REQUIRED EQUIPMENT FOR INSTALLATION OF THIS KIT:

Hand Tools

3/8" Metric socket and drive set
Screw driver set
Open end Metric wrench set
½" Metric socket and drive set
Line wrench set (metric / AF)
Hacksaw blade and holder (cut-off wheel opt.)
Electrical Crimping Tool
Tin snips
Hammer

Workshop Equipment

3/8" NPT tap / handle
3/16" drill bit
19/32" drill bit (stepped)
3/8" (min.) electric drill
GM "F" Body car shop manual
Cylinder leak down test equipment
Drivetrain support, height adjustable Spin Jack
2 post lift

Supplies

Permatex Ultra Copper RTV Silicone
Teflon thread sealer paste
NGK Spark Plugs (recommended)

BEFORE YOU BEGIN:

The instructions that follow were written to assist you in making the most effective job of installing the most complete forced induction kit on the market today. Due to the complete nature of this kit, and the large number of standard components included, we strongly recommend that you carefully follow the steps in this manual. The installation can be performed on or off a lift. Off a lift is likely to be very difficult. These instructions were written to cover the easier, on lift installation.

We hope you will enjoy your new twin turbocharged F Body.

1. STOCK COMPONENTS TO BE REMOVED

Disconnect the negative battery terminal, drain engine coolant and then, using the genuine GM workshop manual procedures:

Remove, but do no discard:

1. Airflow meter
2. IAT sensor/grommet
3. EGR control valve
4. Spark plug wires/coil pack assembly
5. Front valance/nose panel of car
6. O2 sensors (all four)
7. Horn/bracket assembly
8. Oil Filter
9. Air Pump/ Silencer

Remove and modify before replacement:

1. Catalytic converter Y pipe assembly
2. Plastic panels (horizontal) valance panel to inner fender liner
3. Plastic panel, forward radiator cooling ducting
4. Crash absorbtion pad
5. Fuel pump mounting module
6. Alternator assembly

Remove and discard:

1. Flexible throttle body duct
2. Air cleaner assembly
3. Air cleaner mounting plastic panel
4. Breather hose – RHS rocker cover to throttle body
5. Spark plugs
6. Exhaust headers
7. Small housing on side of block, immediately above oil filer mounting boss
8. Drain coolant from block (may be re-used) and remove
9. Large allen head plug (28 mm x 1.25) from forward LHS of block
10. Both steel power steering rack hydraulic lines
11. Air pump/silencer mounting brackets
12. Hose, from LHS of throttle body to electronic control valve above LHS fuel rail

2. CLEARANCE MODIFICATIONS AND STOCK COMPONENT RELOCATION/MODIFICATION

A.C. LINE

The aluminum line coming down from the back of the air conditioning compressor must be carefully bent as far towards the block and upwards towards the compressor mounting bracket as possible. This is shown indicatively in the RHS siding drawing of Diagram 6.

PLASTIC PANELS

The black plastic panels must be trimmed as shown in Diagram 2. Retain for fitment later.

CRASH ABSORBTION PAD

The pad must be trimmed on the ends, as shown in Diagram 2, in order to allow access to the openings in the end of the steel crash absorption beam. Retain for fitment later.

CATALYTIC CONVERTER Y PIPE ASSEMBLY

The stock catalytic converters must be installed in the new Y pipe tubes (items 10, 11). If this has not been done by Incon Systems, please contact the factory for details of the procedure. Retain for fitment later.

O2 SENSORS

The two stock forward O2 sensors should be installed in the new exhaust manifolds (items 1, 2) as shown in Diagram 1.

IAT SENSOR/GROMMET

The grommet and then IAT sensor must be installed in LHS side of major air entry duct casting (item 59) as shown in Diagram 7.

AIR PUMP/SILENCER

The air pump/silencer are relocated to the engine compartment, using brackets (items 71, 72) and hardware (items 73, 74, 75, 76) as shown in the LHS insert of Diagram 7. The stock electrical harness will relocate to this position, without modification.

HORN

The horn is relocated higher as shown in Diagram 7 in order to make room for the RHS air cleaner assembly and intercooler.

SPARK PLUGS

New NGK TR6 spark plugs should be installed.

ALLEN HEAD PLUG (28 mm x 1.25) IN SIDE OF BLOCK

The stock plug is replaced by adaptor (item 141) as shown in Diagram 5.

