



Magnetic

**Vehicle Exhaust Ventilation
System**

Horizontal Flex Track

SFTM

***MAINTENANCE
&
OPERATION MANUAL***



Phone 1 (800) 875 - 5440

MAGNEGRIP VEHICLE EXHAUST VENTILATION SYSTEMS



Congratulations! You have made a major investment in the protection of your fire company's health by installing the most technologically advanced diesel exhaust system on the market today.

Clean Air Concepts has strived to bring a system to the market that is not only innovative but also user and maintenance friendly. We believe that with the few routine adjustments required to maintain the optimal performance of the MAGNEGRIP System, you'll agree that we have achieved our goal.

The following pages will explain the maintenance and adjustments needed to keep your system operating at peak performance.

If you should have any question or need assistance please call 1(800) 875-5440 (ext. #119)

WHY GETTING TO KNOW YOUR DIESEL EXHAUST SYSTEM IS IMPORTANT!

The MAGNEGRIP Vehicle Exhaust System has been designed and engineered to be the most user and maintenance friendly system available. As with all equipment a certain amount of maintenance is necessary to retain optimal performance. Your exhaust system is no exception.

It is important that you read and understand the operation and maintenance material supplied to you upon completion of your system. You must get to know the diesel exhaust system and use it just the same as any other equipment you are required to use on a daily basis for your protection and the protection of others.

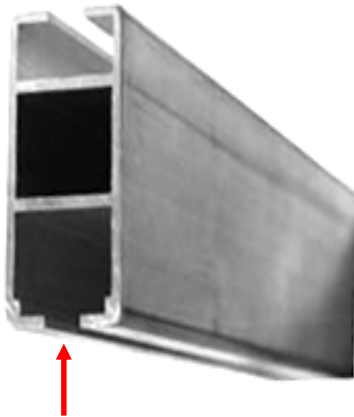
It is a proven fact that diesel exhaust emissions are carcinogenic and a major threat to everyone's health. The proper use and maintenance of your MAGNEGRIP System will significantly reduce or eliminate the exposure to harmful emissions.



Remember, just like your fire protection gear the MAGNEGRIP Vehicle Exhaust System is the most beneficial when properly used and maintained.

1:1 TRACK MAINTENANCE

The channel of the track in which the Flex Hose travels should be cleaned and lubricated every six months.



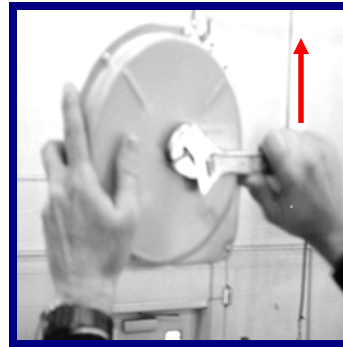
CLEAN AND LUBRICATE THE TROLLEY
CHANNEL WITH A SILICONE SPRAY

Use a sponge saturated with a silicone spray to remove particulate build-up in the track.

IMPORTANT: Do not use WD40, grease or any other lubricant that will pickup and retain particulate. Use only a silicone spray.

2:1 BALANCER ATTACHMENT AND ADJUSTMENT PROCEDURE

The balancer is used to retract the hose after the vehicle exits the bay. It is a locking balancer and has approximately 40' of cable. On the cable near the end of its travel is a yellow tab. The tab is used to indicate the position in which the cable is to be locked before the nozzle is attached to the tailpipe of the apparatus. For proper operation the cable is to remain in the locked position when attached to the tailpipe adaptor



ROTATE SHAFT
COUNTERCLOCKWISE

The balancer is attached to the trolley by using the H-swivel clevis hook provided. Raise the hose and attach the lifting elbow snap hook to the balancer cable and perform the following adjustments:

BALANCER ADJUSTMENT: After attaching the lifting elbow to the cable, if the rubber stop does not touch the balancer housing when the cable is trying to retract, use a wrench on the flats of the mainspring shaft. Rotate the shaft counterclockwise until the rubber stop contacts the housing.

IMPORTANT: DO NOT ATTEMPT TO ADJUST THE BALANCER TENSION WITH THE CABLE IN A LOCKED POSITION.



IMPORTANT: It is recommended that a safety cable be used between the trolley and the balancer.

