



WLS350 Series Load Weighing System

*Basic Installation, Calibration and
Operating Instructions*

Important Safety Information

Precautionary Statements



Warning– Indicates a potentially hazardous situation which, if not avoided, could lead to serious injury or death.



Caution– Indicates a potentially hazardous situation which, if not avoided, could lead to a mild to moderate injury.



Information – Indicates important points that Operators and Installers need to fully understand.



Refer to Documentation – Indicates important points which must be obtained by referring to manufacturers Service, Operation, or Maintenance Manuals.

It is your sole responsibility to install, operate, and maintain the SCI system in a manner that will not cause damage to persons, property, or anything else. Always use safe practices and adhere to any laws that may be in place.

Do not install, operate, or maintain the SCI system unless you are completely competent and understand the system and equipment it is mounted on.

Read this manual completely prior to use and familiarize yourself with the components and locations.

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1. Introduction

The WLS350 Weighing Indicator is IP67 rated digital indicator designed for use on forklifts and small wheel loaders in temperatures between -40F – 185F degrees.

Operating Voltage is 8-32 Volts DC.

The WLS350 will generally be installed with a hydraulic pressure transducer mounted in the piston / ram side of the lift circuit cylinder. The hydraulic transducer should be mounted in an area that is not affected by high pressure cleaning. **DO NOT SPRAY HARDWARE WITH PRESSURE WASHERS.**

1.1. Components

Standard Components

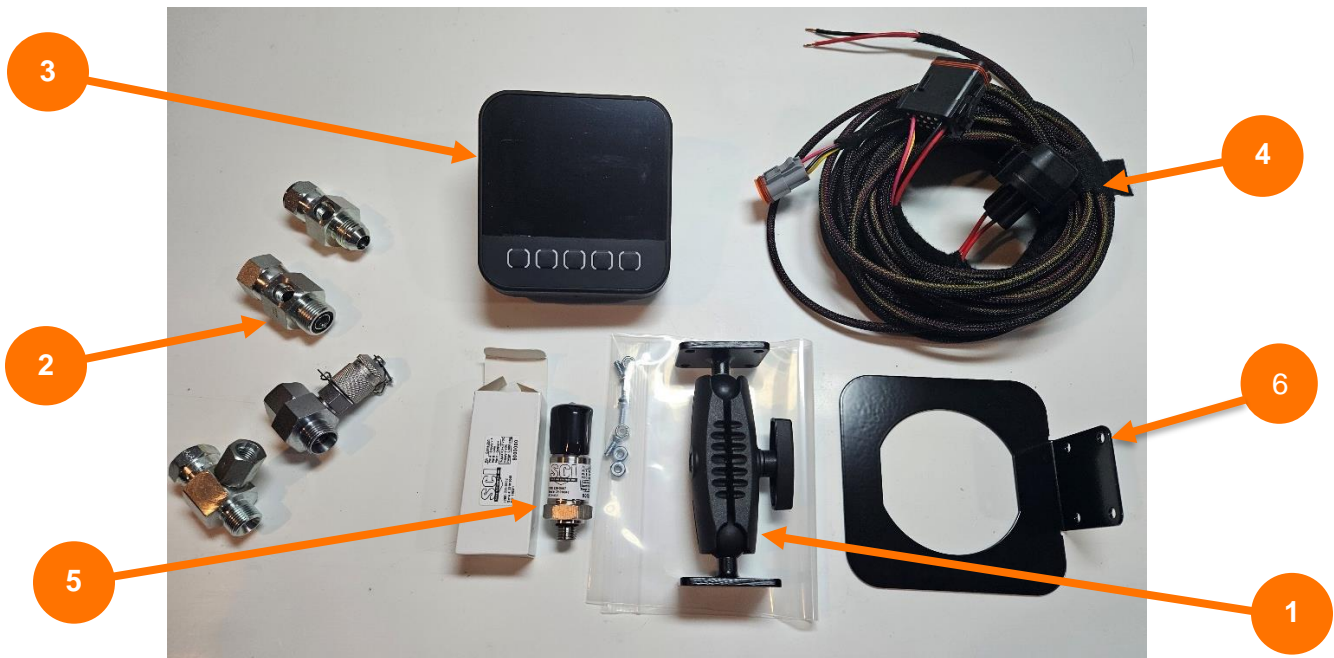


Figure 1

1. RAM Mount
2. Hydraulic Adapter – Customer Specified
3. Display
4. Wire Harness
5. Pressure Transducer
6. Mounting Bracket