ALTERNATOR

The plastic cover on the rear of the alternator needs to be trimmed for clearance from the LHS silicon air cleaner/ turbo duct as shown in Diagram 5.

POWER STEERING LINES

The stock lines are replaced by new pieces (items 38, 39) as shown in Diagram 5.

AIR CLEANER MOUNTING PANEL

The stock panel is replaced by the new piece (item 69) and mounting hardware (items 54, 55, 66, 78). This has the intentional effect of moving the top of the radiator back towards the engine.

SMALL HOUSING ABOVE OIL FILTER

The stock component is replaced by a new piece (item 110), using stock hardware and new gasket (item 136).

FUEL PUMP MOUNTING MODULE

Depending upon model year (1998 – Diagram 13, 1999 on – Diagram 12), a new fuel pump (item 160) is installed as shown. In addition, the stock regulator is removed and replaced by a plug (item 168) using the stock "O" ring and retaining clip. A new adjustable regulator (item 165) is externally mounted as shown in the insert (item 165) and connected into the stock 5/16" OD return line, coming from tee piece in main 3/8" OD fuel supply line, using new fuel line (item 170).

3. THE FOLLOWING COMPONENTS ARE RETAINED FOR LATER RE-INSTALLATION

1. Airflow meter
2. EGR control valve
3. Spark plug wires/coil pack assembly
4. Front nose panel of car
5. Catalytic converter "Y" pipe assembly (new)
6. Plastic panels
7. Crash pad
8. Engine coolant

4. INSTALLATION OF NEW COMPONENTS

MANIFOLD/TURBO ASSEMBLIES – DIAGRAMS 1, 8

These would normally be supplied fully assembled and clocked, not in component form as shown in the diagrams for spare parts purposes. However, the one exception is the LHS actuator (item 87), clip (item 104), rod (item 88), nut (item 90) and bracket (item 94) which must be installed following LHS manifold/turbo assembly fitment.

The turbo/manifold assemblies would normally be supplied with the following components installed by the factory:

LHS			RHS		
ITEM	COMPONENT	DIAGRAM	ITEM	COMPONENT	DIAGRAM
1	Manifold	1	2	Manifold	1
3	Stud – 8mm	1	3	Stud – 8mm	1
4	Nut – 8mm	1	4	Nut – 8mm	1
5	Washer – 8mm	1	5	Washer – 8mm	1
6	Outlet	1	7	Outlet	1
16	Gasket	1	80	Centre	8
21	Plate	1	96	Comp hsg.	8
22	Bolt	1	83	Bolt	8
23	Washer	1	84	Turb. hsg.	8
80	Centre	8	85	Turbine clamp	8
81	Comp. hsg.	8	86	Bolt	8
83	Bolt	8	87	Actuator	8
84	Turb. hsg.	8	89	Rod	8
85	Turbine clamp	8	90	Nut	8
86	Bolt	8	91	Nut	8
112	Oil supply	9	92	Bolt	8
114	Drain	9	93	Bolt	8
115	Bolt	9	95	Bracket	8
116	Washer	9	104	"E" clip	8
121	Gasket	9	113	Oil supply	9
142	Water line	11	114	Drain	9
143	Water line	11	115	Bolt	9
145	Adaptor	11	116	Washer	9
150	Copper washer	11	121	Gasket	9
			144	Water line	11
			145	Adaptor	11
			146	Banjo	11
			147	Bolt – banjo	11
			150	Copper washer	11

Install quantity 4, 8 mm studs (item 3) in second from front/rear manifold mounting holes in cylinder heads, as shown in Diagram 1. Position stock manifold gaskets over the studs.

LHS ASSEMBLY

Carefully place a height adjustable drivetrain support Spin Jack, under the engine/trans assembly.

Remove LHS engine mount retaining bolt.

Unbolt lower shock mount, swaybar link and steering shaft coupling. Remove brake line retaining clip from lefthand end of crossmember.

Remove three LHS crossmember retaining bolts.

Loosen three RHS crossmember retaining bolts, until there is a 3" gap between crossmember and LHS lower crossmember face.