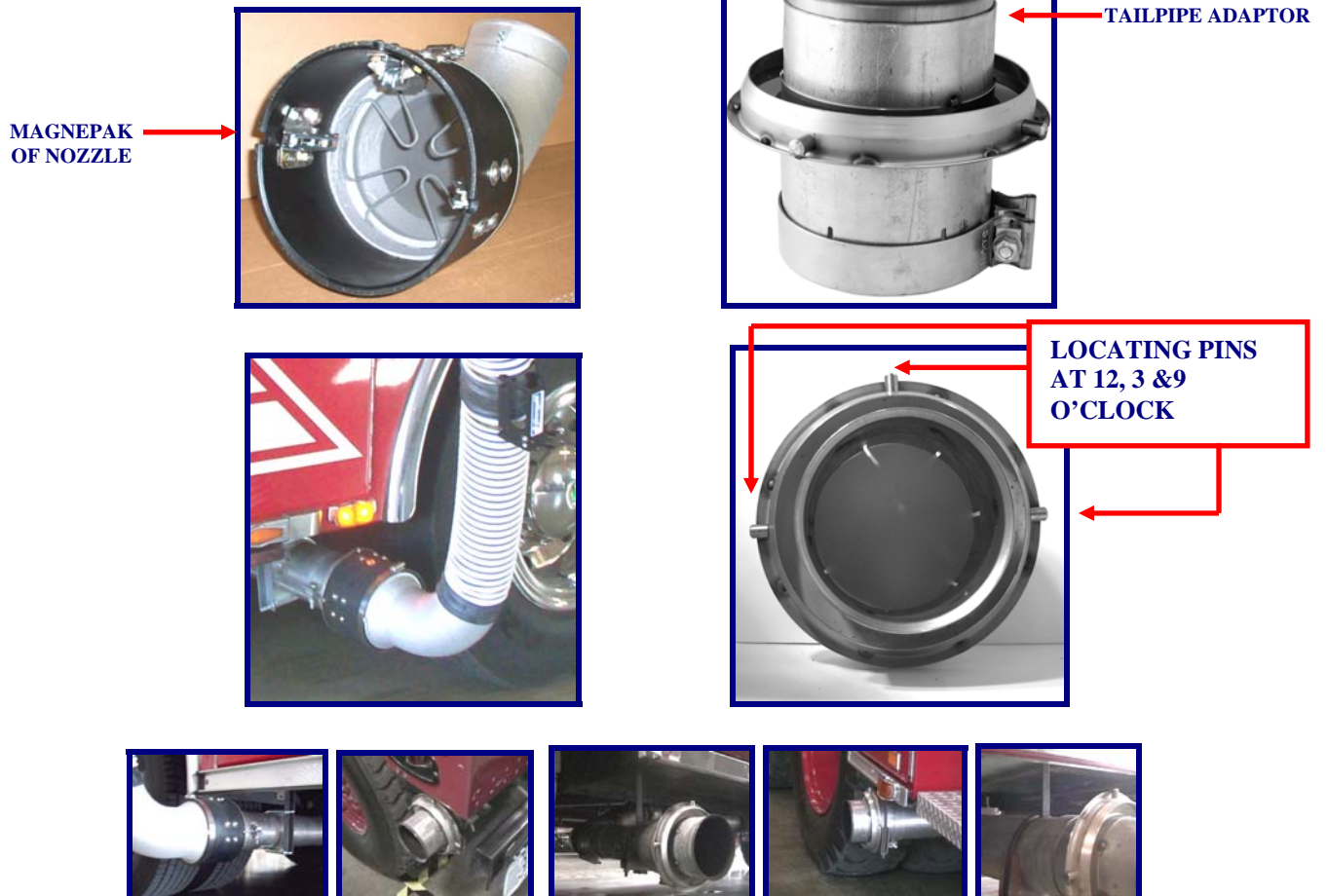
3:1 NOZZLE/TAIPIPE ADAPTOR ATTACHMENT PROCEDURE

The nozzle is used to make the final connection from the spiral duct and flexible hose to the apparatus. It employs the use of rare earth magnets and specially designed cases, referred to as “MAGNEPAKS”. The nozzle mates with a specially designed tailpipe adaptor that attaches to the vehicle exhaust.

The nozzle has 3 notches at 12, 3 & 9 o'clock. The notches mate with 3 locating pins on the tailpipe adaptor to ensure proper positioning of the “MAGNEPAKS”.

The tailpipe adaptor incorporates an ambient air inlet ring with a heat resistant gasket. The gasket serves a check valve in positive air pressure (i.e.: fan not running while engine is on). The ambient air inlet ring allows the system to pull-in cooler ambient air from outside the engines exhaust when the fan is running. This feature lowers the temperature of the exhaust emissions extending the life of the hose. The ambient air inlet ring also reduces the chance of damage to turbo-chargers that could occur with systems that do not offer this design.

IMPORTANT: The tailpipe adaptor must be installed with the locating pins positioned at 12, 3 & 9 o'clock for proper detachment of the nozzle.



IMPORTANT: All tailpipes must be provided with a rigid brace attached to the underbody of the vehicle as pictured above.

4:1 NOZZLE & TAILPIPE ADAPTOR MAINTENANCE:

CLEANING AND INSPECTION -

The tailpipe adaptor should be maintained so as not to allow a build up of road dirt or salt on it. A build up could keep the magnets from making proper contact with the adaptor thereby reducing the systems performance. It is suggested that the adaptor be cleaned each time the apparatus is washed. For heavy build-up steel wool may be used to clean and smooth the surface.



Keep this area clean

Note: When cleaning the “Tailpipe Adaptor” inspect for any possible damage that may hinder the systems performance. A damaged flange could prevent the nozzle from properly attaching and/or releasing.

The nozzle should be inspected and cleaned to keep the “MAGNEPAKS” from collecting a build up of metal shavings and/or dirt on the pull-pieces. A build up could keep the magnets from making proper contact with the adaptor thereby reducing the systems performance. It is suggested that a clean wire brush be used in a back and forth motion to remove debris. The nozzle should be cleaned and inspected on a monthly basis.



NOZZLE

Note: When cleaning the “MAGNEPAKS” inspect the pull pieces for wear. If the nozzle and adaptor are clean and undamaged but the nozzle is not traveling to the exit point consistently worn pull-pieces are usually the culprit. The pull-pieces are a normal wear item and are easily replaced.



Pull-Pieces Replacement:

To replace the pull-pieces remove the rubber boot from the elbow transition. Each “MAGNEPAK” is secured to the boot with four bolts and lock nuts. Removing one of the bolts is necessary to allow the pin that secures the pull-pieces to be removed. Using a 7/16” wrench and a 5/16” hex key remove the bolt. Then remove the snap ring that secures the pin and slide the pin out of the “pak”. The pull-pieces/magnets assembly can now be removed. Remove the magnets from the pull-pieces and transfer them to the new pieces and reassemble.

IMPORTANT: When transferring the magnets to the new pull-pieces they must be placed so that each magnet wants to push away from each other. This is needed to attain the proper polarity for the attraction strength of the magnet assembly to the tailpipe adaptor.



