



# Reyco Granning SUSPENSIONS

## Model 345P

### Drive Axle Air-Ride

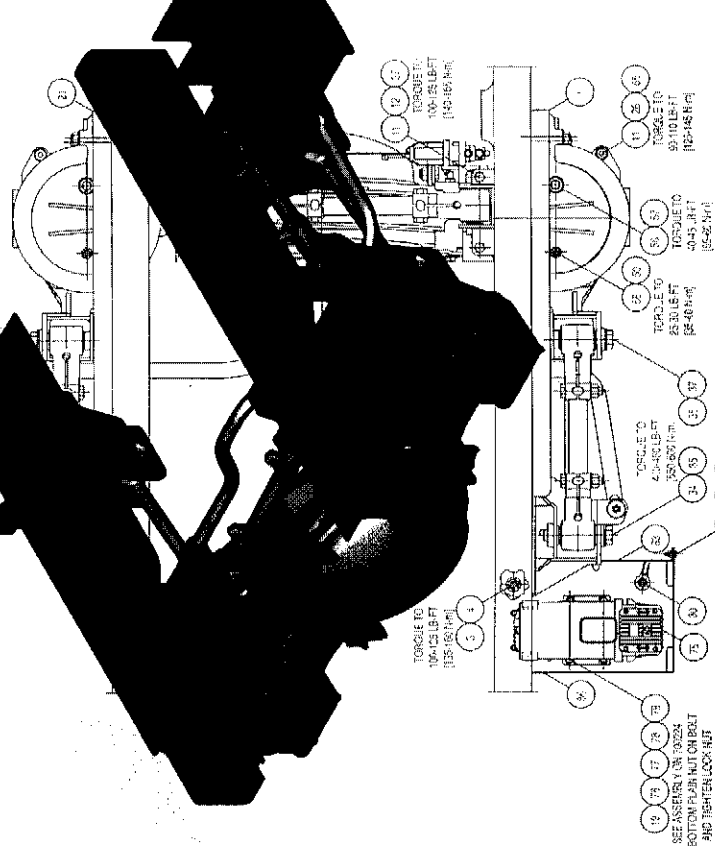
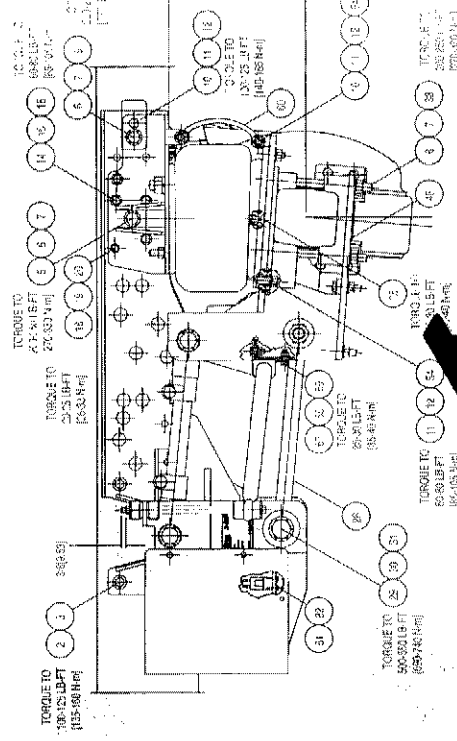
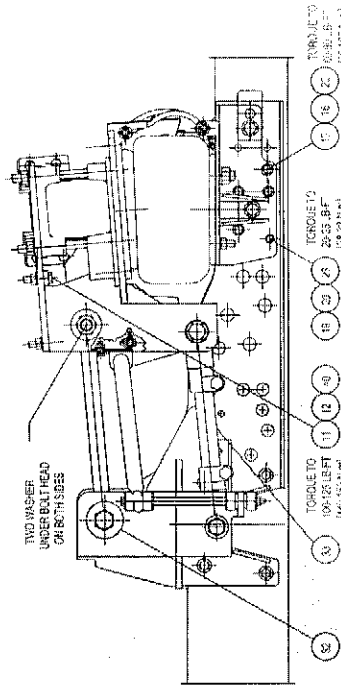
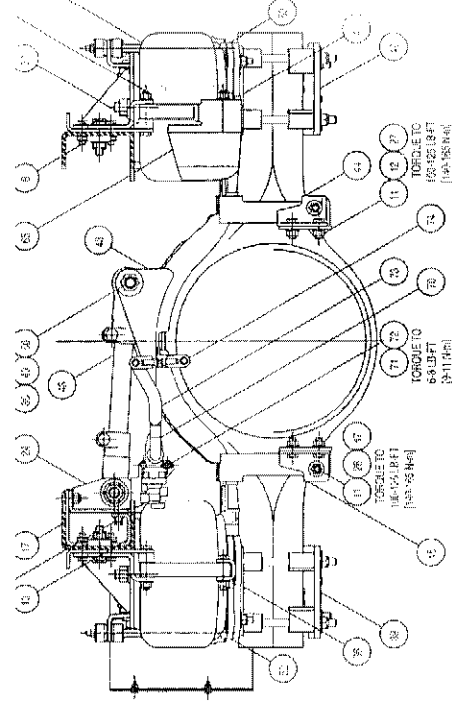
### Suspension System



### Maintenance Procedures



**TUTHILL**  
Transport Technologies



# Maintenance Guidelines

## GUIDELINES OVERVIEW ○ i.1

- Air Ride Suspension Maintenance ○ i.1
- Mechanical Components ○ i.2
- Air System Components ○ i.2
- Shock Absorbers ○ i.3
- Fasteners & Bushings ○ i.3

## MAINTENANCE SCHEDULE ○ i.4

## MAINTENANCE RECORD ○ i.5

## TROUBLE SHOOTING ○ i.6

## TORQUE SPECIFICATIONS ○ i.7

- Torque Table ○ i.7

## SUSPENSION BILL OF MATERIALS & DRAWINGS ○ i.8

- Bill of Material - 99655 ○ i.8
- Suspension Drawing - 99655 ○ i.8
- Bill of Material - 99212 ○ i.8
- Suspension Drawing - 99212 ○ i.8
- Bill of Material - 700224 ○ i.8
- Suspension Drawing - 700224 ○ i.8

## Maintenance Procedures Model 345P

### AIR RIDE SUSPENSION MAINTENANCE GUIDELINES

This Maintenance Manual describes the correct procedures for the ReycoGranning Model 345P Drive Axle Air Ride Rear Suspension. The Model 345P is the overall "family number" for a series of individual suspensions, designed individually for Ford Truck Models F350, F450, and F550 vehicles. Most of this manual is common to all of those models, but there will be information that is particular to your truck. Please access that information particular to your vehicle.

You must follow common sense safety procedures when you service or maintain a vehicle's suspension. Follow already published guidelines for working on powered equipment. Be sure you read and understand all limitations and ratings of equipment used during service, repairs, and maintenance procedures.

