

812/852 Jet Assembly Process

Assembly preparation

Before jet assembly please clean up any paint/powder coating on machined surfaces, burs or disparities to ensure flat mating surfaces. Manually tap all threaded holes to clean out powder coated threads.

Tapping sizes and components

- Bearing housing grease nipple M8x1.25
- Jet intake bearing housing threads M8x1.25
- Jet intake pump mount threads M8x1.25
- Jet intake trim cable gland threads M12x1.75
- Jet intake stator stud threads M12x1.75
- Jet intake water tube threads ½" BSP
- Jet intake impellor housing face threads M6x1.0
- Stator anode threads M8x1.25
- Tailpipe bash plate, nozzle bowl, reverse spring and tailpipe side plate threads M8x1.25
- Tailpipe reverse bucket threads M12x1.75
- Tailpipe trim ram thread M6x1.0hi
- Nozzle bowl steering stop threads m8x1.25
- Deflector trim side arm holes m8x1.25
- Deflector trim ram arm thread M6x1.0
- Deflector nozzle insert thread M5x1.0i
- Reverse bucket tie rod thread m10x1.5

Jet intake Air bleed

Tools and components

- ¼" BSP right angle fitting to 3/8" hose x2
- 700mm 3/8" plastic tube
- Hand drill
- 11.5mm drill
- 15mm spanner
- 11/16 spanner
- ¼" BSP taper tap
- Pipe sealant (recommend Loctite master pipe sealant 567)

Drill out jet intake air bleed hole from front to 11.5mm approximately 20mm deep. Tap hole out to ¼" BSP using a taper tap. Only tap the thread depth of your taper tap. Apply same method and tap out front air bleed hole on intake leading into grill opening. Fit in the ¼" right angle. Fasten the other fitting to the front air bleed hole. Fasten using 15mm spanner. Apply pipe sealant to all fittings. Run 3/8" plastic tube between fittings. Lock tube in using 11/16 spanner.

Main Bearing fitment

Tools and components

- Bearing housing
- QJ309 main bearing
- Oxy acetylene gas plant
- Retaining compound Loctite (recommend LOCTITE 641h retaining compound)

Sit the bearing housing (powder coated face down) onto an aluminium bench top or soft jaws. Clean assembly oil off main bearing. Preheat internal bearing spigot of bearing housing using a neutral flame, circulate flame around internal spigot evenly for 1 minute. Put a cote of Loctite evenly around external of main bearing, drop bearing into housing ensuring bearing seats all the way down inside housing.

Nozzle assembly and bearing fitment

Tools and components

- Spherical bearings x4
- Trim ring
- Nozzle bowl
- Retaining compound Loctite (recommend LOCTITE 641)
- Thread locker Loctite (recommend LOCTITE 263 thread locker)
- M16x2.0 machined hex set screw
- M8 female rod end
- M8x40 Scott hex set screw
- M8 nylon nut x2
- M8 flat washer x1
- 13mm socket ¼" ratchet
- 13mm spanner
- Quick grip clamps

Fit steering linkage to trim ring using m8x40 hex Scott machined hex set screw and nylon nut using Loctite. Fit flat washer and nylon nut to protruding external thread. Clean external bearing surfaces and internal trim ring bearing surfaces. Evenly coat external bearing surfaces in retaining compound Loctite and fit vertical steering bearings into trim ring. Using m16 hex screws and 24mm socket fit trim ring to nozzle bowl (note Loctite threads internally on nozzle bowl before installing screws). Check ease of steering than Loctite and fit horizontal/trim spherical bearings. Use carpentry type quick grip clamps to secure spherical into ring allow set time (minimum 2 hours)

Wear ring fitment

Tools and components

- Impellor housing
- Impellor housing insulator
- Impellor housing wearing
- Stator housing
- Stator housing insulator

- Stator housing wearing
- Wearing installation jig
- Hammer
- Hand linisher
- Inox (lubrication)
- Flat head screwdriver (For insulator clean up)

Sit impellor housing on wooden surface, fit insulator material inside external spigot ensuring it is trimmed to ensure a tight fit. Scribe or mark a line at 1 and 2mm back from end off s/s wearing. Sand/cut a 45degree angle on scribed corner of wear ring approx. 6mm along each plain. Using this as a point of entry fit wear ring inside protruding insulator material. Using wearing jig and hammer tap wearing inside housing and insulator, moving jig circular around contact point of wear ring evenly hitting wear ring in until flush with surfaces note. If wear ring is to tight it will not punch into housing or will split insulator materials. If this is the case trim/sand length of wear ring as marked previously than repeat step. Trim excess insulator material off. Repeat step with stator housing