5:1 STANDARD FLEXIBLE HOSE ASSEMBLY WITH HANDLE & 5PLY LOWER SECTION

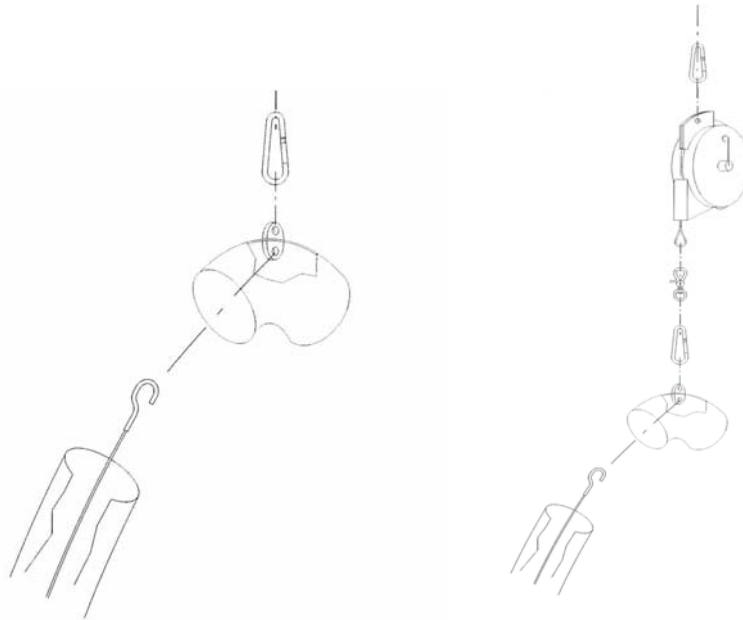
The MagneGrip Horizontal Flex Track system uses a three part flexible hose assembly to make the connection to the apparatus. The upper two sections are a 2-ply hose for flexibility and the lower 2' sections is a 5-ply hose to provide added strength and durability as well as rigidity to aid in attaching the nozzle.

The hose is secured to the elbow riser plate on the track and is supported by the balancer cable using a lifting elbow. On the interior of the hose a cable is installed between the lifting elbow and the nozzle. The cable eliminates stress on the hose by transferring the tension at the release point of the nozzle to the balancer.

Assemble the complete hose drop as follows:

1. Cut 72" from the 5" x 21ft hose. The 72" section will attach between the lifting elbow and the nozzle. The remaining length will be used for attachment between the lifting elbow and riser plate.
2. The lifting elbow consists of a 90 degree elbow, 1-snap hook, 2- hose clamps and 2- rubber sleeves. *The rubber sleeves should be slid over each end of the elbow before attaching hoses.*

Prior to attaching the hoses to the lifting elbow connect the hook of the interior hose cable to the retaining ring inside the elbow. Then feed the cable through the nozzle side of the hose and connect both sections of the hose to the elbow. After the hoses are secured to the elbow with the hose clamps, install 2 – tek screws behind the clamps to prevent slippage then slide the rubber sleeves over the hose clamps.



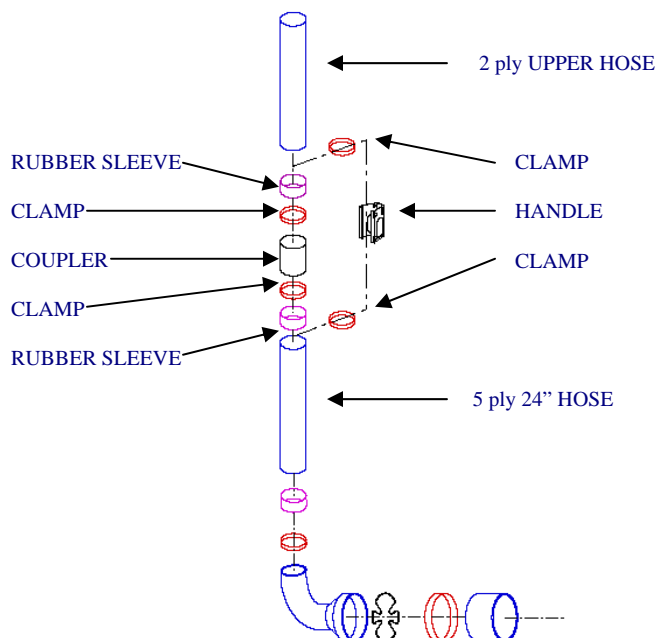
3. Secure the upper section of hose to the riser plate and secure with a hose clamp. Then attach the snap hook of the lifting elbow to the balancer cable. Use a wrench to increase the tension of the balancer spring to raise the cable stop to the housing. (see balancer adjustments)

Cut hose 56" from floor



4. With the balancer cable fully retracted measure 56" from the floor up on the lower section of hose and cut. **Note:** After cutting the hose use pliers to bend over the end of the wire helix to prevent injury.
5. Assemble the upper hose and the lower 24" 5-ply hose as shown below.

Note: Install 2 – tek screws behind the clamps to prevent slippage then slide the rubber sleeves over the hose clamps.

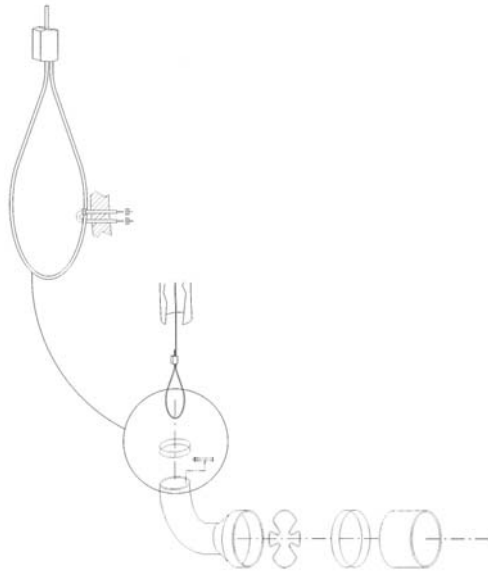


IMPORTANT: The top clamp of the handle should be secured to the center of the hose coupler and the lower clamp secured to the hose. The handle should be secured so it faces away from the vehicle.

6. Make a mark on the cable at 34" off the floor then slide the gripper fastener on to the cable so that it is just above your mark. Then feed the loose end of the cable through the u-bolt on the end of the nozzle and back through the other side of the gripper fastener and pull tight. Cut off the excess cable. Secure the nozzle to the hose with a hose clamp and cover the clamp with the rubber sleeve.

IMPORTANT: For the SFT system the nozzle should be set to face the rear of the bay when the hose is pull the rear of the track to allow for easy attachment to the tailpipe adaptor.