The preceding allows sufficient clearance to manoeuvre the turbo/manifold assembly into place from below and rest on the top of the crossmember. Install the actuator components (items 87,88,90,91,93,94)as illustrated in Diagram 8. The length of the actuator rod is set, so that it is half the diameter of the pinhole short, in its free condition. It must then be energised against its internal spring by pulling the rod out of the actuator and slipping it over the pin, retaining with clip (item 104). Position the complete assembly on the two previously installed studs, ensuring the stock gasket is still in place and that the turbo oil / water lines are correctly routed, as shown in Diagrams 5,9,11.

Lay RHS aircleaner / turbo silicon duct item 37),loosely in place between bottom of airconditioning compressor and top of crossmember, as shown in Diagram 6.

Re-fit the crossmember, suspension, brake line clip, steering coupling and LHS engine mount bolt. Ensure all fasteners are tightened to GM specification.

Loosely install nuts (item 4) and washers (item 5) onto the two studs.

Install stock bolts in the remaining positions. Tighten all fasteners to GM specification.

Refit LHS coil packs and plug wires.

There are two alternative air injection mounting positions. 1998/99 vehicles use the pad on the first runner. 2000-on vehicles use the pad on the second runner. A block off plate (item 21), retained by hardware (items 21, 22) and sealed by a gasket (item 16),is supplied for use on whichever pad is NOT required.

Install the air injection tube as per the stock position for the vehicle in question, using stock hardware and gasket (item 16).

Connect outer water hose (item 142) to adaptor (item 141) previously installed in side of block, as shown in Diagram 5. The tube may require a slight bend in order to clear the inner fender.

RHS ASSEMBLY

The RHS is now installed from below, positioning it over the two previously installed studs and gaskets. Insert the compressor inlet of the turbo charger into the previously positioned aircleaner silicon duct, (item 37). Install all fasteners as previously described.

If a 98/99 model, install EGR tube (item 18), using hardware (item 22, 23) and gasket (item 17). If a 2000 on model, the stock EGR tube will bolt directly to the manifold, but may require spacer flanges (item 24) for correct alignment.

Re-install RHS coil packs and spark plug wires. There is only one location for the RHS air injection tube, however flange orientation varies between 1998/99 and 2000 on models. Both patterns are provided for this purpose.

Re-install the air injection tube, using stock hardware and gasket (item 16). The tube may require a slight bend to clear the inner fender.

Re-install the EGR valve assembly.

AIR CLEANERS/MOUNTING BRACKET ASSEMBLIES

These are mounted as shown in Diagram 3 and 4. The air cleaner elements should be positioned so as to be as high and close to the outer face of the frame rails as physically possible. This is to leave as much room as possible for the intercooler installation.

INTERCOOLER ASSEMBLIES

Positioning of the intercoolers is achieved by mounting the outer brackets (items 50, 52) on the intercoolers and placing them on the stock stud, after modifying stock brackets as shown in Diagrams 3 and 4.

The inner brackets (items 49, 51) are then installed on the intercooler and 3/16" diameter holes drilled in the radiator support panel in order to fit screws (item 53).

HOSES

Install barbs (item 101) and plug (item 106) into pressure distribution block (item 102) and mount to engine using 5/16" hose (item 105) and clamps (item 103), between throttle body and electronic valve above LHS fuel rail, as shown in insert in Diagram 8.

Install ¼" boost sensing hoses (LHS-item 100, RHS-item 108) between the actuators (item 87) and barbs (item 101), using clamps (item 103). It is essential to route the hoses well away from any hot exhaust components.

Install the ¾" ID hose (item 77) between the air pump silencer using connector (item 73) and ¾" barb on LHS air cleaner mounts (item 26) as shown in Diagram 3, and in the insert in Diagram 7.

Install the 3/8" ID hose (item 30) between the RHS rocker cover breather and RHS air cleaner mount (item 27) as shown in Diagram 4.

Install the one way valve (item 40) using hoses (item 30) and clamps (item 31) in the PCV line as shown in the insert in Diagram 4. Ensure the arrow points at the throttle body.

Install a rubber cap (item 34) on the stock breather barb on RHS of the throttle body, using clamp (item 31) as shown in Diagram 7.

Install ¼" ID boost sensing hose (item 175) between fuel pressure regulator (item 165) and engine, as shown in Diagrams 7, 12, 13.

Route hose along fuel lines, retained by tie straps (item 176).

