any alteration to the Twister cooling system will result in a void warranty!
- Operating the unit with a low coolant level will cause damage not covered by the warranty.
- Use only Airworks coolant (Part Number ATE123)

7.1 Coolant Fill Instructions When Using Coolant Tie in Kit

- **Safety First:** Never open the coolant system when hot!
- **Before You Start:**
 - Ensure the chassis engine and coolant tank are cold.
 - Coolant tank (#1) should be no more than 1/3 full.
- **Chassis Coolant:**
 - Verify coolant is at the manufacturer's recommended level.
 - If low, top up with Airworks Coolant (Part Number ATE123).
- **Twister Coolant:**
 - Open the Twister radiator cap slowly.
 - Ensure coolant is ½ inch above the radiator core.
 - Add coolant if needed, but do not overfill. Coolant expansion tank should be 1/3rd full.
- **System Check:**
 - Run the Twister or chassis engine, then let allow the system to cool.
 - Recheck and adjust coolant levels at the Twister as needed.
- **Final Adjustment:**
 - If overfilled on the vehicle side, ensure that the Twister's coolant is low. This will equalize your coolant levels.
 - Power down your chassis and Twister and allow it to cool. Recheck coolant levels, and adjust as needed.

² Numbers correspond with Unit Diagram on page 1

Minimum Safety Guidelines

Before Operating the Compressor:

1. Read and Understand Manual:

- Ensure you read and comprehend the operation manual and all related safety materials before operating the air compressor. The installer must ensure that the manual and all safety decals are delivered with the unit upon completion of product installation.

Personal Protective Equipment and Practices:

2. Use Appropriate Safety Gear:

- Follow safe work practices and wear the appropriate safety equipment when operating air-powered equipment.

3. Noise Hazard:

- Wear appropriate hearing protection to prevent hearing damage from high noise levels.

4. Chemical Exposure:

- Use appropriate personal protective equipment (PPE) when handling lubricants, coolants, or other chemicals. Ensure proper ventilation in the work area.

Operating Precautions:

5. Avoid Drive System Contact:

- Do not operate the compressor with panels removed. Avoid contact with the drive system.

6. Avoid Pressurized Air Contact:

- Avoid skin contact with pressurized air, as it may cause injury or death.

7. Ensure Air Quality:

- Make sure the air entering the compressor is free of flammable vapors to prevent explosions.

8. Vaporized Oil Hazard:

- Be aware that vaporized oil propelled by high-pressure air is an explosive mixture and a respiratory hazard.

9. Hot Components:

- Use caution when handling components during and after operation, as they may be hot.

10. Electrical Safety:

- Ensure all electrical connections are properly insulated and grounded. Do not operate the compressor with wet hands or in wet conditions.

Refueling and Fire Safety:

11. Refueling Precautions:

- Never refuel the unit while it is running or hot. Avoid sparks and flames when refueling. Only refuel in well-ventilated areas.

12. Fire Hazard:

- Keep flammable materials away from the compressor. Have fire extinguishers readily available and know how to use them

Preventing Accidents:

13. Falling Objects:

- Secure all components and tools properly to prevent them from falling. Wear a hard hat in areas where overhead work is being done.

14. Slips, Trips, and Falls:

- Keep the work area clean and free of obstructions. Ensure that hoses and cables are routed safely to avoid tripping hazards.

15. Moving Parts:

- Keep hands and clothing away from moving parts. Ensure all guards and covers are in place during operation.

16. Proper Lifting Techniques:

- Use proper lifting techniques or mechanical lifting devices when moving heavy components to prevent back injuries.

Depressurizing Prior to Servicing:

18. Depressurize System:

- Do not attempt to service the compressor while it is under pressure. Remove fill caps and filters slowly

When Servicing the Unit:

1. Do Not Bypass Safety Devices:

- Do not bypass any of the unit's safety shutdown devices.

2. Avoid Extreme Heat:

- Do not expose the unit or its components to extreme heat.

3. Depressurize Before Service:

- Do not repair or service a pressurized system.