Tip: Be sure to slide the rubber clamp sleeve over the nozzle prior to attaching the cable.

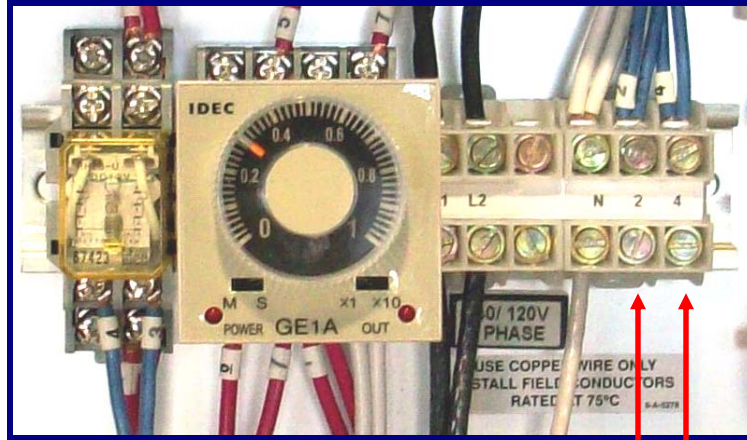


7. Adjust balancer tension as needed to raise the cable stop to the housing.

8:1 STANDARD PRESSURE SENSORS

Pressure sensors are used to actuate the system using the vehicles exhaust pressure. The sensors are installed in the ductwork approximately 6 inches above the riser plate which connects the flex hose to the rigid duct.

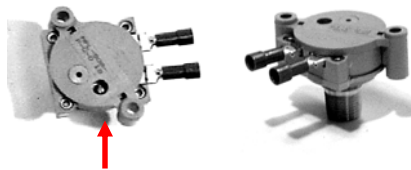
The sensors are hard wire to the control panel using an 18/2 solid strand thermo wire (local codes may require shielded wire). The wire may be secured to the top of the ductwork with cable clips.



SENSOR WIRES CONNECT
TO TERMINALS #2 & #4

ADJUSTMENTS:

Set the sensor using the adjustment screw accessed through a hole in the sensors contact cover. Turning the screw clockwise will increase the sensitivity and turning it counterclockwise will decrease the sensitivity.



ADJUSTMENT SCREW

To set the sensor at the sensitivity level needed, connect the nozzle to the tailpipe of the apparatus and start the engine. If the system does not start leave the engine running and turn the screw clockwise approximately a 1/8th of a turn. Repeat until the system starts. Shut off engine and allow for the system to time-out and then restart engine. If the system does not start repeat this process.

Note: If the system cycles or runs continuously decrease the sensitivity of the sensors as needed

WARNING: If it becomes necessary to move or replace a sensor turn off the power to the control panel. Personal injury and/or damage to the panel may result if the sensor wires are allowed to touch ground. If the leads make contact when removed from the sensor, a signal will be sent to the receiver to start the motor/blower on systems with direct wired sensors.

9:1 OPTIONAL R/F CONTROLLED PRESSURE SENSOR ADJUSTMENT:

A radio frequency controlled pressure sensor can be used to actuate the system using the apparatus engine exhaust pressure when started. The control panel utilizes an integrated R/F receiver to receive a signal from the transmitter. The transmitter is mounted on the riser plate and is connected to a pressure sensor. The sensor is installed in the ductwork approximately 6 inches above the riser plate.

Using a 3/8" drill bit, drill a hole in the ductwork as shown in Fig. 1. The sensor has brass threads that will self-tap into the duct.

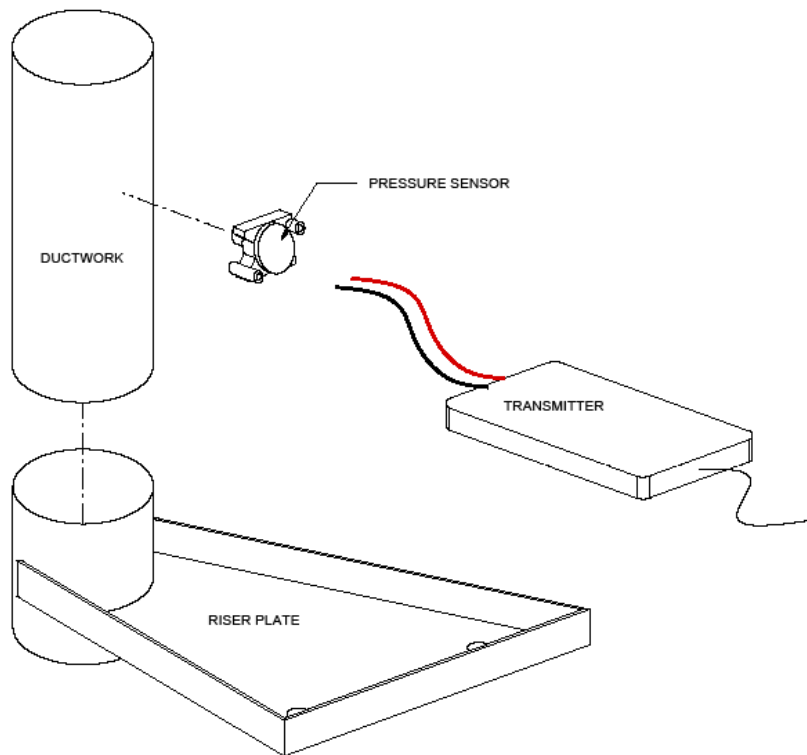


Figure 1

Note: It is recommended that the transmitter battery (9v) be checked and/or replaced every 12 months.