2. Installation Procedure for the WLS350



WARNING: These basic installation instructions are given based on the installer having previous experience in the servicing and maintenance of machinery. General safety precautions should be undertaken similar to carrying out maintenance on this type of machinery. Inexperienced personnel should not undertake this task if they are unsure of the safety precautions necessary.

2.1. Fitting the Display to the Operators Cabin

Select a suitable location and using the mounting bracket, mount the display. Allow plenty of room for the cable at the rear of the display. A minimum of 3" should be provided between the display and any surface for adequate cable routing and connector removal.



DO NOT DRILL OR WELD ONTO ANY PORTION OF A R.O.P.S. or F.O.P.S.

A bracket, however, can be bolted onto a lock striker plate, window frame aperture or turret support. Consider wiring and cabling when choosing a mounting position. Consideration should also be given so the instrument does not impede operator vision. Vibration should also be taken into account so as not to damage the hardware.

2.2. Installing the Pressure Transducer



PRECAUTIONS

1. Lower Boom completely to the ground and stop the engine.
2. Operate the tilt, and lift levers to ensure no residual pressure is present in the hydraulic system. Refer to Owner's Manual to relieve pressure.
3. Remove the hydraulic tank filler cap to remove any pressure from the oil reservoir tank.
4. Slightly loosen any "easy to get at" fitting in the piston side of the lifting circuit to ensure no pressure is present. The transducer is to be fitted into the lifting circuit of the hydraulic system between the control valve and the lifting cylinders. See Appendix A for hydraulic information. Connect appropriate adapter to allow transducer to be mounted in a safe position. Avoid areas that are subject to oil and water. Do not run cable through articulated or moving areas of the machine. Tighten the fittings. Start the engine and lift the forklift / boom approx. 1/2" from the ground. Check for leaks. Bleed the air from the line by repeatedly raising and lowering the forks / boom.

2.3. Wiring the WLS350 to the Forklift or Loader

The WLS350 fits machines that have 8-32Vdc power supply. Voltages other than this may require a voltage converter.

RED = Switched supply. Can be tied to Ignition/Accessory or its own circuit to turn the system on.

BLACK = Ground

2.4. Establishing a Weighing Point

The WLS350 is a static scale. Because it uses hydraulic pressure from the lift cylinders to determine weight, a fixed point must be selected for accurate results. Recording weights from positions other than this fixed point, will provide inaccurate results. The weighing point on a standard forklift is usually about 3 feet above the ground. For a wheel loader, it is when the loader arms are approx. horizontal. Other positions can be selected, but that position must be used when weighing.

The weighing point is identified by either:

- A. Applying stickers to the mast or loader arms.
- B. Welding a pointer to the mast or loader arms identifying the position.
- C. Mark the loader arm pivot points so you align two paint marks.



When getting to the weighing point, it is preferred to have the last motion be in a downward direction to the weighing point. This motion will ensure the rod side pressure is eliminated and will not affect the weight values. For best results, slowly approach the position in an upward direction and overshoot slightly. Then slowly lower the boom until the weighing point is reached.

3. Settings Page

The Settings Page is accessed by pressing the gear symbol on the Home Page. Below is a list of parameters that can be changed. Refer to Figure 5.

“0 PSI” – Press to set the empty bucket pressure.

“KWN PSI” – Press to set the pressure of a known loaded bucket.

“KWN Load (lbs.)” - Press Increment or Decrement to set the known load amount.