Cutlass bearing fitment

Tools and components

- 1.75" cutlass bearing 57mm long x2
- 812/852 stator
- 812/852 tailpipe
- Hammer
- Cutlass installation jig
- Grease (recommend SKF marine grade)

Cutlass bearings are an interference fit into the housings so require lubrication on both the internal and external surface of the mating areas. Ensure chamfers on entrée points of contact. Tap cutlass bearing into ab2 stator housing using cutlass installation jig. Ensure tailpipe bottom surface is on rigid wooden surface to avoid damage of housings. Repeat process on tailpipe punching cutlass down flush with cutlass entrée point

Main shaft assembly

Tools and components

- 812/852 main shaft
- 812/852 bearing spacer
- Bearing housing
- 812/852 drive flange
- 812/852 main shaft washer
- M12 bevelled washer
- M12x1.75x30 hex set screw
- Retaining compound Loctite
- Main shaft 10x10 key
- M6x1.0 grease nipple

- 10mm socket ¼" ratchet
- Bearing housing oil seal
- SKF bearing grease
- 19mm socket
- ½" drive torque wrench
- M5x10 c-sunk slot screws x3
- M6 flat washers x3

Grease and Fit oil seal into spigot on bearing housing. Fit 3x M5x10 c-sunk slot screws and M6 flat washers into oil seal retaining screw holes. Fit grease nipple into bearing housing using 8mm socket. Fit inner main bearing races to bearing spacer spigot and drive flange spigot. Having main shaft securely fixed vertically for ease of work on main bearing end. Fit bearing spacer to main shaft. Apply even coat of bearing fit Loctite to internal circumference off drive flange. Pack the main bearing full of grease than fit to main shaft. Fit drive flange to main shaft making sure to align key slots than fit key into slot. Ensuring drive flange is protruding approx. 2mm above the main shaft and key. Fit the main shaft washer, bevelled washer, then screw in the m12 hex set screw (apply Loctite). Torque to 60 ft/lbs. Rotate bearing assembly to ensure smooth operation.

Locating ring and main shaft assembly

Tools and components

- 812/852 locating ring
- 812/852 locating ring oil seal
- 1.75" carbon seal
- 80x3.5 O-ring x2
- Dishwashing liquid
- Hammer
- Oil seal installation tool
- M6x50 hex set screw
- M6 nylon nut
- 10mm socket and ¼" ratchet
- 10mm spanner

Grease and Fit oil seal using installation tool, Fit O-ring to external spigot than flip locating ring. Note the order the carbon seal is removed from packaging as this is how it will be fitted to main shaft assembly. Fit the stationary/elastomer seal into the locating ring white face up. Again, fit O-ring to the external spigot. Sit the main shaft assembly drive flange end down on work bench or soft jawed vice. Fit assembled locating ring over shaft mating the oil seal side down on main bearing ensure the O-ring and oil seal have mated correctly. Cover the main shaft in a light layer of dishwashing liquid, fit the bellow seal followed by the spring and retainer. Fit the hex set screw and nut through the main shaft hole to compress the spring locking down the retainer. Note. Grease all oil seals and O rings for ease of assembly.

Nozzle assembly pt.2

Tools and components

- 812/852 Nozzle bowl and trim ring
- 812/852 Trim side arms
- Steer/rev bushes x2
- M8x30 hex set screw x4
- M8 spring washers x4
- M10x25 c-sunk socket screws x2
- Thread locker Loctite
- M6x25 button cap screw
- 111mm nozzle insert
- M5x20 pan slot head screwsx3
- M5 spring washers
- Lock wire
- Lock wire pliers
- 13mm ¼" socket and short extension
- 13mm spanner
- 5mm hex head ½" socket and ratchet
- Vice grips
- Battery drill
- 2.5mm drill piece
- 4mm Allen wrench
- Marine grade sealant (recommend sabre bond SMP60)
- Hammer
- Steer/rev bush installation jig
- M8x45 hex bolt x2 (steering stops)
- M8 hex nut x2 (steering stops)
- M8 spring washer x2 (steering stops)