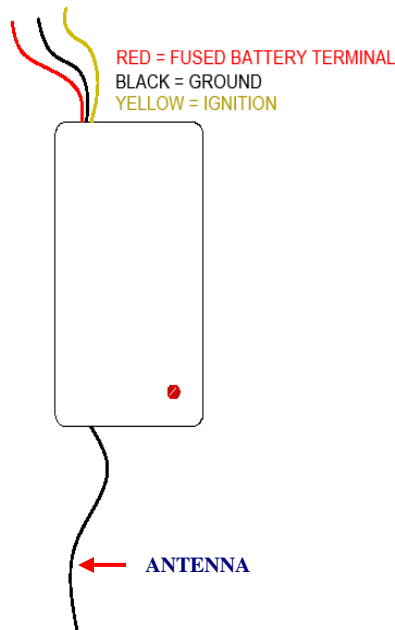
10:1 OPTIONAL AUTO-START TRANSMITTER

The auto-start transmitter can be used to actuate the system with the apparatus ignition. The transmitter is mounted on-board the apparatus and must be installed so that it is continuously powered by the vehicles battery.

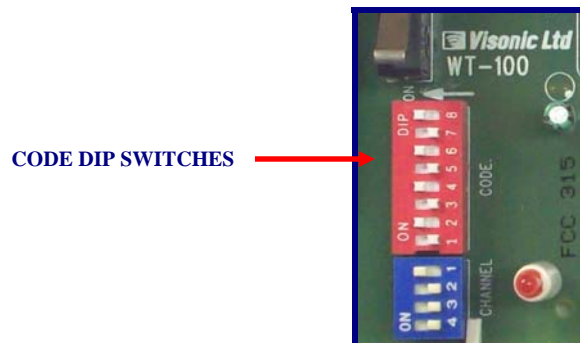
Upon starting the vehicle a signal is sent to actuate the exhaust system. The system will run for the duration of the timer setting in the control panel.

While the ignition is engaged the transmitter will repeat a signal approximately every sixty seconds. Upon return to the station this repeated signal is used to actuate the system prior to the vehicle entering the bay.

540553-01 IGNITION AUTO-START TRANSMITTER ASSEMBLY



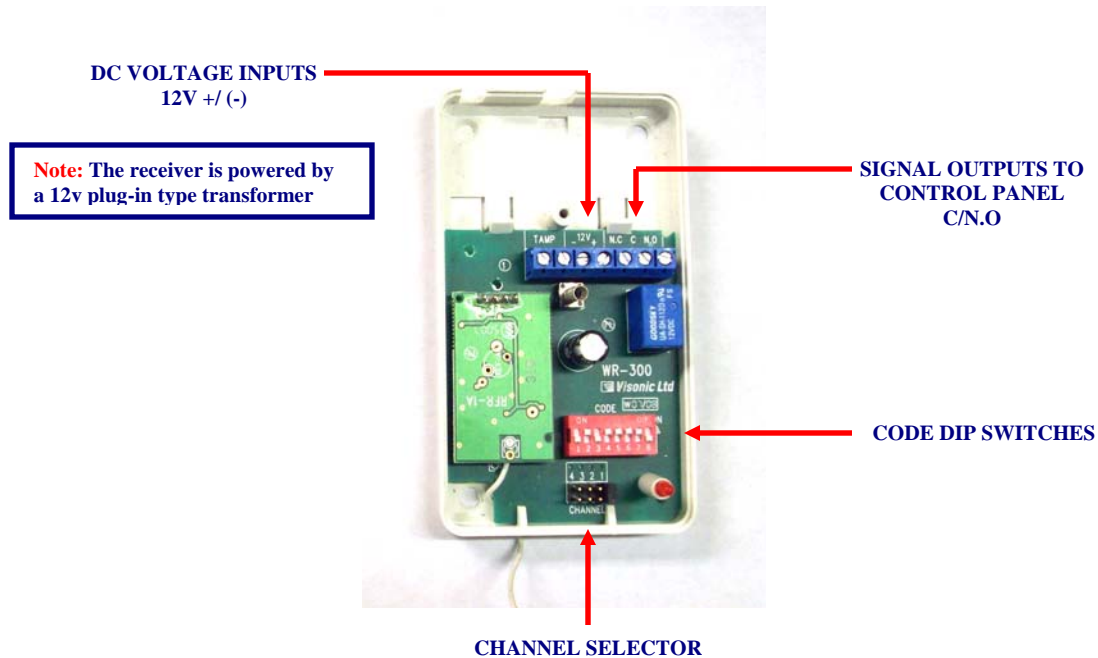
NOTE: Program the dip switch code to match the receiver code in the control panel. (See programming receivers and transmitters)