“Units” – 4 units are available. LBS, KGS, TON, and MTON. 1 TON is equal to 2000lbs. 1 MTON is equal to 1000kg. 1kg is 2.206lbs.

“Increment” – Press to change the displayed increment value. Available options include 1lbs, 2lbs, 5lbs, 10lbs, 25lbs, 50lbs, 100lbs, 250lbs, 500lbs.

“Brightness” – press the Increment or Decrement buttons to adjust the display backlight level. Valid levels are 5 to 100 in steps of 5. Display and keys are changed at the same time.



4. Basic Calibration Instructions

The calibration instructions below are given based on a typical installation.

This system can be used in a large variety of applications, and changing the parameters that are set will greatly affect the performance of this scale.

1. Ensure you have an accurate test weight of approx. $\frac{1}{3}$ – $\frac{1}{2}$ of the machine capacity. The more accurate the test weight, the more accurate the scale. The test weight must fill the bucket like the material you will be weighing. Any protrusion of the test weight past the buckets cutting edge will greatly reduce accuracy.
2. Start the forklift or loader, and the WLS430 should also turn on. The indicator should power up and go through a short power up cycle. Once the power up cycle finishes, the indicator will show a random reading. To ensure you have the hydraulic pressure transducer fitted correctly, raising of the forks or bucket should result in the Current PSI on the Settings screen to rise.
3. Press the settings button (GEAR) on the bottom left-hand corner of the screen to enter the settings page (Figure 5).
4. Raise the empty Forks or Bucket to your weighing height. (Raise to 1, Lower to 2, Optional Decal) Allow approx. 2-3 seconds for the weight to settle, press cycle to make “Zero PSI” highlighted on the screen and press SET to set the Zero Weight Calibration Pressure.
5. Lower boom and place your test weight onto the forks or bucket. Do not lift to weighing height at this stage. Enter the test weight amount to “KWN WT” by pressing the Cycle button to highlight the KWN WT value then press Increment or Decrement to increase or decrease the value to match what is in the bucket.
6. It is now time to pick up the test weight and raise to the weighing height, (Raise to 1, Lower to 2, Optional Decal). Allow approx. 2-3 seconds for the weight to settle, and then press Cycle to highlight the KWN PSI value and then press SET to set the value.
7. Exit the settings page and check the “Displayed Weight” value to see if the weight displays the test weight amount. If not, you may need to repeat the calibration process.
8. Validate a lighter known load reads correctly. If correct, calibration is complete.

Perform as many test weighing until you are satisfied the system is working correctly.

If at any time the indicator indicates an error message during the calibration process, call tech support for assistance. Before calling check that the hydraulics have been installed into the correct ‘Piston / Ram’ circuit of the machine, and also check that your test weight is at least $\frac{1}{3}$ - $\frac{1}{2}$ machine capacity.

5. Basic Weighing

NOTE 1: All reference to weighing position refers to raising the forks or bucket up to a pre-determined position and lowering slightly and slowly.

The pre-determined position is determined by the installer and is generally indicated by stickers on the mast (Raise to 1, Lower to 2) and on the carriage.

(Arrow)