Tuthill Transport Technologies (makers of ReycoGranning Air Suspensions), reserves the right to modify the suspension and/or procedures, and to change specifications at any time without notice and without incurring obligation. It is your responsibility to verify that the information is current.

These guidelines provide a list of proper maintenance considerations for the Reyco/Granning (R/G) family of Model 345P Suspensions. This guideline covers the air ride system, which includes:

- Mechanical Components;
- Air System Components;
- Shock Absorbers;
- Fasteners and Bushings.

## **MECHANICAL COMPONENTS**

Make sure all suspension hangers, parallel arms, axle brackets, and track rod system are mounted properly. Mounting fasteners should be tight and torqued to the R/G specifications, listed on page m-7. The mechanical operation and function of the suspension should be checked to R/G drawings and specifications, included on pages m-9 thru m-16.

## **AIR SYSTEM COMPONENTS**

The air system is defined to include the air springs, air lines, air tanks, and all associated valves, including the leveling valve. A schematic of the air system is presented on page m-16. Normal air system maintenance must be performed periodically because water, dirt, and other contaminants can cause damage. Draining the air tanks, weekly, can greatly reduce this damage. Every 25,000 miles, it is recommended that the following items be inspected/maintained:

- The leveling valve is the "brains" of the operational air system. It constantly adjusts the "Ride Height", depending on road conditions and cargo load changes. Make sure the valve is operational, and doing its job properly. There should be no interference around the valve or its linkage.
- This unit has an air line filter. It must be periodically checked for good operation, and changed if plugged. Make sure air lines are not damaged.
- Rubber air springs should be visually inspected for cracks, gouges, distortions, aging, and chaffing. Keep air springs clean from road debris.
- Make sure air system isn't leaking, and wasting compressor life. Air suspensions should stay inflated several days, without leaking down. Check for leaks using a soapy water solution, sprayed on connections, and valves.

## Maintenance Procedures Model 345P

### SHOCK ABSORBERS

Shock absorbers are designed to dampen air spring and ultimately, vehicle oscillations. Shocks should be inspected fairly frequently (every 25,000 miles) for loss of effectiveness, and leakage. "Leakage" is the actual dripping of the hydraulic fluid, from the shock. "Misting" is the buildup of an oily, smudgy, residue on the body from the grease seals, and is NOT abnormal for these heavier duty shocks. Inspect end bushings for wear, aging, and damage. Replace leaking shocks, or damaged bushings.

### FASTENERS AND BUSHINGS

All fasteners must remain tightened to R/G specifications, for the suspension to do its job safely, and properly. Retorquing fasteners early in the life of the suspension (~1000 to 3000 miles) is very rewarding in attaining long, trouble-free performance. Fasteners should be tightened per the requirements listed on page m-7. Bushings should be inspected for wear and degradation every 25,000 miles. Replace bushings when worn, or when tire wear or misalignment starts increasing.

# Maintenance Schedule

| MAINTENANCE SCHEDULE             |                                                   |                        |    |    |    |     |
|----------------------------------|---------------------------------------------------|------------------------|----|----|----|-----|
| Maintenance Item                 | Service to be Performed                           | Mileage (X 1000 Miles) |    |    |    |     |
|                                  |                                                   | IS-1*                  | 25 | 50 | 75 | 100 |
| Axle-Bolts/Brackets              | Check nut torque                                  | X                      | X  | X  | X  | X   |
| Front Hangers                    | Check mounting bolt torque                        | X                      | X  | X  | X  | X   |
| Axle Bridge & Track Rod Assembly | Check mounting fasteners                          | X                      | X  | X  | X  | X   |
| Parallel Arms & Bushings         | Check nut torque                                  | X                      | X  | X  | X  | X   |
|                                  | Inspect for bushing wear                          |                        | X  | X  | X  | X   |
|                                  | Inspect for contact at sides                      | X                      | X  | X  | X  | X   |
|                                  | Check for proper fastener torque                  | X                      | X  |    |    |     |
|                                  | Inspect for proper clearance                      | X                      |    |    |    |     |
|                                  | Inspect for chaffing or wear                      |                        | X  | X  | X  | X   |
| Air Springs                      | Inspect for leaks (soapy water)                   | X                      | X  | X  | X  | X   |
|                                  | Inspect for bending, binding                      | X                      | X  | X  | X  | X   |
|                                  | Check mounting nut torque                         | X                      | X  |    |    |     |
| Shock Absorbers                  | Check for leakage, worn bushings, broken eye ends | X                      | X  | X  | X  | X   |
|                                  | Inspect for leaks (soapy water)                   | X                      | X  |    |    |     |
|                                  | Inspect for chaffing, wear, cracks                | X                      | X  | X  | X  | X   |
| Air Fittings & Lines             | Check for proper alignment                        | X                      |    | X  |    | X   |

\*IS-1 indicates procedure to be done at In-Service to 1000 miles period.

[illegible]

# Trouble Shooting

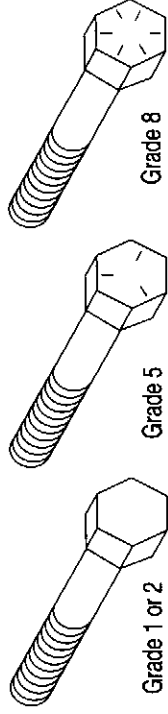
| TROUBLESHOOTING                                                                                                                                             |                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                               |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Suspension System - General                                                                                                                                 |                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                               |  |
| Symptoms                                                                                                                                                    | Possible Cause                                                                                                                                                                                                                                 | Remedies                                                                                                                                                                                                                                                                                      |  |
| Tires wear out quickly or have uneven tire tread wear.<br><br><b>NOTE:</b> Wear pattern will indicate possible cause(s). Consult manufacturer for guidance. | 1) Tires have incorrect pressure.<br>2) Tires are out of balance.<br>3) Incorrect ride height.<br>4) Incorrect rear axle alignment.<br>5) Improper (mismatched) tires and wheels.                                                              | 1) Put specified air pressure in tires.<br>2) Balance or replace tires.<br>3) Adjust ride height to specified setting.<br>4) Align rear axle to specified thrust angle.<br>5) Install correct tire and wheel combination.                                                                     |  |
| Vehicle rolls side to side excessively.                                                                                                                     | 1) Front and/or rear shock absorbers worn.<br>2) Shock mounting loose.<br>3) Shock eye bushings worn.<br>4) Parallel arm pivot bushings worn.<br>5) Internal leak in height control valve.                                                     | 1) Replace shock absorbers as needed.<br>2) Check and tighten as required.<br>3) Check and replace as needed.<br>4) Inspect and replace as required.<br>5) Check height control valve and replace as required.                                                                                |  |
| Vehicle ride is too harsh and/or suspension contacts stops excessively.                                                                                     | 1) Shock absorbers worn.<br>2) Incorrect ride height.<br>3) Vehicle overloaded.<br>4) Air spring supply lines leaking or obstructed.<br>5) Vehicle system air pressure below specifications.<br>6) Jounce bumper in air spring worn or broken. | 1) Replace shock absorbers as needed.<br>2) Adjust ride height to specified setting.<br>3) Check wheel loads and correct as needed.<br>4) Check air line connections and remove obstructions.<br>5) Check air pressure and correct as needed.<br>6) Check and replace air spring as required. |  |
| Vehicle ride is too soft.                                                                                                                                   | 1) Shock absorbers worn.<br>2) Incorrect ride height.                                                                                                                                                                                          | 1) Replace shock absorbers as needed.<br>2) Adjust ride height to specified setting.                                                                                                                                                                                                          |  |
| Suspension does not maintain ride height.                                                                                                                   | 1) Air leak.<br>2) Internal leak in height control valve.<br>3) Height control valve linkage loose.<br>4) Air spring chafed or worn.                                                                                                           | 1) Check connections with soapy water solution and repair or replace as needed.<br>2) Check height control valve and replace as required.<br>3) Check and tighten linkage as needed.<br>4) Check air spring and replace as needed.                                                            |  |



