



## WEIAND BBC “TRACK WARRIOR” INTAKE MANIFOLD

P/N 7620 - Oval Port, 4150 Square Bore Carb

P/N 7621 - Oval Port, 4500 Dominator™ Carb

P/N 7622 - Rectangle Port, 4150 Square Bore Carb

P/N 7623 - Rectangle Port, 4500 Dominator™ Carb

INTAKE MANIFOLD  
INSTALLATION INSTRUCTIONS – 199R10374

### APPLICATIONS:

**WEIAND TRACK WARRIOR** intake manifolds 7620-7623 are designed for Mark IV-VI, 396-502 cid Big Block Chevrolet engines equipped with standard Oval (7620 & 7621) or Rectangle (7622 & 7623) port cylinder heads with standard deck height applications for both 4150 square bore and 4500 Dominator™ carburetor configurations. These manifolds will also work with any BBC equipped with aftermarket cylinder heads, as long as they have standard Oval or Rectangle port flange openings and bolt hole locations.

These single-plane intake manifolds are designed for high-performance engine applications up to 540 cubic inch displacement and maximum engine speeds of 7000-8000 rpm, depending on the engine combinations. **TRACK WARRIOR** intake manifolds are intended for maximum performance applications and may not accept stock components and hardware. They may not fit under an unmodified hood for many vehicle applications.

### EMISSIONS EQUIPMENT:

**TRACK WARRIOR** intake manifolds do not accept any emission-control devices, hot-air, or divorced chokes. This part is not legal for sale or use for motor vehicles with pollution-controlled equipment.

### DIMENSIONS:

- A-B Height – A – 5.96” (front), B - 5.96” (rear). **NOTE:** Measured from front and rear manifold end seal surfaces.
- Oval Port Size – 1.87” High x 1.60” Wide
- Rectangular Port Size – 2.28” High x 1.48” Wide

### BEFORE YOU BEGIN INSTALLATION:

The following installation instructions must be carefully read and understood before you begin installation. Below is a preliminary check list that should be completed before you begin installation. Improper application or installation of this product may result in unsatisfactory performance. Failure to follow these installation instructions could result in engine damage and may void your warranty. If you require any assistance regarding this product please contact Holley Technical Support at: 270-781-9741, Fax: 270-781-9772, or for online assistance refer to the Tech Service section of our website at [www.holley.com](http://www.holley.com).

**IMPORTANT:** Although all WEIAND parts pass several inspections, it is imperative that the installer personally inspects the part before installation. Run a stiff wire through passages while shining a bright light into it. Also, wash the part using a mild soap and water solution. Check the fit on all bolt holes for proper alignment and thread any fittings in first by hand. Failure to perform these simple checks could result in engine damage and may void your warranty.

### PRELIMINARY CHECKLIST:

- Carefully read and understand these installation instructions.
- Check that this intake manifold is the correct choice for your engine application (intake port configuration & carburetor type), desired performance level, and local emissions laws.
- Inspect the manifold for any damage that may have occurred during shipping. If damaged, contact your dealer immediately.
- Check that all of the parts listed in the Kit Contents list in these instructions have been included with your intake manifold.
- Inspect all threaded holes.