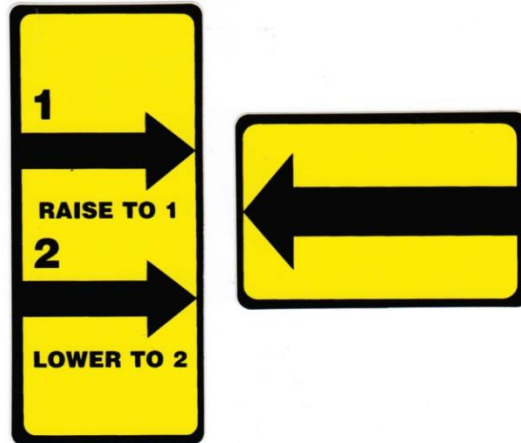


Figure 2

1. With the forks empty and mast vertical, raise forks up to the weighing position.
2. If other than 0.00 (zero) is displayed press ZERO key
3. Apply the load and raise up to the weighing position. The weight will vary as the load is raised and then lowered, but should stabilize within 2-3 seconds.
4. To Accumulate the weight once the weight has been obtained, Push the + Key (bottom right-hand corner) once. The Bucket Count and the Accumulated weight will be displayed. Repeat Step 3 to accumulate further buckets.
5. To CLEAR the TOTAL, press the "C" button (bottom mid-right corner) The TOTAL and Bucket Count will return to zero to allow the next Load to be completed.
6. NOTE: - Pushing the "LOAD" button will switch between LOAD A and LOAD B.