### TORQUE SPECIFICATIONS

Most threaded fasteners are covered by specifications that define required mechanical properties, such as tensile strength, yield strength, proof load, and hardness. These specifications are carefully considered in initial selection of fasteners for a given application. To assure continued satisfactory vehicle performance, replacement fasteners used should be of the correct strength, as well as the correct nominal diameter, thread pitch, length, and finish.

#### BOLTS - Grade Markings



#### LOCK NUTS - Grade Markings



| TORQUE TABLE                            |               |            |
|-----------------------------------------|---------------|------------|
| Axle Bolt Nuts, 5/8"-18UNF              | 225-250 Ft-lb | 305-339 Nm |
| Parallel Arm End Nuts, Top, 7/8"-14 UNF | 400-425 Ft-lb | 545-576 Nm |
| Parallel Arm End Nuts, Bot'm, 1" -8UNC  | 500-550 Ft-lb | 680-746 Nm |
| Track Rod End Nuts, 7/8"-14UNF          | 400-425 Ft-lb | 545-576 Nm |
| Axle Bridge Mount Nuts, 1/2" -20UNF     | 115-125 Ft-lb | 155-169 Nm |
| Axle Bottom Plate Nuts, 1/2"-20UNF      | 115-125 Ft-lb | 155-169 Nm |
| Lower Air Spring Plate Nuts, 1/2"-20UNF | 115-125 Ft-lb | 155-169 Nm |
| Restraint Strap Nuts, 1/2"-20UNF        | 115-125 Ft-lb | 155-169 Nm |
| Air Spring Mount Nut, Top, 1/2"         | 25-30 Ft-lb   | 35-40 Nm   |
| Air Spring Mount Nut, Top, 3/4"         | 40-45 Ft-lb   | 55-60 Nm   |
| Air Spring Mount Nut, Bot'm, 3/8"       | 15-20 Ft-lb   | 20-28 Nm   |
| Height Control Valve/Linkage Nuts, 1/4" | 5 Ft-lb       | 7 Nm       |