- Inspect all internal passages with a light and a stiff wire to be sure that the passages are not obstructed and have been properly cleaned to be free of any debris.
- Check for sufficient hood clearance with this intake manifold and intended carburetor/air cleaner combination to be used.
- Check that you have all of the parts required for the installation. These include the intake manifold gasket set, gasket adhesive, RTV silicone sealant, and pipe thread sealant as shown in the Parts Required list in these installation instructions.
- Check that you have all the tools you will need to perform the intake manifold installation. A recommended but not exhaustive list is located in these installation instructions.
- Check that you have the proper intake manifold fasteners for this application.
- If using your old carburetor, before you remove it from the engine make sure it is working properly and that the carburetor is tuned properly. Consult the shop manual or installation instructions for that carburetor to determine if the carburetor is in proper tune.
- If you are using a new carburetor, make sure you have read and understand the installation instructions for that carburetor and that the initial adjustments are within the manufacturer's specifications.
- Pre-fit your carburetor on the intake manifold, making sure that the throttle linkage and butterflies can freely cycle between WOT and fully closed. If using a carburetor with vacuum actuated secondary butterflies, make sure the secondary linkage can move freely.
- Before removing your old intake manifold, make sure that your ignition system is in good working order; check and note the current ignition timing. Make sure that the timing marker is legible and understandable. With the engine at top dead center on the #1 cylinder, note and mark the orientation of the distributor body to the engine and the orientation of the rotor to the distributor body. This will aid in the re-installation of the distributor. Consult these installation instructions and your vehicles shop manual for specific instructions.
- Before removing your old intake manifold check the adjustment of your automatic transmission kick-down linkage (auto trans only) to make sure it is adjusted properly. Consult your shop manual and make sure that you understand the kick-down linkage adjustment and how to properly adjust it when you install your new intake manifold.
- Before removing your old intake manifold check all of your fuel, water, and vacuum hoses and their connections. Make sure that there are no leaks and that the hoses are in good condition. Mark the locations of your hoses making sure that there is a corresponding location on your new intake manifold for all of the hose fittings and gauge sensors. Fitting and hoses that are not in good condition should be replaced.

**NOTE:** This intake manifold is not equipped with a vacuum fitting port. If you need vacuum for any accessories and an appropriate vacuum port is not provided by the carburetor, a hole must be drilled and tapped for your desired vacuum fitting in the back of the plenum below the carburetor flange.

## KIT CONTENTS:

- 1 – **TRACK WARRIOR** Intake Manifold
- 3 – 1/2 NPT Hex Pipe Plugs
- 1 – Installation Instructions
- 1 – Warranty Card

## PARTS REQUIRED:

**NOTE:** It will be necessary to purchase some of the parts listed below (or their equivalents) in order to properly complete the manifold installation. Determination of equivalency is the responsibility of the consumer. WEIAND does not assume that responsibility.

- Intake manifold gasket set (7620/7621 - Fel-Pro® P/N 1212 or 7622/7623 - Fel-Pro® P/N 1275) is recommended
- Valve cover gasket set
- Thermostat housing gasket (Fel-Pro® P/N 2201,2202)
- Oil-resistant, silicone-based sealant (Permatex® silicone form-a-gasket., Dow Corning® Silastic®, or equivalent)
- Spray gasket adhesive (Permatex® 80064 High Tack™ Spray-A-Gasket™ sealant or equivalent)
- Carburetor-base gasket (usually supplied with carburetor)
- Thread sealer (Loctite® 565, Permatex® 56521, or equivalent)

**NOTE:** Never install tapered (pipe) fittings in an aluminum manifold dry without thread sealer or thread damage will occur.

## TOOLS REQUIRED:

- |                                                           |                                                      |
|-----------------------------------------------------------|------------------------------------------------------|
| Socket wrench set 3/8"-drive ratchet and extensions       | Open end wrenches 3/8" to 1"                         |
| Box end/flare wrenches (optional)                         | 10" adjustable wrench (crescent)                     |
| Ignition wrench set                                       | Screwdrivers, standard and Phillips, various lengths |
| Gasket scraper                                            | Needle nose pliers                                   |
| Drain bucket                                              | Timing light                                         |
| Torque wrench                                             | File                                                 |
| 3/8-16 NC thread chaser, or tap (for cleaning bolt holes) | Vacuum Gauge                                         |

## OTHER USEFUL SUPPLIES:

Engine coolant	Engine oil
Shop towels, paper and/or cloth	Masking tape
Pad and pencil	Modeling Clay

## INSTALLATION INSTRUCTIONS:

These instructions are designed to cover a wide variety of vehicle applications. If your vehicle is not equipped with any items referred to in these instructions, such as transmission kick-down linkage, air conditioning, or power brakes, proceed to the next step. Also, if you are unfamiliar with any of the procedures in these instructions consult a shop manual for your vehicle and engine application.