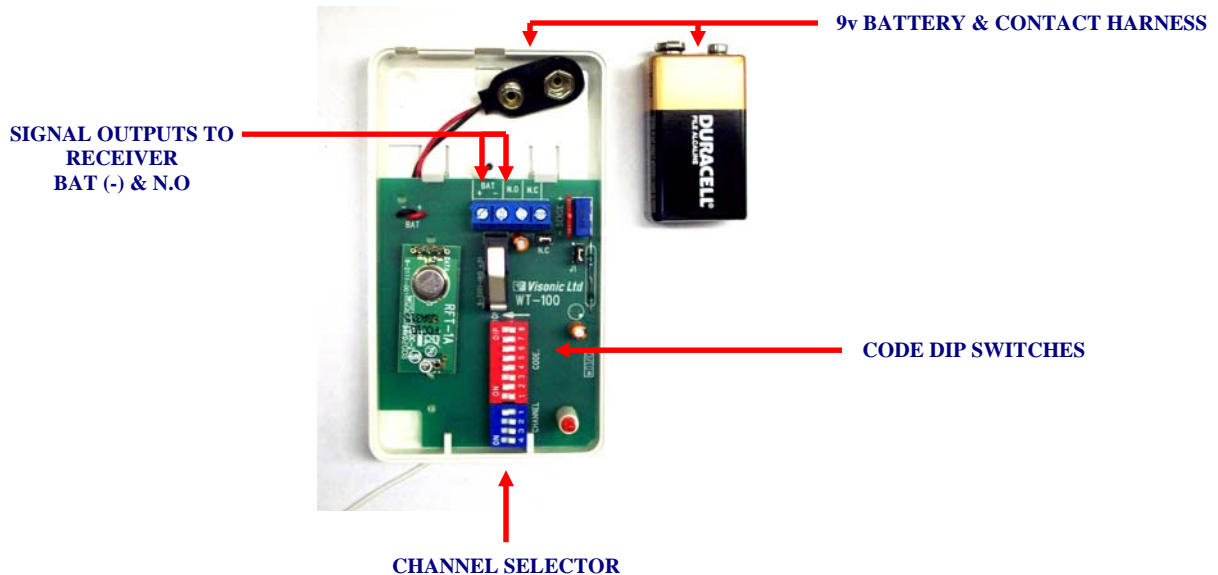
11:1 PROGRAMMING THE RECEIVER AND TRANSMITTERS

Each transmitter must be programmed to the same code as the receiver. This done by setting the dip switches inside of the transmitter, the switches must be set to match the code of the receiver. Also be sure that the transmitter is set to the same channel as the receiver.

WR 300 RECEIVER



WT 100 TRANSMITTER



IMPORTANT: The covers for the receiver and all transmitters must be securely attached for proper operation of the wireless system.

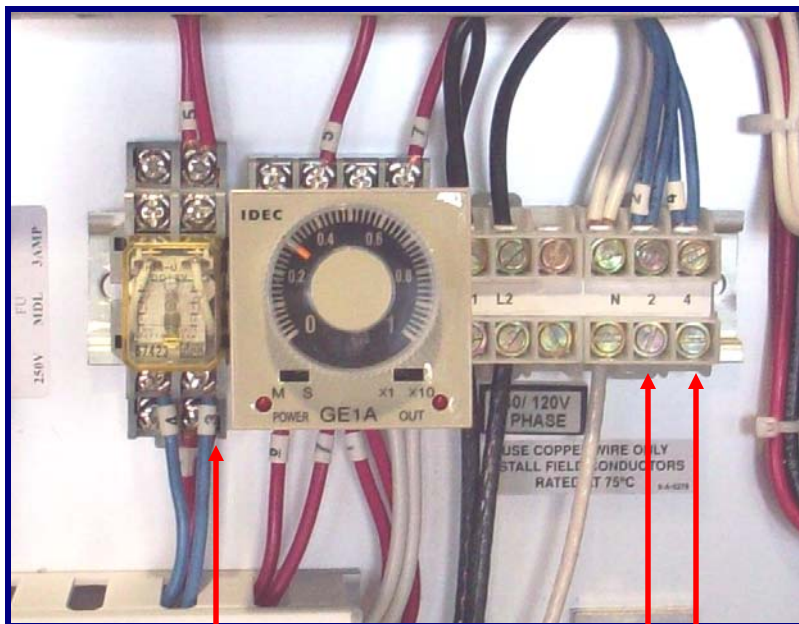
Note: It is recommended that the transmitter battery (9v) be checked and/or replaced every 12 months.

12:1 OPTIONAL PHOTO EYES

Photo eyes mounted at the bay doors can be used as an option to actuate the system as the vehicle passes through the threshold.

In most cases the eyes are used in conjunction with pressure sensors installed in the rigid ducting of a hose drop system. The combination allows the sensor to be set for the start up pressure of the vehicles exhaust only (high pressure) thereby eliminating the need to set the sensors for idle speed pressure (low pressure) which can result in cycling of the fan. The photo eyes will also serve as a back-up to start the system as the vehicle exits if a sensor fails to respond.

It is recommended that the photo eyes be installed at approximately 80" off the floor to allow pedestrian traffic to pass under the eyes beam. At this height the most vehicles engage the beam. The use of flags mounted to the doors may also be used to break the beam for immediate actuation of the system when the doors are opened.



BLUE (-)
CONNECTS TO THE #3
WIRE UNDER 12v RELAY

BROWN (+)
TERMINAL #2

BLACK (SIGNAL)
TERMINAL #4

The brown and blue wires from the emitter may be coupled with the brown and blue at the receiver. Then from the receiver the brown, blue and black will connect to the control panel as indicated above.

Note: The white and grey wires on the receiver eye are not used. Cap each wire separately.

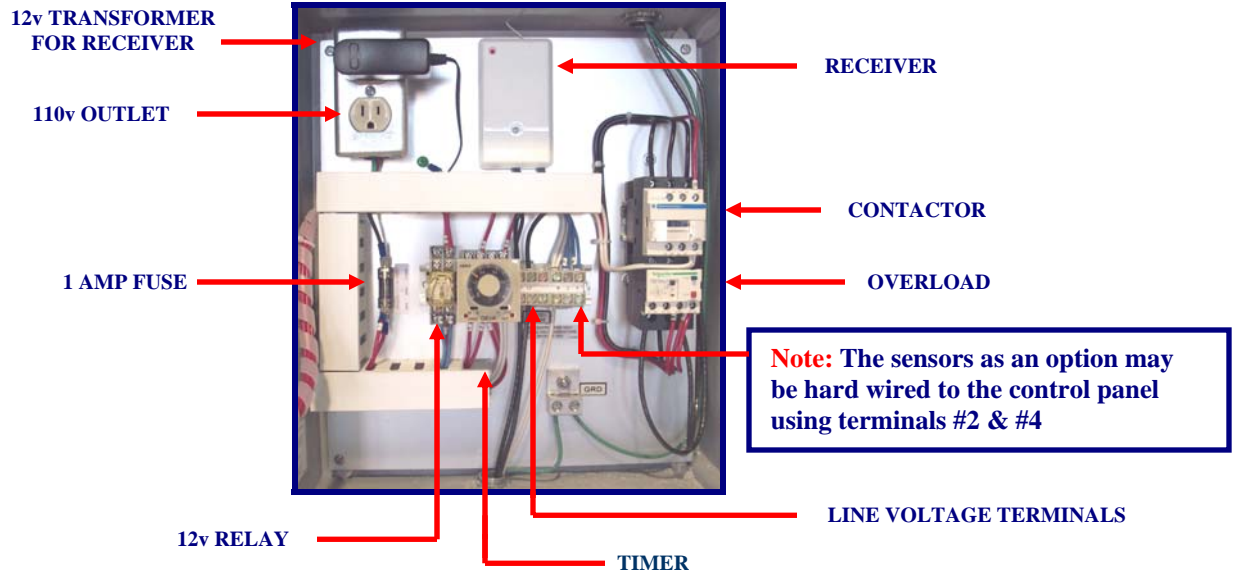


13:1 WIRELESS CONTROL PANEL

The wireless control panel is used as means to operate the system; it is the actual starter. When the pressure sensor actuates the transmitter a signal is sent to the receiver in the control panel to start the fan motor.