## Bill of Material - 700651/F350

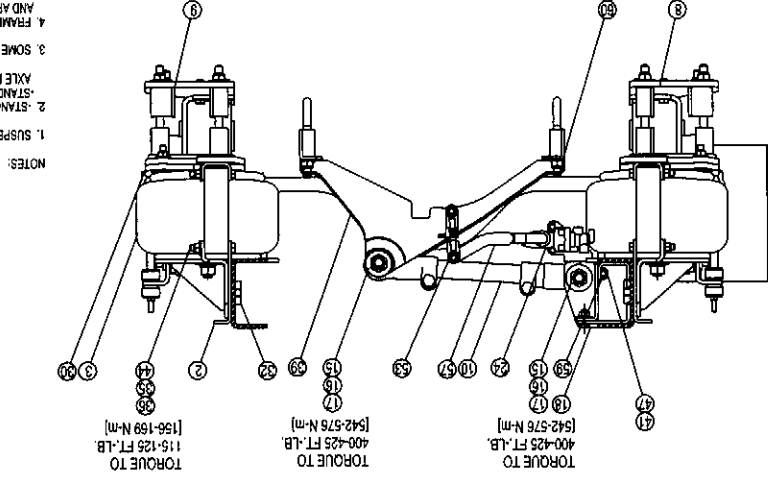
| BILL OF MATERIAL |           |         |                                      |     |
|------------------|-----------|---------|--------------------------------------|-----|
| ITEM             | PART NO.  | DWG NO. | DESCRIPTION                          | QTY |
| 1                | 25192-01  | 99210   | FRONT HANGER W/ RAIL - LEFT          | 1   |
| 2                | 25805-01  | 99211   | FRONT HANGER W/ RAIL - RIGHT         | 1   |
| 3                | 25220-01  | 99239   | AIR SPRING                           | 2   |
| 4                | 25221-01  | 99240   | TORQUE ARM - FIXED                   | 2   |
| 5                | 1035-1575 | 1035-XX | TORQUE ARM - ADJUSTABLE              | 2   |
| 6                | 25698-01  | 99634   | AXLE HANGER - LEFT                   | 1   |
| 7                | 25699-01  | 99635   | AXLE HANGER - RIGHT                  | 1   |
| 8                | 25730-01  | 99660   | AXLE CLAMP - LEFT                    | 1   |
| 9                | 25734-01  | 99664   | AXLE CLAMP - RIGHT                   | 1   |
| 10               | 1035-17   | 1035-XX | TRACK ROD - ADJUSTABLE               | 1   |
| 11               | 20005-01  | 62158   | HEX BOLT 7/8-14UNF X 4 1/2 GR 5      | 2   |
| 12               | 18632-01  | 62158   | HEX BOLT, 1-8UNC X 6 GR 5            | 4   |
| 13               | 25687-01  | 93281   | LOCK NUT, 1-8UNC GR C                | 4   |
| 14               | T-5770    | 93403   | FLAT WASHER, 1"                      | 6   |
| 15               | 17637-01  | 62158   | HEX BOLT 7/8-9UNC 5 GR. 5            | 2   |
| 16               | 10092-01  | 93281   | LOCK NUT, 7/8-9UNC 2B                | 2   |
| 17               | T7292     | 71078   | WASHER, FLAT 7/8                     | 4   |
| 18               | 25684-01  | 99629   | TRACK ROD BRACKET ASSEMBLY           | 1   |
| 19               | 12920-01  | 93280   | NUT - 1/2"                           | 2   |
| 20               | T-1705    | 62159   | LOCKWASHER - 1/2"                    | 2   |
| 21               | 08211-01  | 93280   | NUT - 3/4"                           | 2   |
| 22               | T-3164    | 62159   | LOCKWASHER - 3/4"                    | 2   |
| 23               | 25219-01  | 99238   | SWAY BAR                             | 1   |
| 24               | 22008-05  | 95180   | HCV HADLEY 500 - 1/4 NPT FITTING     | 1   |
| 25               | 25680-01  | 62158   | HEX BOLT 1/4-20UNC-2A 3 GR. 5        | 2   |
| 26               | 22951-01  | 93281   | LOCKNUT 1/4-20UNC-2B GR. C           | 2   |
| 27               | 25688-01  | 62158   | HEX BOLT 5/8-18UNF 8 1/2 GR 8        | 8   |
| 28               | 12893-01  | 93282   | LOCKNUT - 5/8-18UNF GR. C (A)        | 12  |
| 29               | 23148-01  | 93403   | FLAT WASHER - 5/8" (A)               | 12  |
| 30               | 25665-01  | 99619   | AIR BAG PLATE - RIGHT                | 1   |
| 31               | 25143-01  | 99177   | AIR BAG PLATE - LEFT                 | 1   |
| 32               | 24971-01  | 99026   | BACKING PLATE                        | 2   |
| 33               | 25231-01  | 99244   | AXLE HANGER RESTRAINT STRAP          | 2   |
| 34               | T-1851    | 62158   | HEX BOLT 1/2-20UNF 2 GR. 8           | 8   |
| 35               | 17357-01  | 93281   | LOCKNUT - 1/2-20UNF GR. C (D)        | 14  |
| 36               | 0003-07   | 0003-XX | FLAT WASHER - 1/2 (A)                | 18  |
| 37               | 18841-01  | 62158   | HEX BOLT 3/8-16UNC 1 GR.5 (D)        | 4   |
| 38               | 21068-01  | 93282   | LOCKNUT - 3/8-16UNC GR.C             | 4   |
| 39               | 25761-01  | 99679   | AXLE BRIDGE                          | 1   |
| 40               | 21069-01  | 93403   | FLAT WASHER, 3/8                     | 4   |
| 41               | 16418-01  | 93281   | LOCKNUT - 1/2-13UNC GR.C (E,D)       | 6   |
| 42               | 25681-01  | 99196   | COMPRESSOR                           | 1   |
| 43               | 25610-01  | 99571   | STRAP SPACER                         | 2   |
| 44               | 17355-01  | 62158   | HEX BOLT 1/2-20UNF 3 1/4 GR. 8       | 4   |
| 45               | 25689-01  | 99630   | FLAT 1/2-13UNC 2 1/4 GR. 8           | 2   |
| 46               | 25690-01  | 99630   | FLAT 1/2-13UNC 1 3/4 GR. 8           | 2   |
| 47               | 25695-01  | 99630   | FLAT 1/2-13UNC 1 GR. 8 (D)           | 4   |
| 48               | 25666-01  | 99620   | COMPRESSOR SIDE COVER                | 1   |
| 49               | 25667-01  | 99621   | COMPRESSOR COVER                     | 1   |
| 50               | 12943-01  | 62158   | HEX BOLT 1/4-20UNC 3/4 GR.2          | 5   |
| 51               | 12912-01  | 99621   | LOCK NUT 1/4-20UNC GR.C              | 5   |
| 52               | 12913-01  | 93403   | FLAT WASHER, 1/4"                    | 5   |
| 53               | 19354-33  | 97386   | HCV-LINKAGE                          | 1   |
| 54               | 22844-02  | 79189   | CONTROL VALVE - 12V                  | 1   |
| 55               | 25162-01  | 62158   | CAP SCREW #10-32UNF                  | 2   |
| 56               | 25161-01  | 98085   | LOCK WASHER - #10                    | 2   |
| 57               | 25722-01  | 99654   | HCV - CONTROL ARM                    | 1   |
| 58               | 25624-01  | 99585   | FRAME SPACER                         | 1   |
| 59               | 25621-01  | 99582   | TRACK ROD BOTTOM PLATE               | 1   |
| 60               | 25784-01  | 99784   | U-BOLT, 5/8-18UNF X 7" GR. 8         | 2   |
| 61               | 24945-01  | 99002   | FRONT HGR 1" ALIGNMENT BUSHING (D,C) | 2   |
| 62               | 0001-07   | 0001-XX | 7/8-14UNF X 5 GR 5 (C)               | 2   |
| 63               | 25686-01  | 62158   | HEX BOLT 1/2-20UNF 1 1/4 GR. 8 (D)   | 2   |