Connect to regulator using reducer (item 174) and 3/16" ID hose (item 180).

SILICON AIR DUCTING

2 ½" ID moulded silicon intercooler outlet ducts (items 56, 67) are installed through the ends of the crash pad support beam, as shown in Diagram 7. These can be loosely positioned over the upper discharge duct from each intercooler after placing a loose clamp (item 58) over each hose. Do not tighten yet.

2 ¾" ID moulded silicon air cleaner/turbo ducts (items 36, 37) are installed as shown in Diagram 5 and 6.

The LHS component (item 36) runs between the oil pan and the power steering box in the space vacated by the re-routed steel lines (items 38, 39). Ensure the clamps (item 29) are placed loosely over each hose end, for tightening after install is verified.

The RHS component (item 37) runs beneath the air conditioning compressor in the space vacated by the re-routed stock aluminum air conditioning line. The duct is intentionally oval to pass through this point. Again, remember to position the clamps (item 29) after ensuring both ducts are correctly located. Tighten all four clamps to 60 inch/lbs.

2" ID moulded silicon compressor discharge ducts – the two LHS compressor discharge ducts (items 41, 42) are installed as shown in Diagram 5 and 7. Leave all four clamps (items 45, 46) loose until hose support clamp (item 65) has been installed using the fasteners supplied (items 54, 55, 68, 78). Both hoses can be moved significantly to permit optimum clearance configuration. Tighten all clamps to 60 inch/lbs.

The RHS compressor discharge duct is installed as shown in Diagrams 6 and 7.Again as on the previous install, install the hose support clamp and optimise all clearances before tightening the clamps to 60 inch/lbs.

BRAIDED TEFLON LINES

The –6 water line connecting the two turbochargers (item 143) is connected as shown in Diagrams 9 and 11. The 5/8" ID heater hose must be cut as shown in the insert of Diagram 11 and tee piece (item 148) installed, using the two clamps supplied (item 149).

The –6 water line connecting the RHS turbocharger to the heater hose (item 144) is connected to the tee piece (item 148) as shown in Diagram 11.

The double male straight adaptor (item 109), one way check valve (item 118) and tee piece (item 111) is installed as shown in Diagram 9, after carefully applying Teflon thread sealer.

The –4 oil line (item 112) from the LHS turbocharger is connected to the forward facing port of the tee (item 111) as shown in Diagram 9.

The –4 oil line (item 113), from the RHS turbocharger is connected to the rear facing port of the tee (item 111).

TURBOCHARGER OIL SCAVENGE SYSTEM

The positioning of the turbochargers requires that the oil be pumped from each and returned to the engine oil pan at an appropriate position. This is achieved via scavenge tanks beneath each turbocharger and an electric pump, mounted beneath the radiator fans.

The scavenge tanks (items 123, 137) are mounted using bolts (item 93) and connected to each turbocharger oil drain using hose (item 119) and clamps (item 117). Ensure the RHS oil supply line(item113) and water line (item 143) are routed above the RHS scavenge tank.

Scavenge hoses (LHS item 124, RHS item 138) are connected to each tank and routed forward beside the oil pan, over the crossmember, as shown in Diagram 9.

The 90° adaptor (item 134) is installed in the discharge port of the electric scavenge pump (item 125) and the double male adaptor (item 140) in the intake port. Use Teflon sealer and do not over-tighten fittings as damage to the pump will result.

Install adaptors (item 135) in the Y'd ports of Y piece (item 139).

Connect the straight port to double male adaptor (item 140) already installed in pump inlet port, carefully applying Teflon sealer to all threads.

Mount the scavenge pump to its mounting bracket (item 126) using fasteners (items 128, 129, 130) as shown in Diagram 10.

Mount the complete assembly to the underneath of the front crossmember, by drilling three 3/16" holes and using self-tapping screws (item 127) as shown in Diagram 10.

Ensure that no part of the pump/bracket assembly is in contact with the adjacent stock fan shroud.

The scavenge lines (items 138, 124) can now be connected to the adaptors (item 135) previously installed in the Y piece (item 139).

A return port must now be drilled and tapped in the pan. This is illustrated in Diagram 5. It is positioned mid way across the front of the pan, angled at approximately 45° to the ground.