6. Home Page Layout

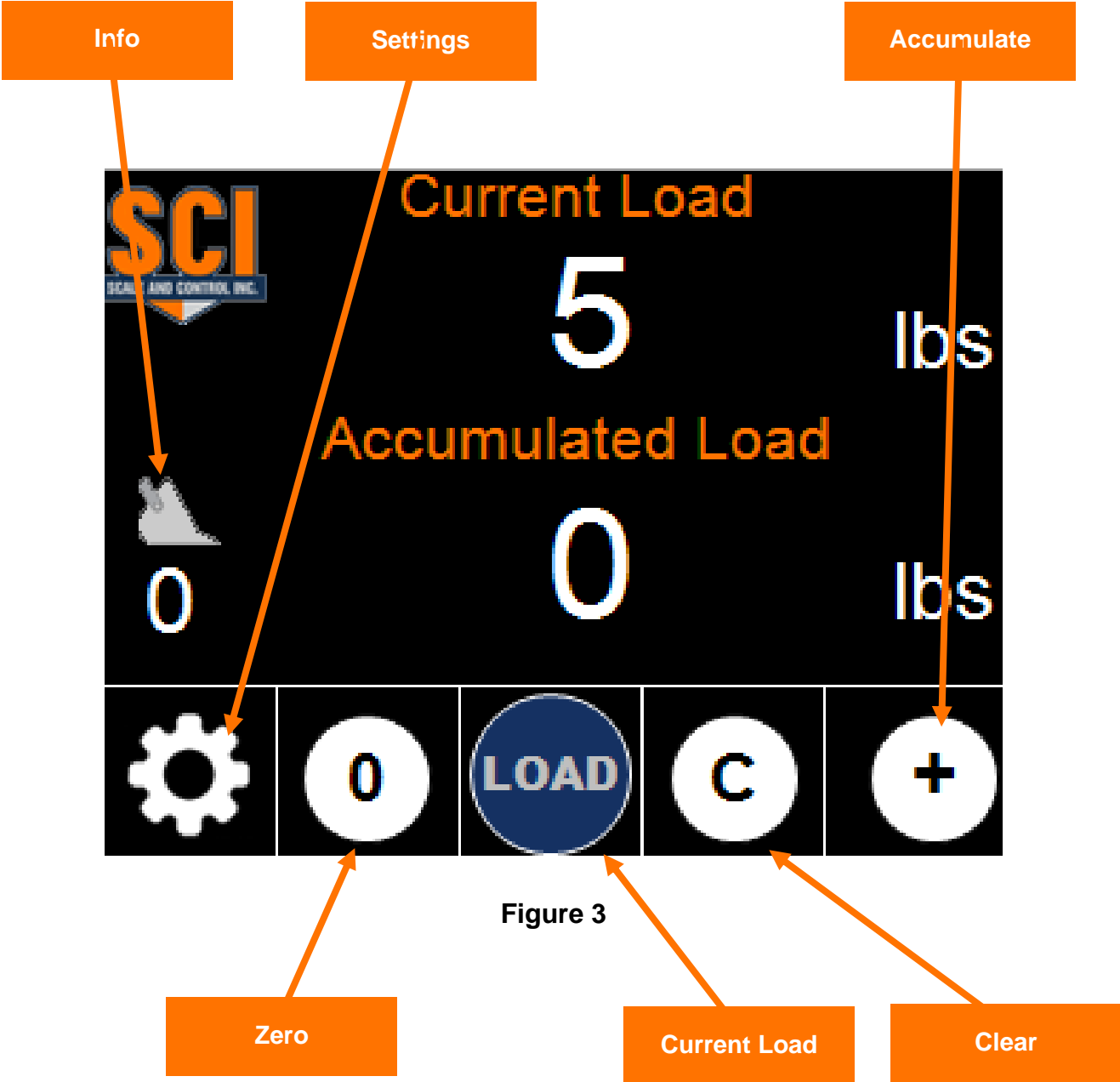


Figure 3

7. Settings Page Layout

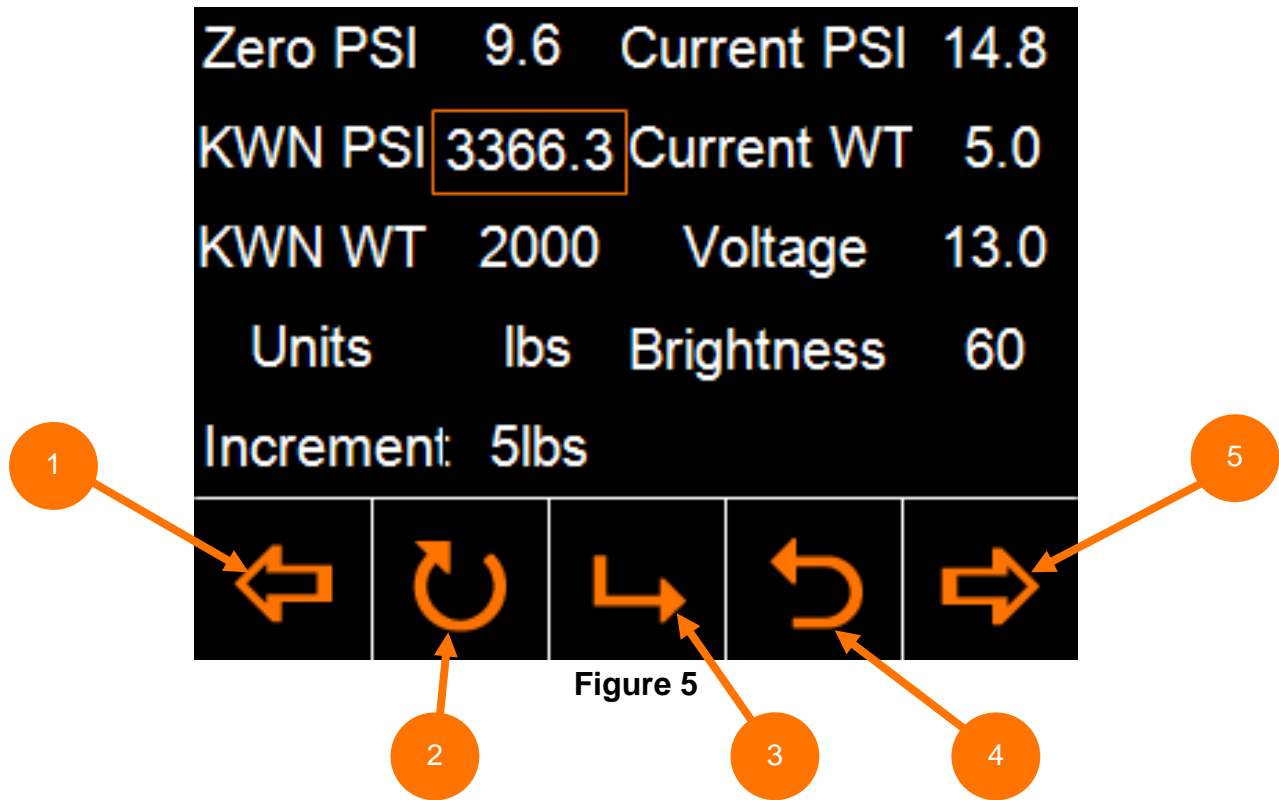
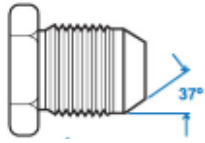
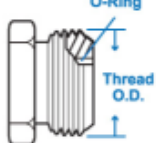
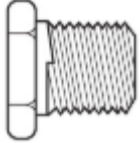
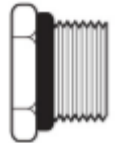