## Bill of Material - 99655/F450

| BILL OF MATERIAL |           |         |                                       |     |
|------------------|-----------|---------|---------------------------------------|-----|
| ITEM             | PART NO.  | DWG NO. | DESCRIPTION                           | QTY |
| 1                | 25192-01  | 99210   | FRONT HANGER W/ RAIL - LEFT           | 1   |
| 2                | 25805-01  | 99211   | FRONT HANGER W/ RAIL - RIGHT          | 1   |
| 3                | 25220-01  | 99239   | AIR SPRING                            | 2   |
| 4                | 25221-01  | 99240   | TORQUE ARM - FIXED                    | 2   |
| 5                | 1035-1575 | 1035-XX | TORQUE ARM - ADJUSTABLE               | 2   |
| 6                | 25698-01  | 99634   | AXLE HANGER - LEFT                    | 1   |
| 7                | 25699-01  | 99635   | AXLE HANGER - RIGHT                   | 1   |
| 8                | 25730-01  | 99680   | AXLE CLAMP - LEFT                     | 1   |
| 9                | 25734-01  | 99664   | AXLE CLAMP - RIGHT                    | 1   |
| 10               | 1035-17   | 1035-XX | TRACK ROD - ADJUSTABLE                | 1   |
| 11               | 20005-01  | 62158   | HEX BOLT 7/8-14UNF X 4 1/2 GR 5       | 2   |
| 12               | 18632-01  | 62158   | HEX BOLT, 1-8UNC X 6 GR 5             | 4   |
| 13               | 25687-01  | 93281   | LOCK NUT, 1-8UNC GR C                 | 4   |
| 14               | T-5770    | 93403   | FLAT WASHER, 1"                       | 6   |
| 15               | 17637-01  | 62158   | HEX BOLT 7/8-9UNC 5 GR. 5             | 2   |
| 16               | 10092-01  | 93281   | LOCK NUT, 7/8-9UNC 2B                 | 2   |
| 17               | T7292     | 71078   | WASHER, FLAT 7/8                      | 4   |
| 18               | 25684-01  | 99629   | TRACK ROD BRACKET ASSEMBLY            | 1   |
| 19               | 12920-01  | 93280   | NUT - 1/2"                            | 2   |
| 20               | T-1705    | 62159   | LOCKWASHER - 1/2"                     | 2   |
| 21               | 08211-01  | 93280   | NUT - 3/4"                            | 2   |
| 22               | T-3164    | 62159   | LOCKWASHER - 3/4"                     | 2   |
| 23               | 25219-01  | 99238   | SWAY BAR                              | 1   |
| 24               | 22008-05  | 95180   | HCV HADLEY 500 - 1/4 NPT FITTING      | 1   |
| 25               | 25680-01  | 62158   | HEX BOLT 1/4-20UNC-2A 3 GR. 5         | 2   |
| 26               | 22951-01  | 93281   | LOCKNUT 1/4-20UNC-2B GR. C            | 2   |
| 27               | 25688-01  | 62158   | HEX BOLT 5/8-18UNF 8 1/2 GR 8         | 8   |
| 28               | 12893-01  | 93282   | LOCKNUT - 5/8-18UNF GR. C (A)         | 12  |
| 29               | 23148-01  | 93403   | FLAT WASHER - 5/8" (A)                | 12  |
| 30               | 25665-01  | 99619   | AIR BAG PLATE - RIGHT                 | 1   |
| 31               | 25143-01  | 99177   | AIR BAG PLATE - LEFT                  | 1   |
| 32               | 24971-01  | 99026   | BACKING PLATE                         | 2   |
| 33               | 25231-01  | 99244   | AXLE HANGER RESTRAINT STRAP           | 2   |
| 34               | T-1851    | 62158   | HEX BOLT 1/2-20UNF 2 GR. 8            | 8   |
| 35               | 17357-01  | 93281   | LOCKNUT - 1/2-20UNF GR. C (D)         | 14  |
| 36               | 0003-07   | 0003-XX | FLAT WASHER - 1/2 (A)                 | 18  |
| 37               | 18841-01  | 62158   | HEX BOLT 3/8-16UNC 1 GR.5 (D)         | 4   |
| 38               | 21068-01  | 93282   | LOCKNUT - 3/8-16UNC GR.C              | 4   |
| 39               | 25761-01  | 99679   | AXLE BRIDGE                           | 1   |
| 40               | 21069-01  | 93403   | FLAT WASHER, 3/8                      | 4   |
| 41               | 16418-01  | 93281   | LOCKNUT - 1/2-13UNC GR.C (E)(D)       | 6   |
| 42               | 25681-01  | 99196   | COMPRESSOR                            | 1   |
| 43               | 25610-01  | 99571   | STRAP SPACER                          | 2   |
| 44               | 17355-01  | 62158   | HEX BOLT 1/2-20UNF 3 1/4 GR. 8        | 4   |
| 45               | 25689-01  | 99630   | FLAT 1/2-13UNC 2 1/4 GR. 8            | 2   |
| 46               | 25690-01  | 99630   | FLAT 1/2-13UNC 1 3/4 GR. 8            | 2   |
| 47               | 25695-01  | 99630   | FLAT 1/2-13UNC 1 GR. 8 (D)            | 4   |
| 48               | 25666-01  | 99620   | COMPRESSOR SIDE COVER                 | 1   |
| 49               | 25667-01  | 99621   | COMPRESSOR COVER                      | 1   |
| 50               | 12943-01  | 62158   | HEX BOLT 1/4-20UNC 3/4 GR.2           | 5   |
| 51               | 12912-01  | 99621   | LOCK NUT 1/4-20UNC GR.C               | 5   |
| 52               | 12913-01  | 93403   | FLAT WASHER, 1/4"                     | 5   |
| 53               | 19354-33  | 97386   | HCV-LINKAGE                           | 1   |
| 54               | 22844-02  | 79189   | CONTROL VALVE - 12V                   | 1   |
| 55               | 25162-01  | 62158   | CAP SCREW #10-32UNF                   | 2   |
| 56               | 25161-01  | 98085   | LOCK WASHER - #10                     | 2   |
| 57               | 25722-01  | 99654   | HCV - CONTROL ARM                     | 1   |
| 58               | 25624-01  | 99585   | FRAME SPACER                          | 1   |
| 59               | 25621-01  | 99582   | TRACK ROD BOTTOM PLATE                | 1   |
| 60               | 25784-01  | 99784   | U-BOLT, 5/8-18UNF X 7" GR. 8          | 2   |
| 61               | 24945-01  | 99002   | FRONT HGR 1" ALIGNMENT BUSHING (D)(C) | 2   |
| 62               | 0001-07   | 0001-XX | 7/8-14UNF X 5 GR 5 (C)                | 2   |
| 63               | 25686-01  | 62158   | HEX BOLT 1/2-20UNF 1 1/4 GR. 8 (D)    | 2   |

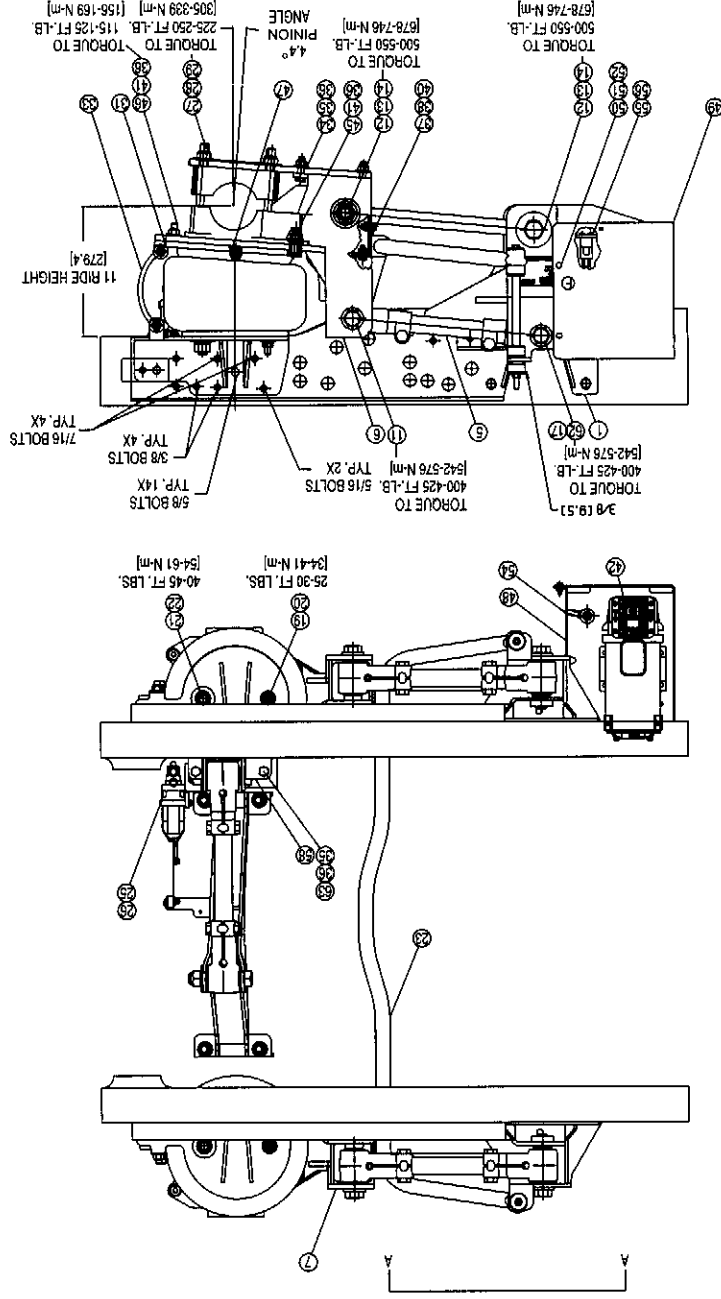
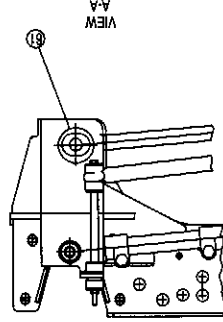
## Drive Axle Air-Ride Suspension System