4. Pressure Relief Valve:

- Do not tamper with the pressure relief valve.

5. No Modifications:

- Do not attempt to modify any component.

6. Power Disconnection:

- Ensure power is disconnected to prevent the compressor from starting unexpectedly.

Safety Features:

1. **200 PSI Relief Valve:**
 - The unit includes a 200-psi relief valve.
2. **Temperature Safety Shut Down:**
 - There is a temperature safety shutdown feature on both the engine and compressor.
3. **Rapid Blow Down Valve:**
 - This valve discharges system pressure on the compressor side after shutdown.
4. **Low Oil Pressure Shut Down:**
 - The engine has a low oil pressure shutdown feature.
5. **Outer Enclosure:**
 - An outer enclosure prevents contact with hot and moving parts.
6. **Optional Low Coolant Sensor:**
 - The optional low coolant sensor is included in the cold weather coolant tie-in kit (Part #AOCW20).
7. **Warning Decals:**
 - Warning decals are to be installed throughout the unit for added safety.

How a Rotary Screw Compressor Works

The system uses a flooded lobe, rotary screw compressor. This type of compressor contains a male and female rotor turning at a fixed speed. Here's a step-by-step overview of its operation:

1. Air Intake:

- Air at atmospheric pressure is introduced into the housing, where it is trapped between the turning rotors, allowing for compression to take place.

2. Compression:

- A lubricated pitch line provides sealing. As the lobes on the rotors mesh, they reduce the volume of air, compressing it to the desired pressure.

3. Oil Separation:

- Oil separation occurs in two stages:
 - **Stage One:** Mechanical separation, where the air/oil mixture is first separated through a series of baffles.
 - **Stage Two:** Coalescing filter, which further separates the oil from the compressed air.

4. Cooling System:

- The compressor's cooling system maintains the compressor oil temperature. This system uses the cooling system of the prime mover to act as a heat sink for heat transfer and may use an air-to-liquid cooler or liquid-to-liquid heat exchange.

5. Machining Tolerances:

- Rotary screw compressors are machined to close tolerances. Ingestion of foreign objects into the system can rapidly damage or shorten the life expectancy of the unit.

Maintenance Schedule

To maintain your system and warranty, follow the maintenance schedule using only Airworks genuine replacement parts. Proper air filtration and clean oil are crucial for preventing contamination that can damage roller bearings, gears, and rotors. Ensure the compressor air pressure is completely unloaded before servicing, and clean areas to be serviced. Remove fill caps and filters slowly.

Every 25 Hours

- Check compressor oil (appropriate level is at the bottom of the threads inside compressor oil fill), engine oil, and coolant levels.
- Check for loose or rubbing components, leaks, air, and fluid.

Every 100 Hours

- Perform 25-hour checks plus:
 - Check air filter elements' condition (#4, #16)³.
 - Check fan belt tension (#26).
 - Check fuel filter (#13).

Every 250 Hours

- Perform 100-hour checks plus:
 - Change engine oil (6 quarts) and oil filter.
 - Change compressor oil (10 quarts), oil filter, and air filter.
 - Service engine and compressor air filters.
 - Check hoses and clamps.
 - Inspect coupler on engine and compressor; replace if required.
 - Check for leaks, loose fasteners, fittings, wire, and hose chafing.

Requires:

- Twister T40/T60 250 Hour Service Kit (Part Number ATS425S)
 - Compressor Air Filter (Located within #16) (Part Number ATC002)
 - Compressor Oil Filter (#2) (Part Number ATC003)
 - Engine Air Filter (Located within #4) (Part Number ATE027)
 - Engine Oil Filter (#28) (Part Number ATE028)
 - 1 Liter Synthetic Compressor Oil (Part Number ATC005)
 - 1 Liter Synthetic Engine Oil (Part Number ATE021S)
 - Fuel Filter (#13) (Part Number ATE007)

³ Numbers correspond with Unit Diagram on page 1

Every 500 Hours

- Perform 250-hour checks plus:
 - Change compressor coalescing filter (#20)⁴.
 - Replace fan belt (#26).
 - Check radiator hoses and clamps.
 - Check air intake lines.
 - Replace the fuel filter element (#13).
 - Clean the radiator external fins.
 - Check valve lash (Located under tappet cover on top of engine at #7).