Figure 5

1. Decrement / Previous Value – Lowers selected value or changes to previous value
2. Cycle Setting – Moves the Selection Box in a cycle around the settings page
3. Set / Enter – Sets Pressures
4. Return to Home – Press to leave Settings Page
5. Increment / Next Value – Increases selected value or changes to next value

Appendix A – Hydraulics

Adapter Size Identification Chart

Size	JIC Thread	JIC Wrench	ORS Thread	ORS Wrench	Pipe Thread	Pipe Wrench	ORB Thread	ORB Wrench
								
-04	7/16-20	9/16	9/16-18	11/16	1/4-18	11/16	7/16-20	9/16
-06	9/16-18	11/16	11/16-16	13/16	3/8-18	7/8	9/16-18	11/16
-08	3/4-16	7/8	13/16-16	15/16	1/2-14	1	3/4-16	7/8
-10	7/8-14	1	1-14	1 1/4			7/8-14	1
-12	1 1/16-12	1 1/4	1 3/16-12	1 3/8	3/4-14	1 1/4	1 1/16-12	1 1/4
-16	1 5/16-12	1 1/2	1 7/16-12	1 5/8	1-11 1/2	1 1/2	1 5/16-12	1 1/2
-20	1 5/8-12	2	1 11/16-12	1 7/8	1 1/4-11 1/2	1 7/8	1 5/8-12	2

Proper tightening techniques

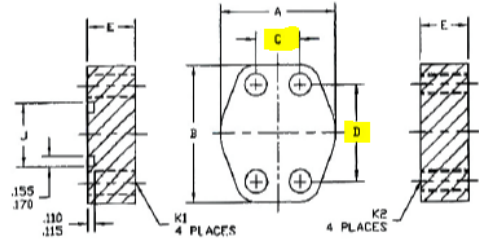
Using proper tightening techniques is important to keep the environment clean and prevent costly repairs and maintenance on hydraulic equipment. Here, <http://blog.parker.com/turn-vs-torque-how-making-the-right-choice-keeps-your-hydraulic-fitting-connections-leak-free>, you will find valuable information on proper installation and tightening of adapters. Here, <http://blog.parker.com/10-things-not-to-do-when-your-hydraulic-fitting-leaks>, is additional information on how to prevent leaks.

Key points for working on hydraulic systems

1. Do not use Teflon Tape on hydraulic systems. The tape can break free and move through the system and get caught in valve spools and pumps causing damage.
2. Use two wrenches when tightening adapters and hoses. One wrench holds the hose or adapter and the other tightens the nut.
3. LOTO – Lock Out Tag Out. Hydraulic systems are dangerous to work on and proper training should be obtained before maintaining or modifying any connections. Preventing someone from operating while working on the system is imperative.
4. Hydraulic fluid under pressure can kill. Know what you are doing and read the manufacturer’s manuals completely.

Code 61 Flange Dimensions

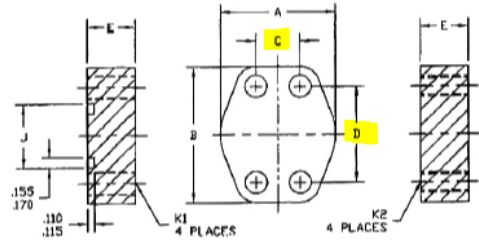
PLUG BLOCK - CODE 61 (O-RING FACE)