- NOTES:
1. SUSPENSION KATINGS: GROUND LOAD (GAWM) 11,000 LBS.
  2. STANDARD KATING TRAVEL IS 2.5" UP AND 3.5" DOWN  
AXLE AND W/TH RESPECT TO THE FRAME RAIL
  3. SHOCK UNITS LEFT OUT FOR CLARITY
  4. FRAME ATTACHMENT FASTENERS SUPPLIED BY THE CUSTOMER  
AND ARE TO BE SEE GRADE 5 MINIMUM
  5. WEIGHT OF SUSPENSION WITHOUT FASTENERS IS (TBD) LB  
WEIGHT OF SUSPENSION COMPLETE IS APPROXIMATELY (TBD) LB

| REV | DESCRIPTION                                     | DATE       | BY |
|-----|-------------------------------------------------|------------|----|
| A   | RELEASED                                        | 06-19-1998 | NM |
| B   | ITEM 36 TO 18                                   | 06-24-1998 | NM |
| C   | CHANGED QTY. OF ITEMS 28 & 29 TO 12 AND QTY. OF | 06-02-1998 | NM |
| D   | PICTORIAL UPDATED                               | 09-22-1999 | NM |
| E   | AND CHANGE ITEM 17 TO QTY. OF 4                 |            |    |
| F   | ADDED PN 2545-01 AND PN 0001-07                 |            |    |
| G   | TO 24 AND PN 2566-01 CHANGED TO 10              |            |    |
| H   | 1753-01 CHANGED TO 22 & 0003-07 CHANGED         |            |    |
| I   | PN 1641-01 & 2565-01 CHANGED TO 4 AND PN        |            |    |
| J   | PN 2445-01 QTY. CHANGED FROM 1 TO 2 ALSO        |            |    |
| K   | CHANGE 1641-01 TO QTY. OF 6                     |            |    |
| L   | UPDATE PICTORIAL                                | 05-23-2000 | NM |
| M   |                                                 | 11-05-1999 | NM |
| N   |                                                 | 05-06-1999 | NM |
| O   |                                                 | 11-05-1999 | NM |
| P   |                                                 | 11-07-1999 | NM |

|                                                                                                                                                                                                           |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| THIS DRAWING IS THE PROPERTY OF TUTHILL CORPORATION, AND IS NOT TO BE USED<br>IN ANY MANNER DETRIMENTAL TO ITS INTERESTS. THIS DRAWING IS SUBJECT TO<br>PRINTED OR OTHERWISE, ARE UNCONTROLLED DOCUMENTS. |  |
| UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE TO BE IN INCHES, UNLESS<br>OTHERWISE SPECIFIED.                                                                                                            |  |
| TOLERANCES UNLESS OTHERWISE SPECIFIED:<br>3 PLACE DECIMAL: .010 (0.25mm)<br>2 PLACE DECIMAL: .001 (0.025mm)<br>1 PLACE DECIMAL: .005 (0.127mm)                                                            |  |
| ANGLE: ± 1 DEGREE                                                                                                                                                                                         |  |
| TITLE:                                                                                                                                                                                                    |  |
| F450 SUSPENSION                                                                                                                                                                                           |  |
| MODEL:                                                                                                                                                                                                    |  |
| 345P                                                                                                                                                                                                      |  |
| SCALE: N/A                                                                                                                                                                                                |  |
| DRAWING NUMBER:                                                                                                                                                                                           |  |
| 996555                                                                                                                                                                                                    |  |