An adjustable timer incorporated into the panel allows the fan to run for 1 to 10 minutes before timing out. The average setting used by most departments is 3 minutes.

The control panel should be located with consideration to the electrical service panel, the fan location, and accessibility. The ability to gain easy access to the manual start switch is needed so that personnel can run the system in the manual mode when vehicle checks are performed in the bay area.



The panel is provided with a switch to by pass the timer to run the fan in manual mode. When switched to the manual position the system will operate continuously. When the switch is returned to the auto position it will turn off the fan. A timer reset button is provided to allow the system to be turned off manually when operating in the timer mode. This convenience button is used to eliminate the need to adjust the timer or shut off the power to reset the timer when adjusting the sensors.

IMPORTANT: If the system is used to perform engine checks the panel switch must be turn to manual to over ride the timer. When check is completed turn the switch back to auto.



WARNING: If it becomes necessary to move or replace a sensor turn off the power to the control panel to avoid unintentional fan start-ups.

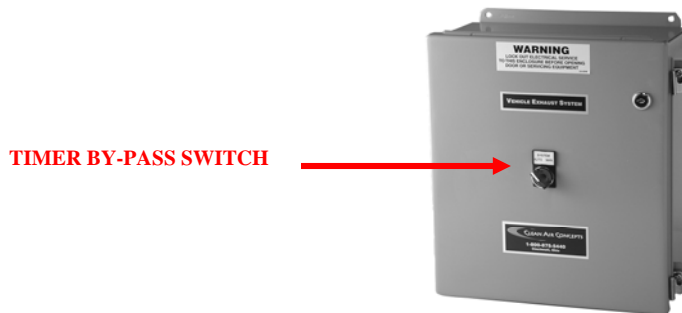
14:1 STANDARD CONTROL PANEL LOCATION

The control panel is used as means to operate the system; it is the actual starter. When the pressure sensor is actuated it sends a signal to the control panel to start the motor/blower. A timer is incorporated into the panel that allows the blower to run for 3 minutes before timing out.

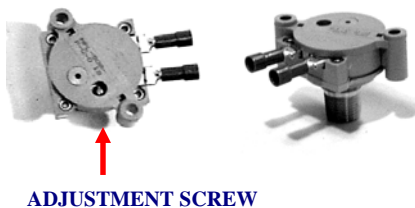
The panel is provided with a switch to by-pass the timer to run the fan in manual mode. When switched to the manual position the system will operate continuously. After the switch is turned back to the auto position it will reset the timer and the fan will time out after 3 minutes.

The control panel should be located with consideration to the electrical connection, the fan location, and accessibility. The ability to gain easy access to the manual start switch is needed so that personnel can turn the system on manually when vehicle checks are performed in the bay area.

The 18/2 thermal-wire that is used to connect to the sensor(s) is attached to terminals #3 and #4 in the control panel.



Sensor adjustment: Adjust the sensor using the adjustment screw accessed through a hole in the sensors contact cover. Turning the screw clockwise will increase the sensitivity and turning it counterclockwise will decrease the sensitivity.



To set the sensor at the sensitivity level needed, connect the nozzle to the tailpipe of the apparatus and start the engine. If the system does not start, leave the engine running and turn the screw clockwise approximately a 1/8th of a turn. Repeat until the system starts. Shut off engine, allow for the system to time-out and then restart engine. If the system does not start, repeat this process.

WARNING: If it becomes necessary to move or replace a sensor turn off the power to the control panel! Damage to the panel WILL result if the sensor wires are allowed to touch ground!

15:1 FAN MAINTENANCE

Depending on the age, size and brand of the motor that is installed on the blower assembly lubrication of the bearings may be necessary. Some motors are equipped with permanently lubricated bearings which do not require servicing.

The motor should be serviced every six months.

Be careful not to over lubricate doing so will force grease on to the windings and could cause pre-mature failure due to overheating.



CORRECT
Motor base set horizontal

The motor/blower assembly can be installed in various configurations. Some fan styles may require alterations to the factory set discharge direction.

It is extremely important that when rotating the discharge from the factory set position the motor be turned to position its base horizontally.



INCORRECT
Motor base set vertical. Base should always be set horizontal

The motor has weep holes to allow condensation to drain. Premature failure can happen due to moisture build-up if installed in any other position.



VERY IMPORTANT:
Drill 1/8" hole in the bottom of the fan housing to prevent moisture accumulation.

The motor/blower should be inspected to be sure that all mounting material and hardware are in good repair and tight. The inlet and discharge should be inspected to ensure that there are no obstructions to prevent proper air movement. The housing should also be checked for moisture build-up from rain and snow. A 1/4" hole should be drilled in the bottom the housing to allow moisture to drain.



A non fused safety disconnect is required for all motors according to local electrical codes.

IMPORTANT: Turn power off at disconnect before servicing.