Fit trim side arms into horizontal spherical bearings, fix with 2x m10 c-sunk socket screws. Apply Loctite around thread. Fasten using 3/8" ratchet with 5mm driver. Fit m6x25 button socket screw thru deflector trim ram bracket from the centre outwards apply Loctite. Fasten with 4mm Allen wrench. Fit the deflector inside nozzle bowl with deflector trim ram brackets central between steer/rev shaft lugs on nozzle bowl. Fit trim side arms into deflector recesses and fix with m8x30 hex set screws and spring washers. Fasten with 13mm ¼" socket and extension within battery drill for quick fastening. Nip up tight with open end ring spanner. Check internal clearance between bowl and deflector shifting it through its arcs. Drill lock wire holes using 2.5mm drill bit top and bottom of nozzle bowl. One through centre off steering lug and another on the bottom horizontal plain. Fit safety lock wire from two machined steering screws too drilled lock wire holes. Ensure safety wire is pulling screws in a clockwise rotation to hold these screws from potentially loosening. Fit 111mm nozzle insert with 3x m5x20 pan slot screws and spring washers. Tighten with flat head screwdriver. Screw the m8 hex nut onto the m8 bolt until the end of the thread, fit the spring washer than screw into steering stop bolt hole on nozzle bowl, repeat on opposite side. Apply sealant on the outer spigot of both the steering bush and reverse bush. Fit inside nozzle bowl steering and reverse lugs. Lightly press or tap in using hammer and jig.

Jet intake assembly

Tools and components

- 812/852 jet intake
- 812/852 main shaft assembly
- M8x45 hex set screw, spring and flat washer
- M12 stator studs
- Loctite
- 13mm socket ¼" drive ratchet
- 13mm spanner
- M12 stud locking socket ½" driver ratchet
- 17x3.5 O ring x2 (steer and rev shaft O rings)
- Steering/reverse bush x2
- Marine sealant
- Steering shaft
- Manual Reverse lock out arm (if set up for manual controls reverse)
- Reverse shaft (refer to spec sheet whether hydraulic or manual option)
- Grease
- M12 trim hose cable glands
- Pipe sealant
- 15mm spanner,

Fit main shaft assembly forward through jet intake ensuring forward O ring is seated correctly on locating ring. This needs to seat correctly making for a watertight seal. Once the bearing housing has seated all the way inside intake spigot (tight clearance fit) Fit 4x m8x45 hex set screws, springs and flats fixing the bearing housing/ main shaft assembly inside the intake. Fasten using 13mm ratchet followed by a 13mm spanner. Water test jet by running flowing water at carbon seal face to check seals have seated correctly. Water will leak from recess/ water passage below bearing housing on front of jet if there has been a manufacturing fault. Jet intake can now be fastened to assembly table/fixture. Install steering shaft through intake installation hole from front to back on navigator side of jet, grease steer/rev shaft O ring, slide it over installed steering shaft (install manual reverse lock out arm first for manual option). Apply sealant to steering bush and slide over steering shaft. Use bush installation jig and lightly tap bush and O ring into jet intake recess making for a watertight seal around shaft, repeat process with reverse shaft. Install 4x stator studs using m12 stud socket and ratchet, Loctite threads. Fasten trim hose cable glands into intake using m12 trim hose gromets and 15mm spanner, apply pipe sealant.

Impellers, housings and tailpipe

Tools and components

- impellor housing
- m6x25 hex set screw x3
- m6 flat washer x3
- m6 spring washer x3
- impellor spacer

- front impellor key 10x10x85
- front impellor (check specification sheet for pitch)
- 852/812 chrome sleeves x2
- Rear impellor key 10x10x60
- Rear impellor (check specification sheet for pitch)
- M20 main shaft nut
- Tail pipe
- M12 nylon nuts x4
- M12 flat washers x4
- Water pick up O rings x6
- 10mm ring spanner
- Never seize (recommend RTD)
- 30mm socket ½" drive strong arm
- 19mm socket ½" drive ratchet
- M8x25 button cap screw, plain nut and spring washer
- Grease