## Bill of Material - 99212/F550

| BILL OF MATERIAL |           |          |                              |      | BILL OF MATERIAL (CONTINUED) |           |          |                                 |      |
|------------------|-----------|----------|------------------------------|------|------------------------------|-----------|----------|---------------------------------|------|
| ITEM             | PART NO.  | DWG. NO. | DESCRIPTION                  | QTY. | ITEM                         | PART NO.  | DWG. NO. | DESCRIPTION                     | QTY. |
| 1                | 25192-01  | 99210    | LEFT STIFFENER ASSEMBLY      | 1    | 44                           | 25612-01  | 99573    | LEFT FRONT CLAMP BRACKET        | 2    |
| 2                | NA        | NA       | M14X2 BOLT                   | 8    | 45                           | 25612-02  | 99573    | LEFT REAR CLAMP BRACKET         | 2    |
| 3                | NA        | NA       | M14X2 NUT                    | 12   | 46                           | 25607-01  | 99568    | CLAMP SPACER                    | 2    |
| 4                | 700147-01 | 700147   | M14X2 X 65 CLASS 10.9.3 BOLT | 4    | 47                           | 17054-01  | 62158#2  | 1/2-13 X 6 1/2 GRADE 8 BOLT     | 2    |
| 5                | 23090-01  | 62158#4  | 5/8-18 X 2 GRADE 8 BOLT      | 2    | 48                           | 1035-17   | 1035-XX  | 17 INCH ADJUSTABLE TRACK ROD    | 1    |
| 6                | 23148-01  | 93403#2  | 5/8 HARDENED WASHER          | 14   | 49                           | 17637-01  | 62158#3  | 7/8-9 X 5 GRADE 5 BOLT          | 2    |
| 7                | 0002-11   | 93281    | 5/8-18 GRADE C LOCK NUT      | 12   | 50                           | 10092-01  | 93281    | 7/8-9 GRADE C LOCK NUT          | 2    |
| 8                | 24971-01  | 99026    | T.A.S.S. BACKING PLATE       | 2    | 51                           | 25220-01  | 79167#3  | IT15L-2 AIR SPRING              | 2    |
| 9                | 23366-01  | 62158#4  | 5/8-18 X 2 1/2 GRADE 8 BOLT  | 2    | 52                           | 25143-01  | 99177    | LEFT AIR SPRING MOUNTING PLATE  | 1    |
| 10               | 17353-01  | 62158#3  | 1/2-20 X 2 1/2 GRADE 8 BOLT  | 4    | 53                           | 25665-01  | 99619    | RIGHT AIR SPRING MOUNTING PLATE | 1    |
| 11               | 10016-01  | 93403#2  | 1/2 HARDENED WASHER          | 32   | 54                           | 25689-01  | 99630    | 1/2-13 X 2 1/4 FLAT HEAD BOLT   | 2    |
| 12               | 17357-01  | 93281    | 1/2-20 GRADE C LOCK NUT      | 24   | 55                           | 25690-01  | 99630    | 1/2-13 X 1 3/4 FLAT HEAD BOLT   | 2    |
| 13               | 702003-01 | 702003   | TRACK ROD HANGER BOTTOM ASSY | 1    | 56                           | T-3164    | 62159    | 3/4 LOCK WASHER                 | 2    |
| 14               | 700144-02 | 700144   | 7/16-20 X 2 GRADE 8 BOLT     | 4    | 57                           | 08211-01  | 93280    | 3/4-16 GRADE B NUT              | 2    |
| 15               | 700146-01 | 700146   | 7/16 HARDENED WASHER         | 16   | 58                           | T-1705    | 62159    | 1/2 LOCK WASHER                 | 2    |
| 16               | 0002-04   | 93281    | 7/16-20 GRADE C LOCK NUT     | 8    | 59                           | 12920-01  | 93280    | 1/2-13 GRADE C NUT              | 2    |
| 17               | 25624-01  | 99585    | TRACK ROD HANGER TOP BRACKET | 1    | 60                           | 25231-01  | 99244    | AXLE RESTRAINT STRAP            | 2    |
| 18               | 700144-03 | 700144   | 5/16-18 X 1 3/4 GRADE 5 BOLT | 1    | 61                           | 25610-01  | 99571    | TOP RESTRAINT STRAP INSERT      | 2    |
| 19               | 25166-01  | 93403#2  | 5/16 HARDENED WASHER         | 16   | 62                           | 701220-02 | 701220   | RESTRAINT STRAP SPACER          | 2    |
| 20               | 16417-01  | 93281    | 5/16-18 GRADE C LOCK NUT     | 6    | 63                           | 17355-01  | 62158#3  | 1/2-20 X 3 1/4 GRADE 8 BOLT     | 2    |
| 21               | 25805-01  | 99211    | RIGHT STIFFENER ASSEMBLY     | 1    | 64                           | 701220-03 | 701220   | BOTTOM RESTRAINT STRAP INSERT   | 2    |
| 22               | 700144-01 | 700144   | 7/16-20 X 1 3/4 GRADE 8 BOLT | 4    | 65                           | 701572-01 | 701572   | HEAT SHIELD                     | 1    |
| 23               | 25165-01  | 62158#5  | 5/16-18 1 1/2 GRADE 5 BOLT   | 1    | 66                           | 25219-01  | 99238    | ANTI-ROLL BAR ASSEMBLY          | 1    |
| 24               | 25684-01  | 99629    | TRACK ROD HANGER ASSEMBLY    | 1    | 67                           | 18841-01  | 62158#3  | 3/8-16 X 1 GRADE 5 BOLT         | 4    |
| 25               | 25696-01  | 99630    | 1/2-13 X 1 FLAT HEAD BOLT    | 6    | 68                           | 21069-01  | 93403#1  | 3/8 SOFT WASHER                 | 4    |
| 26               | 16418-01  | 93281    | 1/2-13 GRADE C LOCK NUT      | 6    | 69                           | 21068-01  | 93282    | 3/8-16 GRADE C LOCK NUT         | 4    |
| 27               | 25686-01  | 62158#5  | 1/2-20 X 1 1/4 GRADE 8 BOLT  | 10   | 70                           | 22008-05  | 95180#3  | HADLEY ADJ HCV W/O ARM          | 1    |
| 28               | 25221-01  | 99240    | 16 INCH FIXED TORQUE ARM     | 2    | 71                           | 25680-01  | 62158#5  | 1/4-20 X 3 GRADE 5 BOLT         | 2    |
| 29               | 18632-01  | 62158#3  | 1-8 X 6 GRADE 5 BOLT         | 4    | 72                           | 12912-01  | 93282    | 1/4-20 GRADE C LOCK NUT         | 7    |
| 30               | T-5770    | 93403#2  | 1 INCH HARDENED WASHER       | 6    | 73                           | 25722-01  | 99654    | OFFSET HCV CONTORL ARM          | 1    |
| 31               | 25687-01  | 93281    | 1-8 GRADE C LOCK NUT         | 4    | 74                           | 19354-33  | 97386#3  | SHORTENABLE VERTICAL HCV LINK   | 1    |
| 32               | 24945-01  | 99002    | 1 INCH ALIGNMENT BUSHING     | 2    | 75                           | 25681-01  | 99196    | THOMAS 1/3 HP AIR COMPRESSOR    | 1    |
| 33               | 1035-1575 | 1035-XX  | 15 3/4 ADJUSTABLE TORQUE ARM | 2    | 76                           | 17589-01  | 62158#3  | 5/16-18 X 2 1/4 GRADE 5 BOLT    | 4    |
| 34               | 0001-07   | 0001-XX  | 7/8-14 X 5 GRADE 5 BOLT      | 2    | 77                           | 25264-01  | 99272    | MALE VIBRATION ISOLATOR         | 4    |
| 35               | T-7292    | 93403#2  | 7/8 HARDENED WASHER          | 6    | 78                           | 25264-02  | 99272    | FEMALE VIBRATION ISOLATOR       | 4    |
| 36               | 24951-01  | 99008    | LEFT AXLE HANGER             | 1    | 79                           | 22368-01  | 93280    | 5/16-18 GRADE B HEX NUT         | 4    |
| 37               | 20005-01  | 62158#3  | 7/8-14 X 4 1/2 GRADE 5 BOLT  | 2    | 80                           | 22844-02  | 79189#3  | 12V SOLENOID AIR VALVE          | 1    |
| 38               | 25688-01  | 62158#5  | 5/8-18 X 8 1/2 GRADE 8 BOLT  | 8    | 81                           | 25162-01  | 62158#5  | #10-32 X 1/2 GRADE 5 BOLT       | 2    |
| 39               | 25194-01  | 99213    | LEFT AXLE CLAMP              | 1    | 82                           | 25161-01  | 98085#2  | #10 INTERNAL TOOTH LOCK WASHER  | 2    |
| 40               | T-1851    | 62158#1  | 1/2-20 X 2 GRADE 8 BOLT      | 8    | 83                           | 25666-01  | 99620    | REAR COMPRESSOR COVER           | 1    |
| 41               | 25806-01  | 99209    | RIGHT AXLE HANGER            | 1    | 84                           | 12943-01  | 62158#2  | 1/4-20 X 3/4 GRADE 2 BOLT       | 5    |
| 42               | 25807-01  | 99214    | RIGHT AXLE CLAMP             | 1    | 85                           | 12913-01  | 93403#1  | 1/4 SOFT WASHER                 | 5    |
| 43               | 25683-01  | 99628    | AXLE BRIDGE                  | 1    | 86                           | 25667-01  | 99621    | FRONT COMPRESSOR COVER          | 1    |