PART NO.	Flange Size	A	B	C	D	E	J Min	J Max	K1 Drill	K2 Thread
1942-61-08	1/2	1.813	2.125	0.688	1.500	0.750	1.000	1.005	0.344	5/16-18
1942-61-12	3/4	2.063	2.563	0.875	1.875	0.750	1.250	1.255	0.406	3/8-16
1942-61-16	1	2.313	2.750	1.031	2.063	0.880	1.560	1.565	0.406	3/8-16
1942-61-20	1-1/4	2.875	3.125	1.188	2.313	0.940	1.750	1.755	0.469	7/16-14
1942-61-24	1-1/2	3.250	3.688	1.406	2.750	1.190	2.115	2.125	0.531	1/2-13
1942-61-32	2	3.813	4.000	1.688	3.063	1.440	2.490	2.500	0.531	1/2-13
1942-61-40	2-1/2	4.281	4.500	2.000	3.500	1.820	2.995	3.005	0.531	1/2-13
1942-61-48	3	5.156	5.313	2.438	4.188	2.190	3.615	3.625	0.656	5/8-11

Code 62 Flange Dimensions

PLUG BLOCK - CODE 62 (O-RING FACE)



PART NO.	Flange Size	A	B	C	D	E	J Min	J Max	K1 Drill	K2 Thread
1942-62-12	3/4	2.500	2.950	0.937	2.000	1.250	1.245	1.255	0.406	3/8-16
1942-62-16	1	2.750	3.190	1.093	2.250	1.500	1.560	1.565	0.469	7/16-14
1942-62-20	1-1/4	3.060	3.750	1.250	2.625	1.500	1.750	1.755	0.531	1/2-13
1942-62-24	1-1/2	3.750	4.440	1.437	3.125	1.820	2.115	2.125	0.656	5/8-11
1942-62-32	2	4.500	5.250	1.750	3.812	1.750	2.490	2.500	0.781	3/4-10



Flange, JIC, flat face O-ring

Dash Size (Nominal Size)	Thread Pitch	Male Thread O.D. mm	Male Thread O.D. inches	Female Thread I.D. mm	Female Thread I.D. inches
-02 (1/8)	28	9.7	0.38	8.9	0.35
-04 (1/4)	19	13.2	0.52	11.9	0.47
-06 (3/8)	19	16.5	0.65	15.2	0.60
-08 (1/2)	14	20.8	0.82	19.1	0.75
-10 (5/8)	14	22.4	0.88	20.3	0.80
-12 (3/4)	14	26.4	1.04	24.6	0.97
-16 (1)	11	33.0	1.30	31.0	1.22
-20 (1 1/4)	11	41.9	1.65	39.6	1.56
-24 (1 1/2)	11	47.8	1.88	45.5	1.79
-32 (2)	11	59.7	2.35	57.4	2.26

BSPB Chart

Metric Tube Compression (DIN 2353 24° Cone)

The male connector has a 24° Cone with a straight thread, while the three female connectors have straight threads with a sealing surface. The seal forms between the cone on the male and the sealing areas on the females.

Fittings are available in two categories: DIN 2353 L (light) and DIN 2353 S (heavy) classes. Each has its own tube sizes and thread dimensions as shown in the following table:

DIN 2353 L Tube O.D. (mm)	DIN 2353 S Tube O.D. (mm)	Metric Thread Size	Male Thread O.D. (mm)	Female Thread I.D. (mm)
6		M12 x 1.5	12	10.5
8	6	M14 x 1.5	14	12.5
10	8	M16 x 1.5	16	14.5
12	10	M18 x 1.5	18	16.5
	12	M20 x 1.5	20	18.5
15	14	M22 x 1.5	22	20.5
	16	M24 x 1.5	24	22.5
18		M26 x 1.5	26	24.5
22	20	M30 x 2.0	30	28
28	25	M36 x 2.0	36	34
	30	M42 x 2.0	42	40
35		M45 x 2.0	45	43
42	38	M52 x 2.0	52	50

DIN Chart

NOTES





Contact us today!

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