## CHECK FOR ADEQUATE HOOD HEIGHT:

1. We recommend making several columns of modeling clay and placing them on your air cleaner in various positions.
2. Close the hood completely and then reopen it.
3. Measure the clay columns and record your hood clearance.
4. Compare the A-B height of your old intake manifold with your new intake manifold. Also consider that the carburetor/air cleaner combination determines the difference in the air cleaner to hood clearance.

## MANIFOLD REMOVAL PROCEDURE:

1. Disconnect the ground cable from the battery.
2. Clean any loose debris, dirt, and grease from the top of the engine adjacent to the intake manifold and valve covers. This will help prevent harmful debris from falling into the engine during the installation process.
3. Identify the vacuum and crankcase ventilation hoses (if any) leading to air cleaner and note the routing and connection points. Remove the air cleaner.
4. Prior to removing any other vacuum lines, identify the routing of the lines. Mark and remove the vacuum lines from the carburetor and/or intake manifold.

### **WARNING: Hot water and steam may be present if the engine is still warm.**

5. Drain the radiator. (It may be necessary to remove the bottom radiator hose if there is no drain plug in the radiator).
6. Disconnect the throttle linkage, transmission kick-down linkage (auto trans. only), and choke rod from the carburetor, (if applicable).
7. Loosen the gas cap to relieve pressure from the fuel system. Disconnect the fuel line at the carburetor. Plug the end of the fuel line to prevent fuel leakage.
8. Remove the carburetor.
9. Tag and disconnect the ignition coil and sensor wires. Remove the ignition coil bracket and the coil.
10. Remove the radiator hose, thermostat housing, and the thermostat.
11. Remove all water and vacuum fittings from the manifold.
12. Remove all remaining brackets (if any) from the manifold.
13. Loosen and remove the valve covers to assist in the manifold removal and the new manifold installation.

## 14. DISTRIBUTOR REMOVAL PROCEDURE:

### **CAUTION! FOLLOW THESE INSTRUCTIONS CAREFULLY, AS SERIOUS DAMAGE CAN OCCUR WHEN THE IGNITION IS NOT RE-INSTALLED CORRECTLY.**

- Set the engine on Top Dead Center (after compression stroke) for #1 cylinder using the crankshaft timing marker.
- Remove the distributor cap.
- Note the position of the rotor and make a mark on the distributor body in line with the rotor tip (it should point to the position of the cylinder #1 spark plug wire on the distributor cap).

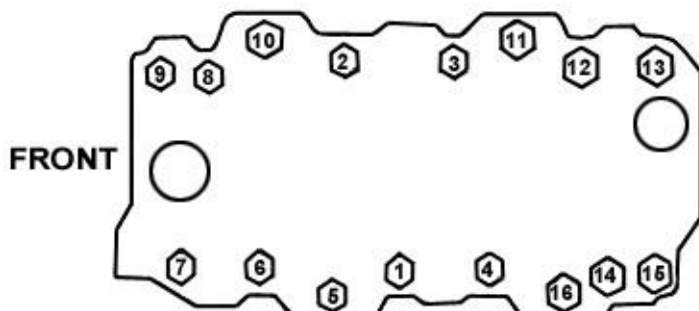
- Note the orientation of the distributor (using a distinct distributor body feature) and place some type of reference mark on a convenient surface not attached to the intake manifold.
- Note the position of the points, if open, how much; if closed, note the distance from the point block to the cam lobe. If the distributor has a magnetic pickup, note the position of the trigger wheel with respect to the pick-up.
- Remove the distributor. DO NOT rotate the engine after removing the distributor (but if you do, the crankshaft timing marker is your reference).

15. Remove the intake manifold-to-cylinder head bolts.

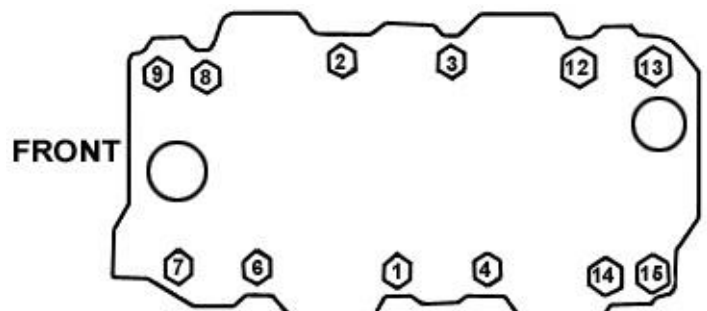
16. Remove the intake manifold. If the intake manifold is stuck hard to the mounting flanges, do not pry against cylinder head port flanges, as they could become damaged and compromise the gasket sealing with your new intake manifold. Double check that all of the bolts have been removed and pry upward carefully at the engine block end seal surfaces.