Fit 4x water pick up o rings into impellor housing. Fit impellor housing into intake spigot. Fasten to intake with m6x25 hex set screws, spring washers and flat washers through fixture holes (10mm spanner). Fit impellor spacer sleeve to front of shaft than fit front impellor key. Coat the shaft in a light film of never-seize than fit front impellor over shaft into housing. Fit chrome stator sleeve than stator housing. Fit rear impellor key and ensure there is still a light film of never seize where impellor surfaces will touch main shaft. Fit rear impellor followed by chrome sleeve and m20 main shaft nut. Tighten using a 30mm socket ½" drive to 80ft/lbs. To lock jet from rotating place a soft material into the internal assembly rotating mass of the jet locking it between the impellor and stator veins. Option 2. put screws into the drive flange and lock between them with a pry bar (note. this is not always applicable if jet is installed/coupled up to an engine) Fit water pick up O rings to tailpipe, fit tailpipe to jet and fasten up stator studs with flat washers and nylon nuts. Apply never-seize to m12 stator studs for future maintenance assistance. Fasten up with 19mm socket and ½" drive ratchet. Fit reverse spring screw (m8x25 button cap screw, plain nut, spring washer) located on top of tailpipe. Rotate drive flange by hand to check operation (this rotates internal assembly of jet to check internal operation and clearances) note. Grease all O rings.

Nozzle and bash plate fitment

Tools and components

- 812/852 nozzle assembly
- 812/852 bash plate
- M8x40 hex set screws x2
- M8x45 hex set screws x2
- M8x25 hex set screw x2
- M8 spring washers x6
- M8 flat washers x8
- 13mm socket ¼" ratchet

Fit steering nozzle onto rear tailpipe flange, only fix with top two screws (2x m8x40 hex set screws, spring and flat washers) Fit bash plate to bottom of jet and fit two bottom M8x45 hex set screws, spring and flat washers leaving loose. Fix two m8x25 screws, springs and flats to bottom tailpipe and bash plate holes spacing them apart using a flat washer. Proceed to fasten rear bash plate and nozzle bowl screws (m8x45 hex set screws, spring and flat washers) into tailpipe. Fasten screws with a 13mm ¼" ratchet.

Steering and reverse crank

Tools and components

- Steering crank
- Reverse crank
- M8 male rod end and plain nut
- M8x40 hex set screw
- M8 flat washer
- Nylon nuts x2
- M8x40 hex bolts x3
- M8 spring washers x4
- M8x25 hex set screw
- M8 penny washer
- M20 flat washer
- 3mm s/s cotter pin
- Grease
- 13mm socket ¼" ratchet

Fit 20mm s/s washer over steering shaft. Grease steering and reverse shaft in front of intake to allow ease of movement through O rings. Slide steering shaft back through nozzle bush and fit steering crank. Install m8x40 hex bolt and spring washer too crank securing it to shaft. Fit s/s cotter pin Infront of m20 washer. Fit M8 Male rod end and lock nut too female on trim rig. Connect to steering linkage on crank using M8x40 hex set screw, flat washer, g nylon nut, crank than nylon nut. Fit reverse crank and 2x m8x40 hex bolts and spring washers to reverse shaft. Fasten tightly holding crank in a clockwise rotation taking up any rotational slack in slots. Slide shaft through nozzle bush and secure with m8 penny washer, spring washer and m8x25 hex set screw.

Reverse bucket fitment

Tools and components

- 812/852 reverse bucket (812 small bucket 852 split duct bucket)
- Reverse bucket bushes x2
- M12x55 hex bolts x2
- M12 penny washers x4
- M12 spring washers x2
- M8x30 button cap screw
- M8 nylon nuts x2
- M8 flat washers x2
- Thread locker

- 19mm socket ½" ratchet
- 5mm Allen key
- 13mm open end spanner
- M10x60 hex set screw
- M10x50 hex set screw
- M10 nylon nut x4
- M10 flat washers x3
- Reverse linkage. 2x m10 male rod ends 2x plain nuts
- 17mm socket 3/8" ratchet
- 17mm spanner
- Grease
- Reverse bucket s/s side mounts x2
- M8x25 hex set screws x4
- M8 spring washers x4
- Reverse spring

Fit reverse linkage to internal of reverse bucket using the m10x60 hex set screw flat washers and nylon nuts. Internal nylon nut to be reversed on to allow greater movement from rod end. Fit reverse spring screws to reverse bucket. Grease external of reverse bucket bushes and fit into pivot holes off each reverse bucket arm. Fit s/s reverse bucket side brackets using m8x25 hex set screws and spring washers with Loctite. Leave brackets loose to allow easier fitment of reverse bucket. Loctite m12 reverse bucket threads on internal tailpipe threads (stops contamination from grease). Using the m12x55 hex bolts and spring washers attach reverse bucket through s/s side brackets, grease external of bolts to allow lubrication between bush and reverse bolt. Fasten tightly with 19mm socket and ½" ratchet. Tighten s/s tailpipe side arms. Fasten reverse linkage to reverse crank (m10x50 hex set screw nylon nuts and flat washer) Fit reverse Spring.