# Bill of Material - 700224/Air System

Maintenance Procedures Model 345P

AND 79AR

## BILL OF MATERIAL

| ITEM | PART NO.  | DWG. NO. | DESCRIPTION                         | QTY. |
|------|-----------|----------|-------------------------------------|------|
| 1    | 12936-11  | 83014    | 1/4 NPT MALE TO 1/4 DOT ELBOW       | 6    |
| 2    | 25681-01  | 99196    | 12V COMPRESSOR                      | 1    |
| 3    | 17589-01  | 62158#3  | 5/16-18 X 2 1/4 GRADE 5 BOLT        | 4    |
| 4    | 25264-01  | 99272    | MALE VIBRATION ISOLATOR             | 4    |
| 5    | 25264-02  | 99272    | FEMALE VIBRATION ISOLATOR           | 4    |
| 6    | 25166-01  | 93403#2  | 5/16 HARDENED WASHER                | 12   |
| 7    | 22368-01  | 93280    | 5/16-18 GRADE B NUT (C)             | 4    |
| 8    | 16417-01  | 93281    | 5/16-18 GRADE C LOCK NUT            | 4    |
| 9    | 12936-26  | 83014    | 1/4 NPT 3X FEMALE TEE               | 1    |
| 10   | 12936-02  | 83014    | 1/4 NPT MALE TO 3/8 DOT ELBOW (C)   | 2    |
| 11   | 12936-08  | 83014    | 1/4 NPT STREET TEE                  | 4    |
| 12   | 12936-17  | 83014    | 1/4 NPT MALE TO 1/4 DOT FTG         | 4    |
| 13   | 22844-02  | 79189    | 12V DUMP SOLENOID VALVE             | 1    |
| 14   | 25162-01  | 62158#5  | #10-32 X 1/2 GRADE 5 BOLT           | 2    |
| 15   | 25161-01  | 98085#2  | #10 INTERNAL TOOTH LOCK WASHER      | 2    |
| 16   | 12936-03  | 83014    | 1/8 NPT MALE TO 1/4 DOT ELBOW       | 2    |
| 17   | 22008-05  | 95180#3  | HADLEY 500 HEIGHT CONTROL VALVE     | 1    |
| 18   | 25680-01  | 62158#5  | 1/4-20 X 3 GRADE 5 BOLT             | 2    |
| 19   | 22951-01  | 93281    | 1/4-20 GRADE C LOCK NUT             | 2    |
| 20   | 25722-01  | 99654    | HEIGHT CONTROL VALVE ARM            | 1    |
| 21   | 19354-33  | 97386#3  | HADLEY MODIFIABLE HCV LINK KIT      | 1    |
| 22   | 12936-19  | 83014    | 1/8 NPT MALE TO 1/4 DOT FTG         | 1    |
| 23   | 25172-01  | 99197#2  | AIR TANK - 24 3/8 LONG 1/4 NPT      | 1    |
| 24   | 12936-27  | 83014    | 3/8NPT MALE - 1/4NPT FEMALE FTG (C) | 2    |
| 25   | 25173-01  | 99198    | 1/4 NPT MALE DRAIN VALVE            | 1    |
| 26   | 700776-01 | 700776   | AIR TANK FRONT BRACKET (5)          | 1    |
| 27   | 700777-01 | 700777   | AIR TANK BRACKET ASSEMBLY (5)       | 1    |
| 28   | 700778-01 | 700778   | GAUGE AND SWITCH MOUNTING PLATE     | 1    |
| 29   | 12936-10  | 83014    | 1/4 NPT FEMALE BULKHEAD FTG         | 2    |
| 30   | 25682-01  | 99199    | 1/4 NPT SEALED PRESSURE SWITCH      | 1    |
| 31   | 25175-01  | 99198    | 1/4 NPT PRESSURE GAUGE              | 1    |
| 32   | 25178-01  | 99199    | 12V COMPRESSOR SOLENOID SWITCH      | 1    |
| 33   | 25179-01  | 99199    | 12V 40 AMP CIRCUIT BREAKER          | 1    |
| 34   | NA        | NA       | 12V ROCKER SWITCH (6)               | 1    |
| 35   | 25181-01  | 99199    | 12V PILOT LIGHT                     | 1    |
| 36   | 25177-01  | 99199    | 12V LOW PRESSURE SWITCH             | 1    |



# Suspension Drawing - 700224/Air System

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------|----|
| 700224-01                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            | 700224                                         |    |
| DRAWING DATE: AUGUST 11, 2000                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | SCALE: 1/8" ON SIZE D                          |    |
| DRAWN BY: TMA33                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            | PART NUMBER                                    |    |
| TITLE: AIR SYSTEM DIAGRAM                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            | MODEL: 345P                                    |    |
| <p>THIS DRAWING IS THE PROPERTY OF TUTHILL CORPORATION, AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO ITS INTERESTS. THIS DRAWING IS SUBJECT TO RETURN UPON REQUEST. ALL COPIES OF THIS ELECTRONIC DOCUMENT, WHETHER ELECTRONIC, PRINTED, OR OTHERWISE, ARE UNCONTROLLED DOCUMENTS.</p> <p>TOLERANCES UNLESS OTHERWISE SPECIFIED:<br/>         FRACTIONAL: ±.005 (1/32")<br/>         DECIMAL: ±.005 (1/32")<br/>         HOLE: ±.005 (1/32")<br/>         HOLE: ±.005 (1/32")</p> |            |                                                |    |
| REV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DATE       | DESCRIPTION                                    | BY |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10-15-1999 | RELEASED FOR PRODUCTION                        | RM |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 08-24-2000 | REWORKING TO MATCH CURRENT CONSTRUCTION        | TH |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 08-24-2000 | ADDED CHECK VALVE AND TORQUE NOTES             | TH |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 08-24-2000 | WPT MADE TO VA DOT ELONG                       | TH |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 08-24-2000 | ADDED DETAIL A ITEM 7 & 24 AND ITEM 10 WAS 3/8 | TH |

- NOTES:
1. THIS DRAWING IS TO SHOW FUNCTIONAL PLUMBING AND WIRING.
  2. THIS DRAWING APPLIES TO FONTAINE 345P.
  3. THIS DRAWING APPLIES TO TX2517X, TX25262 AND TX25263.
  4. WIRING AND PLASTIC DOT AIR LINES ARE SUPPLIED BY CUSTOMER.
  5. ITEM 24 AND 25 ARE NOT SHOWN.
  6. ITEM 32 IS SUPPLIED BY CUSTOMER.

GENERAL NOTES, UNLESS OTHERWISE SPECIFIED:  
 NOTES IN BRACKETS [ ] ARE METRIC UNITS  
 CASTING REPAIRS TO BE MADE PER  
 ENG STD-001  
 SUB-CONTRACTOR TO CERTIFY MATERIAL  
 SPECIFICATIONS

12V DC  
 1/4 DOT AIR  
 3/8 DOT AIR