## INSTALLING YOUR INTAKE MANIFOLD:

1. Clean the cylinder head port flange and the engine block end seal surfaces. To prevent gasket pieces from falling into ports and the lifter valley when cleaning old gaskets from head surfaces, stuff paper towels into all the ports and lay rags in the lifter valley. When clean, carefully remove the paper towels from the cylinder head ports and then the rags from the lifter valley. Make sure that all particles that fell on the rags are completely removed. Wipe surfaces with rags soaked in solvent, such as brake cleaner or lacquer thinner to remove any oils or grease. This is a must for proper manifold/gasket sealing.
2. Apply a thin coat of gasket adhesive to the cylinder head side of the intake gasket surfaces and the cylinder head port flanges. Allow the adhesive to completely dry. Lay the manifold gaskets in place, making sure that gaskets are adhered to the cylinder head port flange and will not slip from their properly installed positions.
3. Trial fit your new intake manifold before applying any RTV silicone sealant. Place the new intake manifold into position; check that it sits down, properly seated on the intake manifold gaskets. There should be gap between the engine block and the manifold at the end seal surfaces. Check to make sure all of the intake manifold bolts can be installed. If there are any other fit issues such as hood clearance or installation of components dependent on the manifold, they should be checked at this time.
4. When you are fully prepared to install the intake manifold, apply a 1/4" wide bead of oil-resistant RTV-silicone sealant to the front and rear block-sealing surfaces, making sure to overlap manifold gaskets at all four corners. **Do not use the cork or rubber end seal gaskets included in the gasket set.** Apply a light film of RTV-silicone around the water passage openings.
5. Carefully, lay your intake manifold in place. If the manifold must be moved, the RTV-silicone may need to be cleaned and re-applied. For the bolts to be installed in bolt holes that are drilled through, apply a dab of thread sealer on the threads. For the blind bolt holes, apply a drop of motor oil to the bolt threads. Install the intake bolts initially torquing to 10 ft./lbs., then 15 ft./lbs., following the factory GM sequence (see below), and finally torque to 25 ft./lbs.



7620 & 7621 Torque Sequence



7622 & 7623 Torque Sequence

**NOTE: Omit bolts # 5, 10, 11, & 16 in the sequence for P/Ns 7622 or 7623 (rectangle port applications).**

6. Install the thermostat, gasket, and thermostat housing. Be sure that the thermostat housing is in good condition and has been cleaned of any old gasket material. If the mounting flange on the thermostat housing is not flat or is damaged, replace it before continuing.
7. Install the heater hose fitting, coolant bypass hose fitting, bypass hose, heater hose, and radiator hoses. Use thread sealer on the threads of the heater hose fitting.
8. Install the gauge sensors and vacuum fittings into the manifold. Use thread sealer on the pipe threads of the sensors and fittings. Install pipe plugs in any unused water and vacuum ports in the manifold (plugs have been provided in the kit).
9. Install the distributor and gasket orienting the rotor and the distributor body according to the reference marks made before the distributor was removed (Distributor Removal Section). Make sure that your distributor engages the oil pump drive shaft and seats

properly down against the gasket and manifold. Install the distributor clamp and tighten the bolt just enough that the distributor body can still be rotated by hand.