Manual reverse set up

- Manual s/s roller bush
- M8x35 hex bolt, 2 flat washers and nylon nut
- 13mm socket ¼" ratchet
- 13mm spanner
- 17mm spanner
- 17mm socket 3/8" drive ratchet

Install roller bush into manual reverse arm and manual shaft d-tent. Check operation of reverse bucket making sure roller bush hooks into all d-tents on reverse shaft arm. If reverse bucket does not lock all the way into the top d-tent/ notch adjust length on the reverse bucket linkage. Lengthen linkage to get reverse lock out arm in top reverse notch. If bucket is sloppy and falls out of top reverse arm D-tent shorten linkage.

Hydraulic reverse set up

Tools and components

- Reverse ram, plain nut and m10 female rod end

- Hydraulic lines and fittings
- Reverse pump
- Jet intake hydraulic ram and pump mount
- Hydraulic reverse ram mount
- Reverse pump mount
- M10x60 hex bolts x3
- M10 nylon nuts x3
- 3/8" UNC x 3/4" hex set screws (pump screws)
- M8x25 hex set screws and spring washers (mount to intake screws)
- M10x30 hex set screw and nylon nut (rod end to reverse arm)
- Pipe sealant (recommend Loctite master pipe sealant 577)
- 13mm sockets 1/4" short extension
- Drill
- 17mm spanner
- 17mm socket 3/8" drive ratchet
- 18mm spanner

Fit reverse mount plate to jet intake using m8x25 hex set screws and spring washers. Attach 13mm socket and extension to drill for speed of fastening. Nip up with ratchet. Fit reverse pump mount and ram mount using m10x60 hex bolts and nylon nuts. Attach ram connecting through ram mount first using m10x60 hex bolt and nylon nut. Fasten rod end to s/s reverse shaft (m10x30 hex set screw and nylon nut) 17mm spanner and ratchet. Check reverse bucket operation. Ensure on full extension of ram reverse bucket connects to reverse stop (reverse tie rod bolt head). Shorten tie rod to give reverse bucket more movement up to meet stop. Shorten tie rod if ram is not fully extending before bucket meets rev stop. Pump can now be mounted to pump mount plate using 3/8" UNC screws. Fasten with 9/16" socket and ratchet. Apply pipe sealant too ram fittings and nip up (18mm spanner). Fit pump fittings (these are O-ringed so do not require sealant) run hoses between pump and ram.

Trim Ram

- Trim ram
- 5/16UNF female rod end
- 5/16UNF plain nut
- 13mm spanner
- 12mm spanner
- 6-8mm s/s sleeve
- M6x25 hex set screw and spring washer
- M6 nylon nut and spring washer
- 10mm socket 1/4" ratchet

Fasten 5/6UNF plain nut followed by rod end to ram. Lock rod end on by tightening against plain nut using 12mm and 13mm spanner. Fit trim ram at deflector end first applying a m6 spring washer, 6-8mm spacer sleeve, ram rod end than nylon nut. Fit ram into trim ram slot on tailpipe than fasten with m6x25 hex set screw and spring washer using 10mm socket and ratchet

Grill fitment

Tools and components

- 812/852 grill (check specification sheet for chosen grill option)
- 3/8" UNC x 1 1/2" long hex set screws and spring washers (front grill screws) x2
- 3/8" UNC x 2" long hex set screws and spring washers (rear grill screws) x2
- Sealant (marine grade)
- 9/16 socket 3/8" drive socket

Apply light layer of sealant to top face of grill front and rear. Apply generous coat off sealant to front and rear grill bolts. Fit grill using 3/8" UNC x1 1/2" long grill screws with spring washers to front. Use 3/8" UNC x 2" long screws and washer for rear. Fasten tight with 9/16" socket and ratchet.

Jet greasing

Tools and components

- Right angle scriber
- SKF bearing grease

Using a right-angle scriber seat end into grease pocket between bottom side of drive flange oil seal. Pump grease int grease nipple until grease protrudes out where scriber is seated. This ensures adequate amount of grease and grease has circulated all the way around main bearing.

Fit stickers and QA check over