A 19/32" hole is carefully drilled, using substantial grease on the end of the drill bit. The hole is tapped (again with grease on the tape) to 3/8" NPT (pipe) and adaptor (item 135) installed using Teflon sealer.

The oil return hose (item 131) is installed between pump and adaptor, as shown in Diagram 10.

SCAVENGE PUMP ELECTRICAL CONNECTIONS

Mount the supplied relay (item 133) on inner LHS fender, close to stock power distribution block.

Connect black ground wire (number 86) to chassis .

Connect power wire (number 85) to stock distribution block.

Remove fuse cover and remove stock fuse AC / Cruise (15amp). Attach the small male fuse adaptor (supplied) to the stock fuse. Replace stock fuse in holder.
Connect wire (number 30) to the previously installed adaptor. Replace fuse cover.

Connect power wire (number 87), to scavenge pump power wire, with supplied Butt connector.

Connect scavenge pump ground wire to one of the pump mounting bracket screws, into the chassis.

EXHAUST SYSTEM INSTALL

This is shown in Diagram 1 and the following notes apply.

Ensure there is minimum ½" clearance between all stock heat shields and: manifolds; turbine housings; and turbine outlets. If not, modify heat shields to achieve.

The mounting flanges permit a degree of rotational orientation. The LHS pipe requires 1" clearance between the top of pipe and bottom of crossmember below driver's seat.

There should be minimum of ½" clearance between Y piece (item 19) and floor/bolt-on crossmember.

The exhaust is configured to readily slip over the stock 2 ¾" OD intermediate pipe (which should be cut to length as necessary), using band clamp (item 14), reducer (item 13) and clamp (item 15).

If an aftermarket 3" OD system is being used, delete reducer (item 13) and clamp (item 15).

If an aftermarket 3 ½" OD system is being used, cut off the reducer supplied as part of the Y piece (item 19).

Allen head bolts and washers (items 8, 9) retain the Y pipes to the outlet casting.

Band clamps (item 20) retain the Y pipes to Y piece (item 19).

Ensure all O2 sensors have been plugged back into the stock loom.

MAIN AIR DUCT INSTALLATION

Install 4" ID silicon hose (item 63) and two clamps (item 64) onto the stock throttle body, leaving clamps loose.

Install cast aluminum adaptor (item 62) into the 4" silicon hose (item 63).

Install 3 ½" silicon hoses (item 60) on either end of stock MAF meter, with clamps (item 61) left loose.

Install the meter/silicon hoses onto cast aluminum adaptor (item 62).

Install large "ram's horn" casting (item 59) as shown in Diagram 7.

Install 2 ½" ID silicon ducts (items 56, 57), together with clamps (item 58), positioning clamps but leaving them loose.

Insert "ram's horn" casting (item 59) into 3 ½" ID silicon hose on front of MAF meter.

Loosely install mounting brackets (item 70), using fasteners (items 67, 55) as shown in Diagram 7.

Energise the "ram's horn" casting towards engine so that it is in direct contact with the MAF meter, which is in turn in direct contact with the cast aluminum adaptor (item 62) which in turn is touching the throttle body.

The MAF meter should be parallel with the end of the "ram's horn" casting and sitting in the recess provided in the rear edge of the radiator support panel.

When correctly aligned, tighten the fasteners (items 67, 55) holding the mounting brackets (item 70).

Tighten the six clamps (items 61, 64) to 45 inch/lbs.

Tighten the four clamps (item 58) at each end of the 2 ½" ID silicon hose ducts (item 56, 57) to 60 inch/lbs.

Install 90° barb (item 79) and fit ¼" ID hose (item 175) from sensing port on regulator, as shown in Diagram 7.

Re-install stock loom plugs to MAF meter and IAT sensor. The loom may need to be carefully pulled forward through the mounting clamps on engine, in order to provide sufficient length.

5. RE-INSTALLATION OF STOCK COMPONENTS

Replace crash pad previously trimmed to clear the 2 ½" OD silicon ducts (items 56, 57) as shown in Diagram 2.

Replace the radiator air duct, previously trimmed to clear the 2 ½" OD silicon ducts (items 56, 57) as shown in Diagram 2.

Replace the front nose/valance panel.

Replace the lower plastic panels, previously trimmed to clear the intercoolers, as shown in Diagram 2.

Install lower support brackets (items 32, 33) as shown in inserts in Diagrams 3 and 4.