10. Install your four carburetor studs in the manifold. Place the carburetor gasket on the clean carburetor pad. Do not use any type of sealant on the carburetor gasket.
11. Install the carburetor. Connect all linkage and throttle springs.
12. Connect all vacuum and fuel lines. Refer to your tags or drawings for correct placement.
13. **Automatic transmissions only:** Adjust kick-down or throttle pressure linkage for proper shift points (refer to your vehicle's shop manual for the proper adjustment procedure). Check all linkages, making sure that they function freely.
14. Reinstall valve covers and new gaskets.
15. Close the drain and fill the radiator to the proper level with coolant. While filling, allow trapped air to bleed from the intake manifold at the heater hose fitting until coolant flows from the fitting. Then, re-install the heater hose and continue adding coolant to the proper level.
16. **IMPORTANT!** Change the oil to remove any coolant or debris that may have contaminated the crank case.
17. Retighten the gas cap and connect the battery cable.
18. Hook up the timing light and start the engine. Set the timing to proper specs. Tighten the distributor.
19. Check for possible fuel, oil, or coolant leaks and for proper carburetor linkage operation.
20. Install the air cleaner.

**CAUTION! With the air cleaner installed, check to be sure that there is adequate clearance for the throttle and choke linkages through their full range of travel.**

**IMPORTANT: Check for adequate hood clearance before closing the hood.**

21. Operate the engine for 30 minutes. Allow the engine to cool and re-torque the manifold bolts following step 5 above.
22. **YOUR MANIFOLD INSTALLATION IS COMPLETE.**

## PERFORMANCE RECOMMEDATIONS:

**TRACK WARRIOR** intake manifolds are designed for high-performance engine applications. Many engine combinations respond favorably to some simple modifications and changes in tuning. Below are several recommendations that may increase the performance potential of your engine equipped with a **TRACK WARRIOR** intake manifold.

### 1. PORT MATCHING:

**TRACK WARRIOR** intake manifolds (P/N 7620, 7621, 7622, & 7623) are designed with material at the port flange exits to allow for custom port matching to your cylinder head intake port entries. When port matching, typically the intake manifold port flange openings are sized and aligned to be .030-.050" per side inside the cylinder head intake port entries. This allows for variations when positioning the manifold on the engine. The goal is to align the intake manifold runner exit within the cylinder head intake port entry. If you are not familiar with how to port match an intake manifold, consult a cylinder head porting specialist.

### 2. TUNING WITH CARBURETOR SPACERS:

If hood to air cleaner clearance is not an issue, carburetor spacers can often be an effective way to increase performance with your engine combination. Spacers affect performance by changing plenum volume and the distance from the carburetor to the plenum floor (affecting engine airflow) or by changing the signal to the carburetor (affecting air-fuel ratio and distribution). Insulating spacers (phenolic) are also used to reduce heat transfer from the intake manifold to the carburetor. This reduces the temperature of the fuel in the carburetor, preventing fuel from boiling and vapor lock. The following table is a general guide to the effects that different carburetor spacer designs can have on engine performance. Remember, often making one change will also require other tuning changes to optimize the new combination. Then changing to a different intake manifold/carb spacer configuration, changes to your carburetor jetting may be required to get the best performance.

<b>Spacer Type</b>	<b>Performance Effects (Engine Airflow)</b>	<b>Performance Effects (Carburetor Tuning)</b>
Open	Increases high RPM VE (engine air flow) vs. decreasing low RPM throttle response	Reduces signal to carburetor, jet size may need to be increased
Four-Hole	May improve cylinder-to-cylinder air distribution, dampen reversion at some engine speeds	Increases signal to the carburetor, inhibits reversion from reaching the carburetor boosters. May richen air-fuel ratio at certain engine speeds. Increase low and mid-RPM power without hurting high RPM power.
Four-Hole Tapered	For applications with limited carburetor throttle bore sizes – Improves the transition of the flow from high velocity in the carburetor throttle bore to the lower velocity of the open plenum	Similar to straight four-hole, improved transition helps to keep fuel suspended in the charge-air
Combination Four-Hole-Open	Usually a 2" thick spacer, first 1" four-hole, second 1" open. Good for combination requiring the effect of both an open and a four-hole	Similar effects as a 1" four-hole spacer

**Weiand Technical Support**  
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**For online help, please refer to the Tech Service section of our website: [www.holley.com](http://www.holley.com)**

**199R10374**

**Revision Date: 8-13-14**