Requires:

- Twister T40/T60 500 Hour Service Kit (Part Number ATS450S)
 - Compressor Air Filter (Located within #16) (Part Number ATC002)
 - Compressor Oil Filter (#2) (Part Number ATC003)
 - Engine Air Filter (Located within #4) (Part Number ATE027)
 - Engine Oil Filter (#28) (Part Number ATE028)
 - 1 Liter Synthetic Compressor Oil (Part Number ATC005)
 - 1 Liter Synthetic Engine Oil (Part Number ATE021S)
 - Fuel Filter (#13) (Part Number ATE007)
 - Fan Belt (#26) (Part Number ATB035)
 - Coalescing Filter (#20) (Part Number ATC004)
 - Coupler Insert (#22) (Part Number ATC020)

⁴ Numbers correspond with Unit Diagram on page 1

Start-Up/Shut Down Procedure (With Autostart Option)

Turning On the Unit

- Ensure that 'COMPRESSOR' button is turned off.
- Turn key to the start position to power on the unit.
- Press 'RUN' to start your Twister's engine.
- Allow the engine to get to a smooth idle.
- Press the 'COMPRESSOR' button to begin building air.
- The unit will idle down once maximum pressure is reached. The unit is now ready to use.

Shutting Down the Unit

- Ensure that compressor is not under load (Currently building air). Deactivate the 'COMPRESSOR' button.
- Press 'OFF' to turn off the Twister's engine.
- Turn the key to the center position. The unit is now turned off.



Auto Start

Activate this feature by pressing 'AUTO'. This will automatically shut off the engine when max air pressure is reached, and turn on again when more air is needed.

Aux Button

By default, the aux button is left available for the installer to integrate as a control for other systems.

ENTER/Up/Down

The screen will cycle through a variety of system parameters, such as PSI, temperature, oil pressure. Use the arrows to navigate through this list. To prevent the screen from cycling, you can lock the current view by holding 'ENTER'.

Status Light

Green: Everything is working correctly.

Red: The engine has thrown an error code. This code will be visible on the screen.

IMPORTANT: Avoid shutting the engine off or the compressor button while the unit is building pressure. This may cause oil loss and/or damage to your compressor.

Start-Up/Shut Down Procedure (Manual Start)

Twister T40/T60s come standard with a simple control box featuring a keyed switch, a 'Compressor' button, and an 'Aux/Idle' button.

Starting Your Twister

- Ensure that it is safe to start the compressor.
- Turn key on the control box to the right to crank the engine.
- Wait a few moments for the engine to achieve a smooth idle.
- Press the button labeled 'Compressor' to begin building air.
- Wait for the tank to get up to its maximum pressure (Typically 150 PSI, unless otherwise adjusted).
- Your Twister is now ready to be used.

Turning Off Your Twister

- Ensure that the compressor is not currently building pressure.
- Press the 'Compressor' button to disarm the compressor.
- Allow the unit to idle down for a brief moment to help cool it down.
- Turn the key switch to the off position to turn off the engine.
- Your Twister is now turned off.

IMPORTANT: Avoid shutting the engine off or the compressor button while the unit is building pressure. This may cause oil loss and/or damage to your compressor.

Adjusting the System

Your Twister has been designed to continuously run tools requiring roughly 90 PSI. In the event that either of these values have drifted, they can be brought back to our spec with some simple adjustments.

Setting the PSI

The pressure switch (#19) can be adjusted between 130-165 PSI. This component determines the cut-in and cut-out pressure of your compressor. If you would like to go beyond this range, please contact us at 780-454-2263.

Setting the engine speed

The engine speed is maintained by the engine's internal ECU. While this speed can be modified, this process requires that the ECU be reprogrammed by one of our trained technicians.