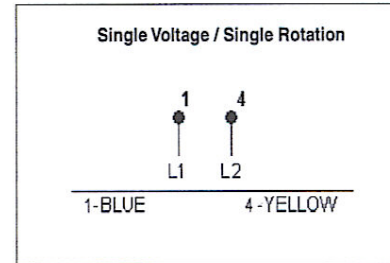
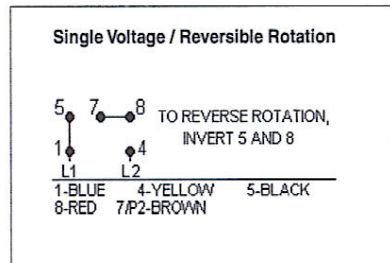
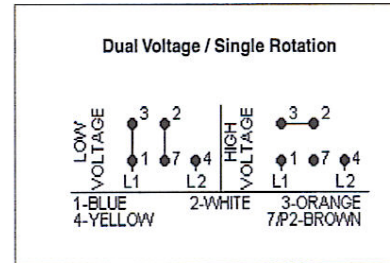
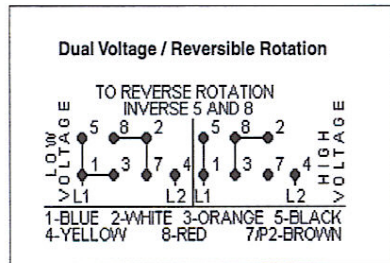
16:1 TYPICAL SINGLE PHASE MOTOR WIRING

Typical Wiring Diagrams

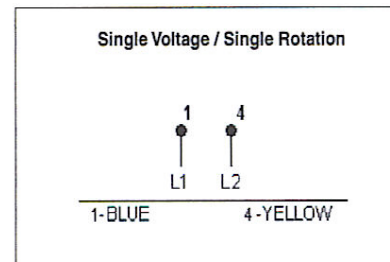
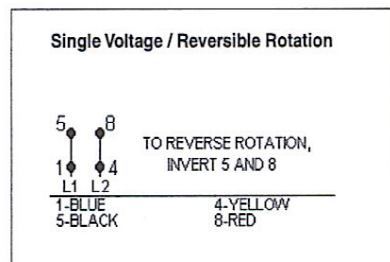
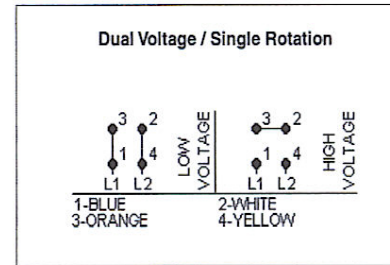
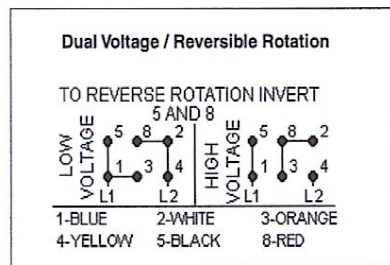
Always use wiring diagram supplied on motor nameplate

Single-Phase Motors

With Thermal Overload Protection



Without Thermal Overload Protection



17:1 TYPICAL THREE PHASE MOTOR WIRING

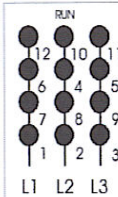
Typical Wiring Diagrams

Always use wiring diagram supplied on motor nameplate

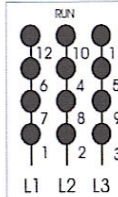
CONNECTION DIAGRAMS

WEG Three Phase Motors
460 Volts / 12 Lead / Part Winding
(#Co4-460-12 Leads Part Winding)

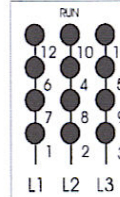
Starting Type
(460 Volts)
Across Line



Starting Type
(460 Volts)
Soft Start

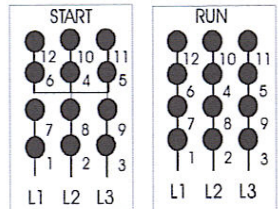


Starting Type
(460 Volts)
RVAT*

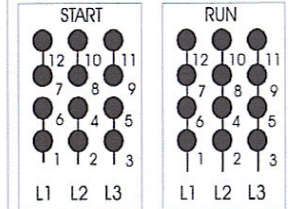


* Reduced Voltage Auto Transformer

WYE-DELTA
(460 Volts)



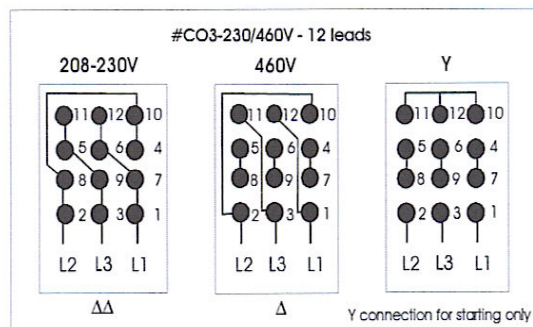
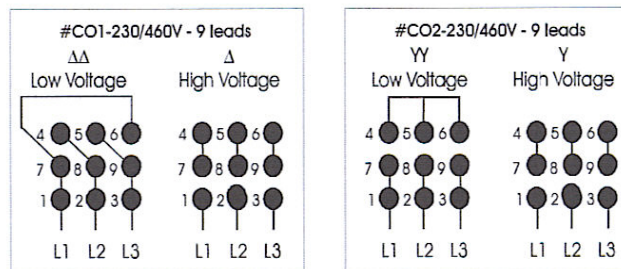
PART-WINDING
(460 Volts)



NOTE: Always check motor name plate for the correct wiring diagram for that motor.

CONNECTION DIAGRAMS

WEG Three Phase Motors



Wiring Diagrams



18:1 SYSTEM OPERATION PROCEDURE:

1. Prior to motioning the apparatus into the bay, pull the cable of the balancer down and lock it at the yellow locating tab.
2. Motion the vehicle into the bay and stop the tailpipe at the desired location for connection.
3. Attach the nozzle to the tailpipe adaptor by aligning the top notch of the nozzle boot with the top locating pin of the adaptor. Push down and in to secure the nozzle.
4. After attaching the nozzle, motion the apparatus into the bay.
Upon exiting the bay the trolley will travel toward the bay door and will be stopped by the end stop at the front of the track. The nozzle will then detach from the tailpipe adaptor and the balancer cable will retract the hose.



IMPORTANT: For proper operation the balancer cable must remain in the locked position.