IMPORTANT: There are additional safety and performance considerations to be made when adjusting either of these components. We advise you to contact us at 780-454-2263 to speak with a trained technician before attempting this on your own.

Determining Custom Specs

If you need to set up a system without knowing its demands, you can make adjustments by using an orifice in the outlet to simulate tool use. A system testing and adjustment tool is available from Airworks (ATT001).

Troubleshooting

Below are a variety of commonly observed air compressor issues, along with steps to identify or solve each one.

Compressor Does Not Produce Adequate Air

Check and correct the following:

1. Ensure the compressor oil level (#17)⁵ is correct.
2. Confirm the pressure relief valve (#21) is operational.
3. Ensure air filters (#4, #16) are clean.
4. Check for any blockages downstream of the compressor (e.g., kinked hose or compromised plumbing).
5. Verify the engine RPM is set to spec; adjust as required.

Frequent Over-Temperature Shutdowns

Check and correct the following:

1. Verify engine and compressor oil levels (#10, #17) are correct.
2. Check the engine coolant level (#1) while the unit is cool.
3. Inspect engine and compressor hoses for kinks.
4. Check the over-temperature shutdown temperature probes (#23, #27) for both the engine and compressor.
5. Ensure adequate air circulation around the unit and confirm that hot air is not being recirculated into the air intakes (#4, #16).
6. Make sure oil filters (#2, #28) are not plugged.
7. Verify the fan belt (#26) is properly adjusted.
8. Clean the radiator (#15) core with caution using compressed air, ensuring not to damage the fins.
9. Check for a faulty over-temperature switch on the engine (240°F) or compressor (270°F).
10. Look for rapid compressor cycling which might indicate air volume exceeds usage.

Excessive Air Pressure

Check and correct the following:

1. Ensure the pressure relief valve (#21) is operating correctly.
2. Confirm the inlet valve (Located beneath air filter within #16) is sealed properly and there is no oil in the compressor air filter inside of it.
3. Ensure the pressure switch (#19) is operating correctly.
4. Inspect the system pressure line for leaks (from compressor to pressure switch).

⁵ Numbers correspond with Unit Diagram on page 1

Engine Stalls When Compressor Starts

Check and correct the following:

1. Ensure the air compressor is not under pressure – allow it to unload.
2. Verify the engine speed is adequate. Refer to the 'Adjusting the System' section of the manual.
3. Confirm air intake valve (Located beneath filter within #16)⁶ is operating properly.
4. Ensure the engine fuel filter (#13) or air filter (Located within #4) is not plugged; replace if necessary.
5. Check if the fuel pump (#12) is functioning.
6. Verify the compressor switch is off during startup.
7. Inspect the positive air shut-off valve (#5 (optional – not on all units).

Low Air Pressure

Check and correct the following:

1. The maximum air flow may be exceeded. Try running the compressor with a lighter load and observe its operation.
2. Verify the engine speed is adequate. Refer to the 'Adjusting the System' section of the manual.
3. Ensure the pressure relief valve (#21) is operating properly – adjust or replace as required.
4. Check for restricted flow due to kinked or collapsed air lines or ice blockages.
5. Inspect air lines and fittings for leaks.

Excessive Oil in the Air Produced

Check and correct the following:

1. Verify the compressor oil level (Check level by opening #17) is correct.
2. Ensure the oil scavenging return line is clean (#3)
3. Inspect the coalescing filter (#20) and replace it if necessary.
4. Ensure the shutdown procedure is proper; avoid shutting down under load.

Diesel Engine Turns but Will Not Start

Check and correct the following:

1. Ensure there is an adequate fuel supply (minimum 4 psi running).
2. Confirm the compressor switch is turned on.
3. Test the intake heater (#8).
4. Check if the fuel filter (#13) is restricted; bleed air from the filter housing.
5. Inspect the positive air shut-off valve (#5) (optional – not on all units).
6. Verify fuel pump (#12) operation and check flow.
7. Bleed air from the fuel system through the screw at the top of the filter.

⁶ Numbers correspond with Unit Diagram on page 1